Using machine learning to assess the predictive capabilities of fetal cardiotocography with reference to the time of the measurement relative to time of birth

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***Abstract*—Background: cardiotocography (CTG) has long been used in clinical decision making to help assess the fetus' condition during pregnancy. However it's usefulness in the detection of fetal acidosis is debated due to high inter and intraobserver variability and general difficulty in interpreting the signals. The introduction of automatic analysis methods aims to decrease these issues originating from human limitations, but additional questions still remain. There is no clear concession when is it most useful to perform CTG measurements and which time periods posses the highest predictive capabilities.**

Method: a database of 1932 patients was analyzed after baseline and feature extraction. Several machine learning methods (SVM, logistic regression, random forest, KNN) were compared based on accuracy, F1 score, recall, precision, sensitivity and specificity. Furthermore the database was divided, based on when the measurement was taken (relative to time of birth), and the accuracy of the methods was compared again at intervals of 1 to 24 hours.

Results: from the machine learning methods the support vector machine using polynomial kernel achieved the highest scores (sensitivity of 55% and specificity of 56%). The inclusion of older measurements caused a decrease ($\approx$ 20%) in the predictive performance of the models.

Conclusion: the results show that in clinical decision making the most crucial fetal heart rate measurements are the ones that are taken the closest to birth.

I. Aim of the paper

Assess and compare the predictive capabilities of fetal heart rate recordings using machine learning methods with relationship to the time they were taken before birth.

II. Introduction

In approximately 0.7% of pregnancies fetal death or brain damage occurs due to severe oxygen deprivation during labor [1]–[3]. Currently, there is no method or instrument to directly measure the fetal blood oxygenation level. Therefore, to predict and prevent hypoxia the fetus is assessed using cardiotocography (CTG).

Cardiotocography is the simultaneous measurement of the fetal heart rate (FHR) and the uterine activity (UA) of the mother. Both results are printed on a strip of paper called cardiotocogram. FHR can be either measured by an external sensor, that is attached to the mothers abdomen, or by scalp electrodes (after the rupture of membranes) attached directly on the head of the fetus. The technology used in the FHR measurement can be based on doppler ultrasound or electronic measurement (similar to ECG). FHR is a widely used metric to evaluate the well being of fetuses ante- and intrapartum because its patterns are directly connected to the oxygenation of the fetus [4].

Uterine activity refers to the contraction of the muscles in the uterus. Similarly to FHR it can be measured electronically or by a pressure transducer. The importance of the uterine activity lies in it's relationship to FHR patterns, mainly when do contractions happen compared to abrupt changes in the FHR.

The goal of FHR monitoring is to predict the fetal state after birth. It is measured using the fetal pH and base excess values (metrics directly quantifying the amount of oxygen in the blood) and the APGAR scores (a numerical representation of fetal health immediately after birth).

The evaluation of the cardiotocogram is performed visually by the physician which leads to poor repeatability and reproducibility [5]–[7]. In its current form the positive effects of CTG are questionable as, since its introduction, it did not lead to a significant decline in fetal asphyxia (low blood oxygen levels) or fetal brain damage but markedly increased the number of medical interventions [8], [9]. Despite these concerns it is widely used [10].

A. Visual classification

To classify the cardiotocograms, whether the fetus is healthy, at risk or in critical condition, medical personnel rely on guidelines given by medical societies. The most widely used and accepted protocols are the following [11], [12]:

- International Federation of Gynecology and Obstetrics (FIGO) (which is also the method used at Erasmus MC)
- Dublin Fetal Heart Rate Monitoring Trial (DFHRMT)
- Royal College of Obstetricians and Gynecologists (RCOG)
- Society of Obstetricians and Gynaecologists of Canada (SOGC)
- National Institute of Child Health and Human Development (NICHD)

There are some differences in the above mentioned guidelines (II-A) but all of them are using the same set of features for classification; baseline FHR, presence or absence of variability and the interpretation of periodic changes (acceleration, deceleration) [14].

- Baseline FHR: is the approximate mean FHR, that excludes periods where the FHR markedly and abruptly changes

Article	Method	Sensitivity [%]	Specificity [%]
[13]	FIGO (II-A)	95	21.8
[12]	DFHRMT (II-A)	100	18
[12]	RCOG (II-A)	100	15
[12]	SOGC (II-A)	88	37
[12]	NICHD (II-A)	67	92

TABLE I: Comparison of different classification methods, description of different methods can be found in tables: CCCXX, CCCXXI, CCCXIX, CCCXVIII, CCCXXII

- Accelerations, decelerations sections of the FHR where it is significantly lower or higher than the baseline. Exact numbers about the size of the difference varies from guideline to guideline
- Accelerations, decelerations can also be characterized based on when they occur relative to uterine contractions, they can be either early or late (a deceleration is categorized as early if it happens at the onset of the contraction, late deceleration happens approximately 15[s] after the uterine contraction peak [15])
- Variability: small changes of FHR relative to the baseline

B. New methods and features for classification

Computerized classification methods have been introduced eliminating the intra- and interobserver variability in decision making but the results' specificity still remains low causing unnecessary interventions (see table V). With machine-, deep learning and AI the number of features that can be included in the decision making drastically increases leading to more accurate results. A large number of papers produced in this area compared the accuracy (mainly using sensitivity [1] and specificity [2]) of different machine learning models and showed which features are the most useful in the classification [16]–[24].

The difficulty in studying CTG monitoring is getting a sufficiently large and accurate database to train the model on. Previous articles mostly relied on intrapartum (during delivery) measurements, when the delivery of the fetus was already in progress. This made it impossible to investigate what are the critical periods, meaning which recordings (depending on the time of the measurement compared to the time of birth), are the most indicative towards outcome, and whether it is possible to predict the outcome of the pregnancy days ahead of birth. The following paper is going to show the accuracy of these machine learning methods in terms of the different algorithms and in terms of when the measurement was taken to investigate which time periods are the most predictive of the outcome.

III. Description of the Database

The database used was collected by the Department of Obstetrics and Gynecology of Erasmus MC (Rotterdam, Netherlands) between 2017 and February of 2020. Fetal heart rate measurements were conducted as part of standard clinical care of patients. Requirement for admission were some complications during the pregnancy, preexisting conditions or risk factors (eg.: obesity, high blood pressure, preeclampsia, gestational diabetes...). Fetal CTG was performed on patients routinely using Philips Avalon FM30 (Philips, Eindhoven, the Netherlands).

The distribution of the database is unequal both in terms of the length of the measurements of individual patients (figure 1) and in terms of when the measurement was taken before birth (figure 2). This makes the analysis and the comparison

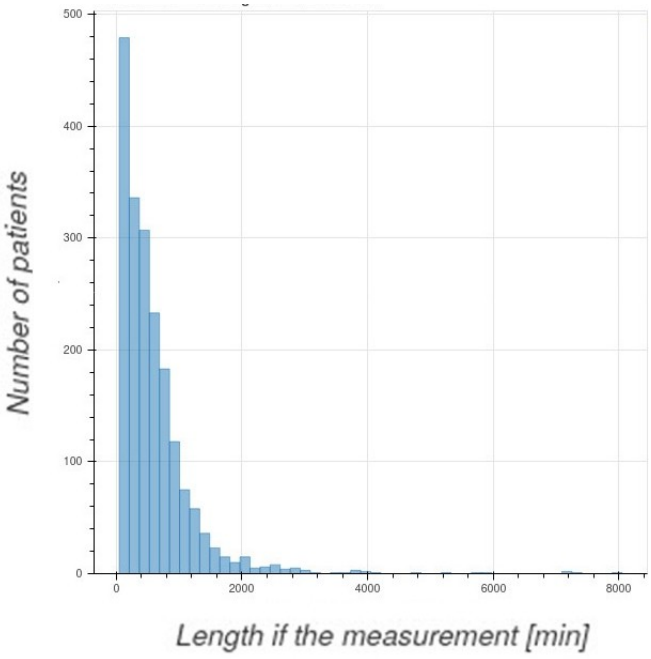

Fig. 1: Distribution of total length of CTG recordings

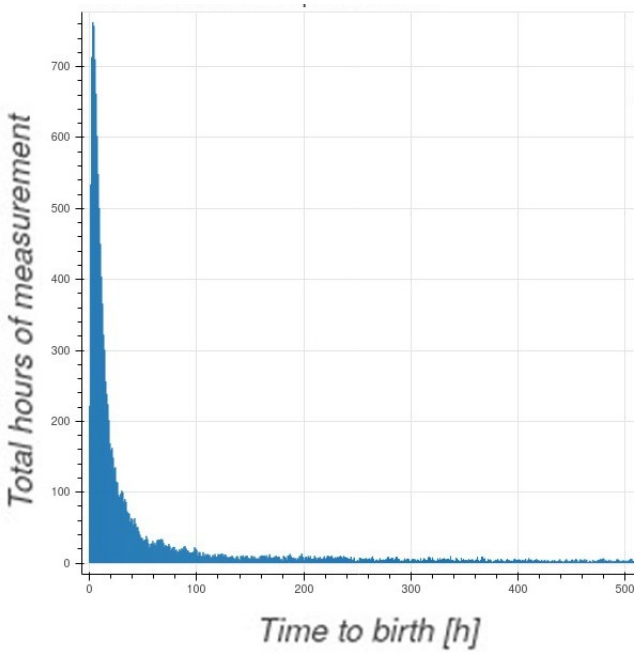

Fig. 2: Distribution of the start time of each measurement, relative to time of birth

[1]Sensitivity is calculated by dividing the number of true positives by the number of true positives and the number of false negatives

[2]Specificity is calculated by dividing the number of true negatives with the number of true negatives plus the number of false positives.

of the results more difficult but gives the opportunity to investigate the feature selection and the predictive capabilities of CTG from the perspective of when the measurement was taken relative to the time of birth. This is especially relevant nowadays when there are a number of companies that are developing continuous monitoring devices that would be capable of performing CTG measurements weeks on end [25], [26].
In addition to the fetal heart rate the maternal heart rate and the uterine activity was also measured and included in the analysis.
For the classification of the outcome depending on data availability the umbilical cord pH and APGAR scores were used.

IV. Selection and filtering processes

The transformation of the database from its raw form to the final features was composed of the following steps (explained in more detail in appendix B):

- data anonymization
- removing unnecessary sections of the database
- remove patient files where there was no actual measurement data
- filter out the patients that do not have the required outcome results (Apgar score, pH value, BE value)
- pair the measurements to the outcome parameters
- calculate the FHR baseline (section IV-A)
- detect the FHR accelerations and decelerations compared to the baseline, explained in more detail in section IV-B
- feature extraction explained in more detail in section V
- split the features to smaller parts depending on when they were taken relative to the time of birth
- perform feature selection [27]
- compensate for the imbalanced dataset, explained in detail in section VII

A. Baseline calculation

Baseline calculations were performed using a method described in Samuel et al. [28] with minor modifications. The process was the following;
The nature of the recording was that multiple measurements were done on patients, where time difference between recordings could be days. To avoid an old data to interfere with a more recent ones, the measurements were sectioned into individual ones. The criteria for separation was that the time difference between two consecutive data points was larger than 20 minutes (value found after empirical testing [3]).
Following partitioning the data, aberrant samples were deleted, FHR higher than 200 or lower than 100 bpm. Cutoff values were chosen based on the fact that the FHR should be within the range of 120-160 bpm [29] therefore it should never exceed 200 bpm or be lower than 100 bpm. Consecutive data points where the difference was higher than 25 bpm were deleted (value chosen after empirical testing) .
After the outlying point removal, small gaps that occur naturally during measurements needed to be dealt with. Gaps bigger than 1 second but smaller then 30 seconds were filled in using Hermite spline interpolation (constants chosen after empirical testing) [23].
The original sampling frequency of the device was 4 [Hz], after investigation it was decided that for the baseline approximation subsampling was needed. This was performed by only taking into consideration every 10th data point. It was necessary because it lead to no noticeable difference between the results of baseline calculation but caused a nearly 10 fold computational time decrease.
The FHR baseline calculation is a complicated process. A method needs to be found that is able to follow the slow gradual changes that are present in fetal heart rate and ignore fast accelerations and decelerations in it. To combat these two different aspects of the baseline it was calculated from two probability parameters: P_{trim}, and P_{stab}. P_{stab} is used to filter out periods of fast changes in the FHR and P_{trim} is used to adjust the baseline to the slow gradual changes.
First P_{stab} needs to be calculated [28]:

$$P_{stab}(i) = \frac{e^{L(i)}}{1 + e^{L(i)}} \tag{1}$$

Where $L(i)$ is calculated through an iterative process [28]:

$$\begin{gathered} L(i) = -2.4744 + 0.0266\|d(FHR_{0-1bpm}(i))\| + \\ 0.0413 envelope(dFHR_{0-1bpm})(i) + \\ 0.0105 envelope(dFHR_{1-3bpm})(i) + \\ 0.0036 envelope(dFHR_{3-7bpm})(i) \end{gathered} \tag{2}$$

Here the FHR_{a-b} is a sixth order Butterworth filter between frequencies a and b (parameters are described in table II).
After applying different Butterworth filters the to the signal, its derivative is calculated. The final result is obtained by multiplying the derivative with the difference between the lower and upper bounding envelope of the signal [30].
The equation for the second parameter P_{trim} is the following:

$$P_{trim_k}(i) = \frac{e^{C_k - 0.19\|FHR_{0-f_{k-1}}(i) - BL_{k-1}(i)\|}}{1 + e^{C_k - 0.19\|FHR_{0-f_{k-1}}(i) - BL_{k-1}(i)\|}} \tag{3}$$

In this equation the k is the iteration number from 1 and 2 (In the article [28] 6 iterations were used in total but through experimentation the iterations higher then 2 did not have a major effect on the baseline (as shown on figure 3) but caused unnecessary computation burden therefore they were omitted.)
The third parameter (W_k) was the weight factor in the median filter. It was adjusted at every iteration to give gradually higher weight to the closer data points.

$$W_k(i) = W(i)^{Pw_k} \tag{4}$$

Here the Pw_k's value was increased with every iteration, so that the closer the points were to the currently investigated points would have higher weight.
For the final baseline results the two probability and the Pw_k values were combined together in a weighted median filter where the sliding window was set to 40 minutes (for points at the end or the beginning of the measurement, or measurements shorter than 40 minutes the length of the median filter was shortened) [28]:

$$\begin{gathered} BL_k(i) median_{j=-\frac{L}{2}\dots\frac{L}{2}} = \\ FHR_{0-f_k}(i-j), P_{stab}(i-j) P_{trimk}(i-j) W_k(j) \end{gathered} \tag{5}$$

[3] all the used hyperparameters are enumerated in appendix H

Iteration (k)	1	2	3	4	5	6
Power weight (Pw_k)	1	2	4	8	16	16
Cut-off f. f_k $[Hz]$	$\frac{1}{240}$	$\frac{2}{240}$	$\frac{4}{240}$	$\frac{8}{240}$	$\frac{16}{240}$	$\frac{16}{240}$
C_k	$+\inf$	3.2	2.5	2	1.5	1

TABLE II: Coefficients used in the iterations [28]

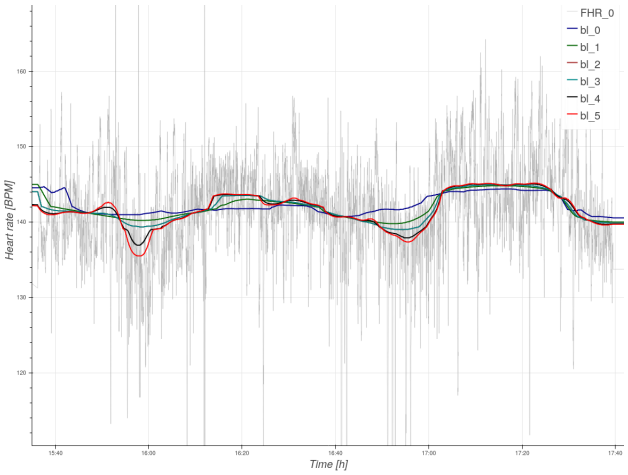

Fig. 3: The successive iterations of baseline estimation using equation 5 with coefficients from table II

In measurements where the FHR is mostly composed of accelerations and decelerations the baseline estimation is especially difficult. The above described process can cause inaccuracies. To combat these a final step was added. If the difference between two subsequently estimated baseline was higher than 10% (relative to the new one), at those points, instead of the newly estimated baseline the old one was used.

$$if \|BL_{old} - BL_{new}\| > 0.1\ BL_{old}: \\ BL_{new} = BL_{old} \tag{6}$$

B. Definitions of accelerations and decelerations

As described earlier in section II-A in the currently used clinical practices the accelerations and decelerations have critical importance and are one of the main features based on which fetuses get categorized.
Before acceleration and deceleration detection the data points were sectioned, filtered, and resampled (using the same method and parameters as for the baseline calculation described in section IV-A). Additionally a fourth order Butterworth lowpass filter was applied to the signal at a cutoff frequency of $16/240[Hz]$ [28]. A time period of the measurement was classified as acceleration or deceleration if the FHR was higher or lower than the baseline for 40 seconds and there was a maximum difference of at least 10 bpm. The original values for classification from FIGO [31] (30 seconds, and 15 bpm) were adjusted slightly. This was necessary because of the baseline estimation method. It continuously approximates the current FHR, meaning that with the original values many acceleration or deceleration would not be detected. Results of the method as used can be seen in figure 4.

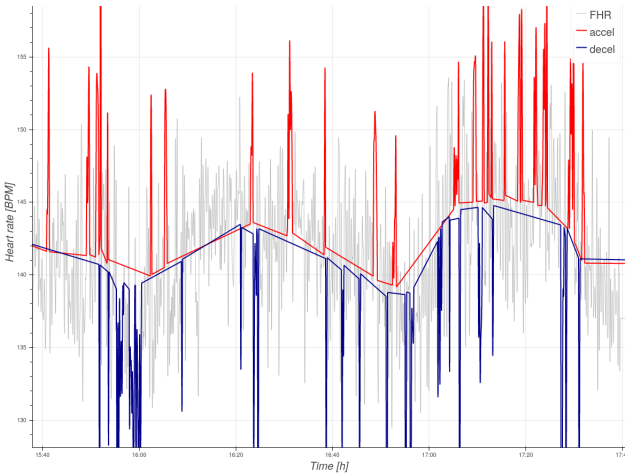

Fig. 4: Fetal heart rate before filtering, and categorization of FHR to accelerations and decelerations

C. Uterine activity

Filtering of the uterine activity was done similarly to other signals. First, parts that are higher than 40 [-] or lower than 5 [-] were deleted because they were deemed as outliers. These limits were set due to the way the device measures UA. It quantifies the weight exerted by the uterus on the device that is strapped to the abdomen. The range of forces depends largely on how firmly the device is attached to the abdomen. To make the results comparable it calibrates before every measurements setting the zero point to 20 from which every 1 unit of deviation represents a 2.5 [g] difference of weight that the device measures.
UA recordings were also separated into smaller continuous measurements among the same criteria as the FHR. Individual recording files were filtered by removing the datapoints out of the range of the 0.01 and 0.99 percentiles. Finally a moving average filtering was used with a length of 50 seconds.
The peak was found by using a peak detection algorithm by Eli Billauer [32].

D. Maternal heart rate

The database also included maternal heart rate recordings that were also measured using the Philips Avalon FM-30. The quality of the heart rate measurements was much higher than the other recordings therefore no filtering was required here besides filling in the measurement gaps using Hermite spline interpolation.
The same features were extracted from the maternal heart rate as from the FHR but in the ranking of the features these performed very poorly and were not included in the machine learning models.

V. Features

The complete list the implement features can be found in the appendix section A.
There were a large number of features calculated (98 in total). The main source of them was time, geometrical, frequency and nonlinear domain of the fetal and maternal

heart rate. These were obtained using a heart rate analysis toolbox (explained in appendix C) [33]. The acceleration and deceleration characteristics were also calculated. Additional features were obtained by calculating the characteristics of accelerations and decelerations and by using a feature set by V. Chudavcek et al. [34] (explained in appendix D).
To be able to investigate the longitudinal changes that happen in the features the measurements were separated into smaller parts. First the individual measurements were separated (as described in section IV-A). Then the individual measurements were further dissected into 4 minute long intervals.The features were then calculated individually from these measurement parts.
To investigate the changes over time in the features a line was fitted to the points such that the root means square distance between trend line and original points is minimized ($y = ax + b$). The gradient of this line (a) was added as a feature [35].

VI. Selection of the relevant features

As mentioned earlier there were a large number of features calculated. Creating a subset of them composed of the most relevant ones is an useful tool to avoid overfitting and it makes easier to understand their importance.
To select the features with the highest levels of predictive capabilities each of them was ranked by 5 different methods, Pearson correlation, chi-squared test, recursive feature elimination, lasso selector and tree selector (described in more detail in appendix 10). Each method created its own top 10 list. Features that were included in at least one of such lists were used in the final machine learning algorithms.

The feature selection was performed on a subset of the entire dataset, it was done on the results where the classification of the fetus was based on the pH level and not on the APGAR scores. This was necessary because the methods used in feature selection cannot be used with binary data (healthy-unhealthy).
The top ranked features were the following:

- triangular_index: geometrical feature, it is the integral of the density distribution [33]
- std_hr: time domain feature, standard deviation of heart rate [33]
- SB_BinaryStats_mean_longstretch0: time domain feature, it is the measure of the longest run of consecutive decreases in the heart rate [36]
- SC_FluctAnal_2_dfa_50_1_2_logi_prop_r1: time domain feature, proportion of slower timescale fluctuations that scale with DFA (detrended fluctuation analysis) (50% sampling) [36]
- shannon_ent_slope: frequency domain feature, shannon entropy changes between the measurements [33]
- sdsd: time domain feature, the standard deviation of differences between adjacent RR-intervals [33]
- total_power_slope: frequency domain feature, trend total power density of the signal [33]
- total_power: frequency domain feature, total power density of the signal [33]

pH	Mean of the APGAR scores	Healthy fetuses	Acidotic fetuses
7.3	6	713	866
7.25	5	997	582
7.2	3	1264	315
7.15	3	1454	125
7.1	3	1535	44

TABLE III: The decision boundaries for pH and Mean Apgar score and the resulting number of healthy and acidotic fetuses

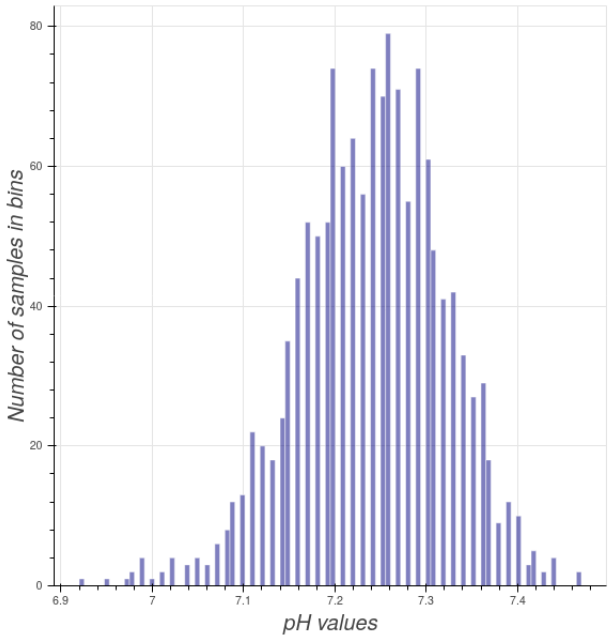

Fig. 5: Distribution of pH values found in the database

- std_slope: time domain feature, trend of standard deviation of heart rate [37]
- std_hr_slope: time domain feature standard deviation of heart rate [37]

A feature was included in the final machine learning model if it was selected to be one of the top ten features by at least one of the five different methods.

VII. Dealing with imbalanced data set

For the classification five different decision boundaries were used, these created varying numbers of healthy and acidotic fetuses, in table III the border values and the number of fetuses falling into the different categories is shown. The decision boundaries were based on the FIGO classification [11] for the pH scores and on J. Drage et al. [38] for the APGAR scores. As with other studies the number of healthy patient records exceeded the number of patients with fetal acidosis or low APGAR scores [16], [17], [29]. With the decision boundary set to pH = 7.2 and APGAR = 3 only 19% of the cases were classified as acidotic. The first implementation of a model on unchanged data led to results that indicated that the model ignored the acidotic patients and classified every measurement as healthy (almost 100% sensitivity but low specificity values $\approx 0\%$).
This imbalance of the groups needed to be corrected. There are three main methods: undersample majority class (healthy

fetuses), create synthetic samples, or to oversample the minority class (acidotic fetuses) [39]. In the current case due to the number of samples undersampling the majority class is not applicable because it would lead to a data set where the number of samples would not be enough to perform any kind of analysis.
Synthetic data was generated using SMOTE (Synthetic Minority Oversampling Technique) was used with the application of nearest neighbors [40], it did increase specificity and made the overall model parameters better, however the results were not satisfactory (shown in the appendix E).
Oversampling of the minority class made the biggest improvements in the results. This method consists of adding more copies of the minority class to the data set, therefore making the two classes equal in size.
All the results of the articles will be the outcome of the analysis performed on the upsampled dataset unless stated otherwise. In the appendix E all the results (performed on the different databases) are shown.

VIII. Machine learning methods implemented

In total three different machine learning methods were implemented and the results compared. The methods (and corresponding hyperparameters) were the following:

1) Logistic regression with liblinear solver, and OVR (One-Vs-Rest) classifier. L1 regularization was used and the maximum number of iterations was limited to 1000 (abbreviation: log_reg)
2) Support vector method with four different kernels was implemented;
   - linear kernel, regularization parameter = 0.5 and the decision function: OVR (abbreviation: svm_lin)
   - second degree polynomial kernel, regularization parameter = 0.1 the decision function shape: OVO (One-Vs-One), the kernel function coefficient ($coef0$) = 10 (abbreviation: svm_poly)
   - RBF kernel where the kernel coefficient (γ) = auto (1/number of features), and the decision function shape = OVO (abbreviation: rbf_grid)
   - sigmoid kernel, with regularization parameter (C) = 0.5, kernel coefficient (γ) = 1/number of features, and kernel function coefficient ($coef0$) = 0.1 (abbreviation: grid_sigm)
3) Random forest classifier; this method creates and fits a number of decision tree classifiers on different subsamples of the data set, after which it uses averaging of the different branches to find the best results. Here the number of estimators was set on 1000, the data set split was supported by the Gini impurity criteria, the minimum number of samples required to split an internal node was 10, the minimum number of samples required to be at a leaf node was 10 and the number of features to consider when looking for the best split was the square root of the total number of features (abbreviation: random_for).
4) K-nearest neighbors classifier; the number of neighbors was 10. The weight points were calculated by the inverse of their distance, meaning that the closer neighbors of the query point have greater influence than those located further. The method to compute the nearest neighbors was set to ball tree, where the leaf size passed over was 40. The power parameter for the Minkowski metric was 2 meaning that euclidean distance was used (abbreviation knn).

Method	Acc.	F1_score	Prec.	Rec.	Sens.	Spec.
svm_poly_syn	0.554	0.655	0.842	0.543	0.543	0.594
svm_poly_ups	0.602	0.709	0.844	0.617	0.617	0.538
svm_poly	0.8	0.889	0.801	0.997	0.997	0.004
svm_lin_syn	0.562	0.66	0.839	0.548	0.548	0.58
svm_lin_ups	0.59	0.695	0.839	0.597	0.597	0.541
svm_lin	0.801	0.888	0.8	0.999	0.999	0.002
random_for_syn	0.701	0.808	0.823	0.79	0.774	0.323
random_for_ups	0.753	0.85	0.817	0.888	0.867	0.188
random_for	0.804	0.886	0.808	1	0.957	0.001
rbf_grid_syn	0.585	0.687	0.829	0.581	0.551	0.562
rbf_grid_ups	0.63	0.734	0.832	0.653	0.618	0.499
rbf_grid	0.807	0.882	0.816	1	0.913	0
grid_sigm_syn	0.577	0.686	0.806	0.574	0.55	0.516
grid_sigm_ups	0.576	0.689	0.805	0.565	0.559	0.54
grid_sigm	0.798	0.87	0.826	0.97	0.846	0.05
log_reg_syn	0.598	0.706	0.807	0.587	0.559	0.549
log_reg_ups	0	0	0	0	0	0
log_reg	0.811	0.873	0.831	0.99	0.827	0.015
knn_syn	0.565	0.683	0.767	0.547	0.523	0.508
knn_ups	0.613	0.725	0.784	0.625	0.568	0.441
knn	0.811	0.867	0.841	0.98	0.774	0.031

TABLE IV: Average results of the first 24 hours of different methods and databases at pH=7.2 (the highlighted values are the highest ones in their respective columns, not taking into consideration the original dataset)

IX. Results

For this paper a total of 1932 patients' heart rate recordings were analysed, after thorough filtering and feature extraction and selection, their predictive capabilities were assessed using different machine learning methods.
Using the three datasets (explained in section VII) results in noticeable differences in the performance of the ML methods. Table IV shows that based on the majority of attributes the original dataset achieves the highest results, meanwhile in the cases where the imbalance was corrected perform significantly worse. This difference of performance can be observed in every performance metric except with the specificity.
In the majority of the evaluation criteria the best performing method is the support vector machine with rbf kernel (accuracy, F1 score, recall, sensitivity and specificity), the other method that performed better than the average was the support vector machine with polynomial kernel.
The following plots show the sensitivity (figures 6 and 7) and specificity (figures 8 and 9) scores of those two classifiers (rest of the metrics can be found in the appendix G), and how do those values change depending on how older data is included in the analysis.
Here the decision boundary was at $pH = 7.2$ and APGAR score at 3 using the three different datasets that were created by balancing (or not balancing) for the minority class. The results of the other classifiers can be found in the appendix F.

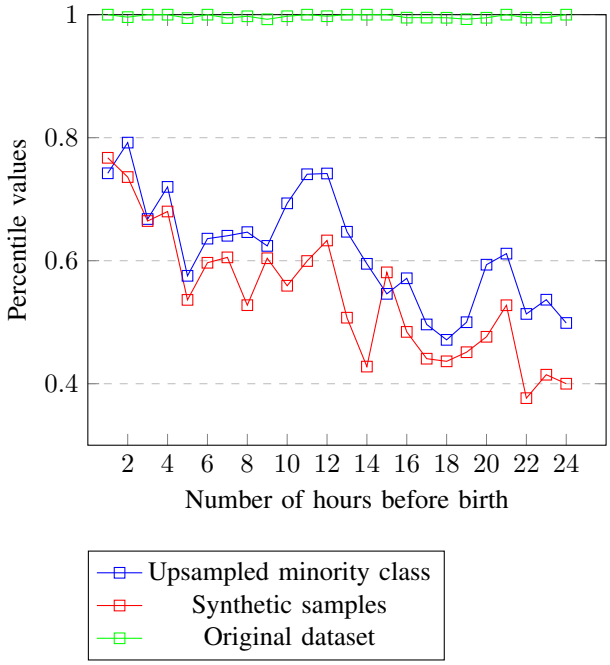

Fig. 6: Sensitivity of SVM with polynomial kernel, depending on the number of hours included in the analysis

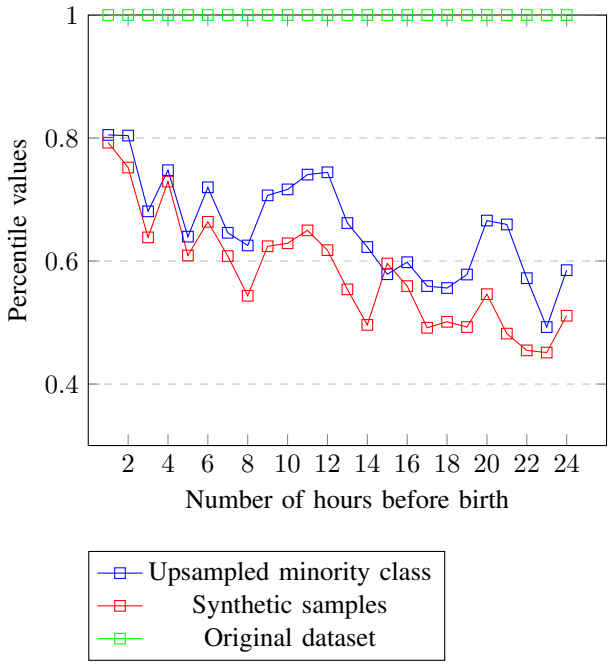

Fig. 7: Sensitivity of SVM with RBF kernel, depending on the number of hours included in the analysis

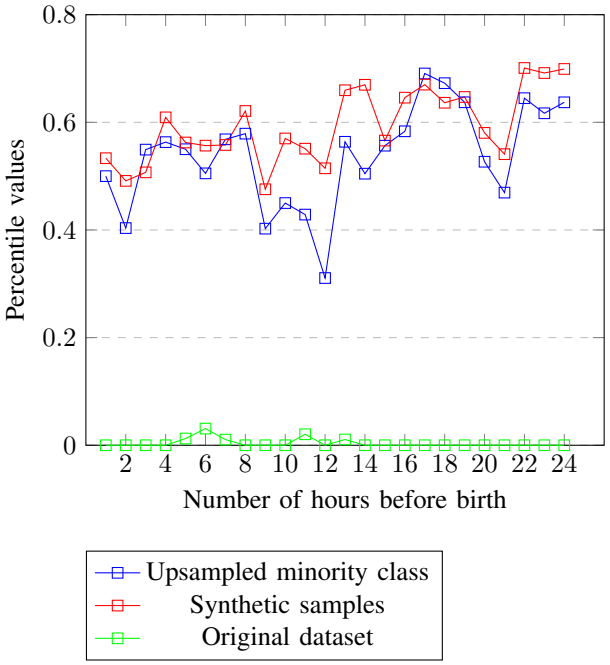

Fig. 8: Specificity of SVM with polynomial kernel, depending on the number of hours included in the analysis

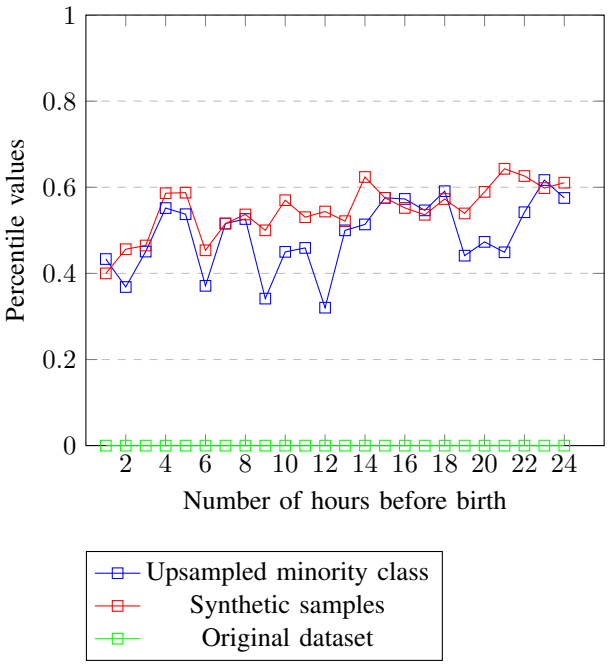

Fig. 9: Specificity of SVM with RBF kernel, depending on the number of hours included in the analysis

On specificity (figures: 8 and 9) the datasets that were upsampled performed markedly better. Because this metric is the most important for accurate fetal classification (the reasons explained in section X). For the rest of the analysis only results that were made with datasets where the imbalance in the datasets was compensated either by upsampling or by creating artificial samples are going to be taken into consideration.

When analyzing the effect of time there was an inverse relationship between the length of the measurement and its accuracy. Meaning that the longer the measurement segment analysed the worse the results were. This means that the closer the measurement is to the time of birth the higher its predictive

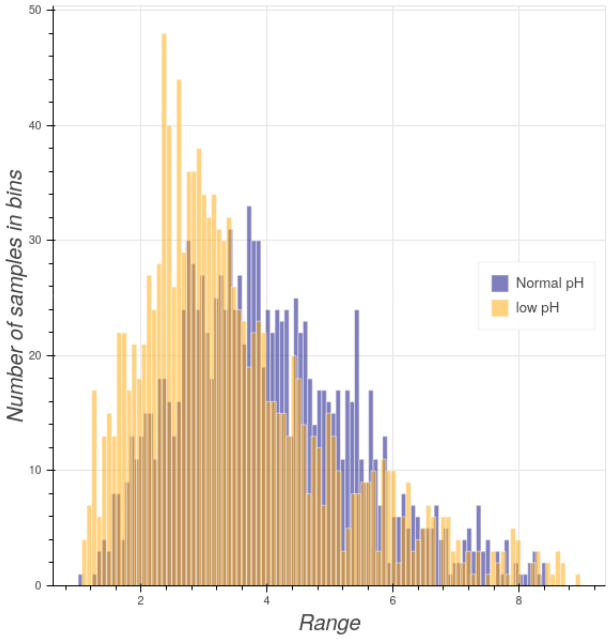

Fig. 10: Distribution of the triangular index of healthy and acidotic neonates

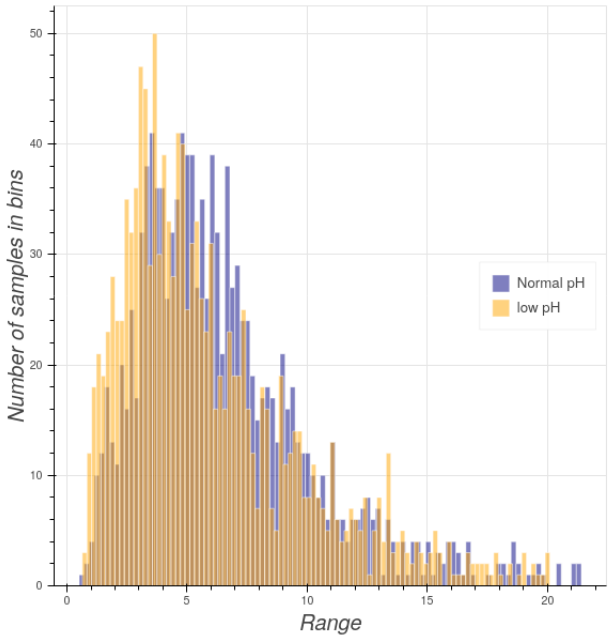

Fig. 11: Distribution of standard deviation of heart rate in healthy and acidotic neonates

capabilities are. The decrease in performance due to time is the highest when using support vector machines and the lowest when using random forest method (see figure: 40).
The only metric that increases with the inclusion of more patient data is the specificity, especially using support vector machines. There can be even a 15-20 % increase between using just one hour of measurement and 24 hours.

A. Influence of features with the highest classification performance

In the following figures (10, 11, 12, 13, 14) the best predictor parameters (selected in VI) are shown in patients with poor ($pH \approx 7$) and healthy ($pH \approx 7.4$) outcome to highlight the differences.
In these figures the difference between the fetuses is visually noticeable. This is especially the case with the distribution of the total power density (figure 14) of the FHR and with the distribution of the triangular index (figure 10).

B. Comparision of results with other works

Table V shows the specificity values achieved by other authors using several different ML methods and the results achieved in this work.

X. Discussion

The main goal of the paper was to investigate the relationship between the time, when a measurement was taken before birth, and its predictive capabilities. When doing literature research in this area no papers could be found. The articles investigated mostly the sensitivity and specificity of different machine learning methods or which features are the most predictive towards outcome.

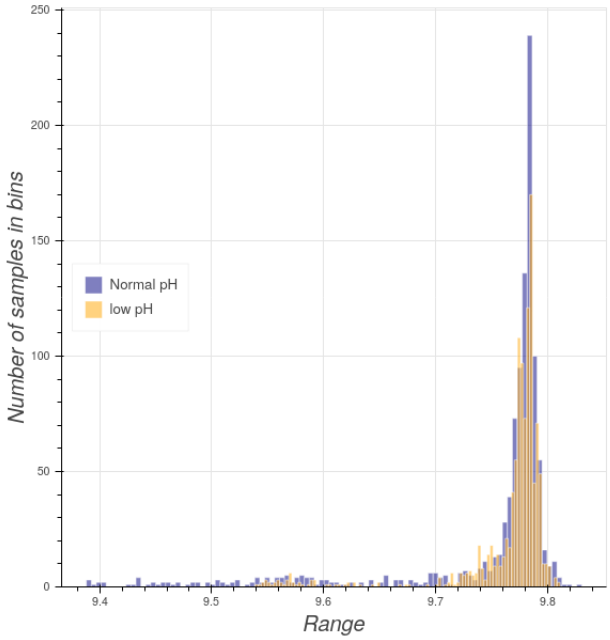

Fig. 12: Distribution of shannon entropy of healthy and acidotic neonates

As discussed in section II the use of fetal heart rate monitoring in the maternity wards did not lead to the expected improvements of fetal outcome, it only led to an increased number of medical interventions during delivery. To decrease unnecessary interventions current articles in this topic put a big emphasis on correctly classifying the fetuses in danger avoiding misdiagnosis. This is especially difficult because in the vast majority of births are without complications, therefore it is easy to make false positive assumptions [1]–[3].
To investigate the time factor a large database of fetal heart rate

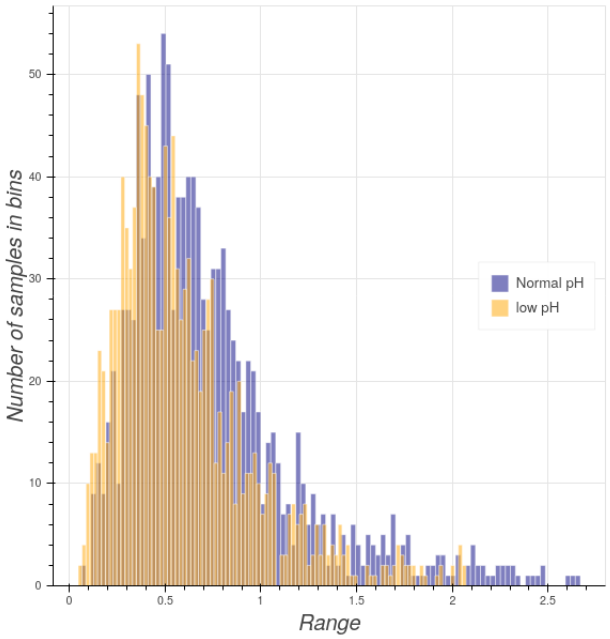

Fig. 13: Distribution of standard deviation differences between adjacent RR intervals in healthy and acidotic neonates

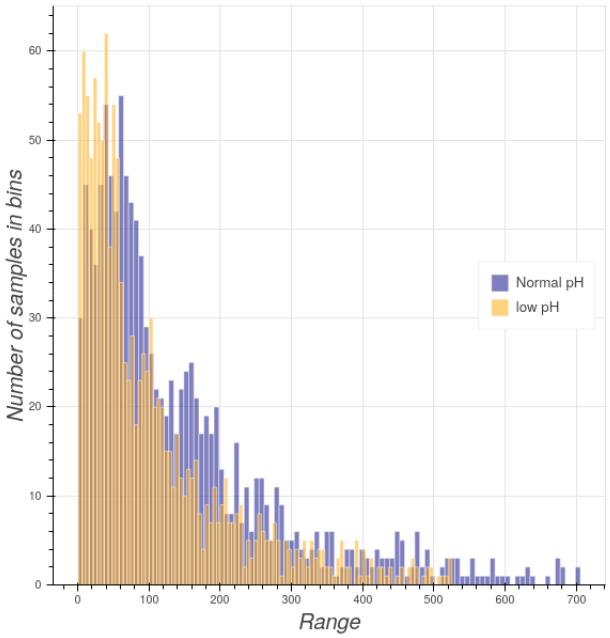

Fig. 14: Distribution of the total power density of FHR of healthy and acidotic neonates

recordings was segmented depending on when they were taken before birth. These segments were used as inputs to seven different ML algorithms. These algorithms were subsequently assessed using 6 metrics (accuracy, F1 score, precision, recall, sensitivity and specificity). This gave two sets of results, it selected the machine learning method with the best parameters and also analysed the predictive capabilities of the measurements based on the time of the recordings.

Concerning the ML methods the highest performance method was the support vector machine with polynomial and RBF kernel at pH of 7.2 and APGAR score of 3 as classification boundary they achieved a specificity of 60% and 56%.

Article	Method	Sens [%]	Spec [%]
This article	**SVM-polynomial kernel**	**55**	**60**
This article	**SVM RBF kernel**	**55**	**56**
[16]	Generative model	61	82
[17]	SVM	96	-
[18]	Sparse SVM	70	70
[19]	Genetic algorithm, RFC RFC-R (Random Forest using regression) LASSO	66.83, 67.92, 61.15, 66.83	81.13, 77.36, 73.58, 78.25
[20]	Sparse SVM applied to p-leader multifractal features	70	59
[21]	Sparse SVM	73	75
[22]	SVM	88	75

TABLE V: Sensitivity and specificity results from other studies and the results from this article

The results indicate that the later the measurement is taken before birth the less importance it has for clinical diagnosis. Furthermore there were no early indicators of poor patient outcome. This is an important aspect for the clinicians as it shows that for the decision making past measurement results should not be taken into consideration.

The results show that, with the exception of the specificity, the performance metrics do not improve, rather degrade when using older measurements.

One of the most unexpected conclusion came as a result of the feature selection (section VI), where in the top ten features the characteristics of the accelerations and decelerations did not appear however in the current decision making processes these ones are the most critical features and are heavily relied on by clinicians. These results are in line with the conclusions of article by Xu et al. [19], indicating that the currently used features are not the most predictive ones. A revision of the current criteria is necessary with an increased number of features included.

In the selected features the highest ranked ones were related to the entropy of the signal and the beat to beat variations of the heart rate. Although the inclusion of older measurements led to a decrease in performance in the selected features out of the top 10 there were 4 features that were calculated not from the heart rate but from the changes of the feature over time (increase or decrease). This indicates that short term trends in changes of features hold as much, or even more, value in terms of classification as their numerical values.

The performance of the ML models did not achieve the sensitivity and specificity of other published methods, although the features used were the same or at least covered the same basic principles. It is hard to point out the exact reason(s) behind this decrease in performance. The possible reasons can be the following:

- the databases used in previous studies were generally smaller, this could have lead to overfitting, because there were no mentions of corrections for the imbalanced datasets [18], [20], [22], [34],
- previous datasets used measurements as close to the delivery as possible (which was shown having higher

clinical importance),
- in other studies bigger emphasis was put on the uniformity of the data, generally they were equal length and taken at the same period of the pregnancy,
- the ML methods used in other articles is impossible to recreate because the amount of information given about them is limited because it does not include the hyperparameters that they used [18]–[22].

XI. Conclusion

The segmentation showed that for clinical decision making the last few hours of the measurements hold the highest predictive values. Besides the numerical values of the features their change in time (trends) must also be assessed. The use of continuous monitoring is beneficial from the sense that it is impossible to foresee the time of birth as it is also influenced by the measurement.

The inclusion of automatic analysis methods significantly increases the precision of the diagnosis and also makes it more reliable as it increases repeatability.

The ranking of the features showed that there are features with far higher prediction capabilities than the currently used ones (especially the accelerations and decelerations). It would be advantageous if those were also included in the decision making.

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APPENDIX A
ALL THE EXTRACTED FEATURES

Complete list of the features

1) lateaccel
2) earlyaccel
3) latedecel
4) earlydecel
5) lateaccel_avglen
6) earlyaccel_avglen
7) latedecel_avglen
8) earlydecel_avglen
9) lateaccel_maxbpm
10) earlyaccel_maxbpm
11) latedecel_maxbpm
12) earlydecel_maxbpm
13) lateaccel_auc
14) earlyaccel_auc
15) latedecel_auc
16) arlydecel_auc
17) mean_rr
18) std
19) vlf
20) lf
21) hf
22) ratiosd1sd2
23) sdnn
24) sdsd
25) rmssd
26) median_nni
27) range_nni
28) ccvsd
29) mean_hr
30) max_hr
31) min_hr
32) std_hr
33) sampen
34) sd1
35) sd2
36) csi
37) cvi
38) shannon_ent
39) sample_ent
40) permutation_ent
41) total_power
42) cvnni
43) triangular_index
44) lf_hf_ratio
45) lfnu
46) hfnu
47) mean_rr_slope
48) std_slope
49) vlf_slope
50) lf_slope
51) hf_slope
52) ratiosd1sd2_slope
53) sdnn_slope
54) sdsd_slope
55) rmssd_slope
56) median_nni_slope
57) range_nni_slope
58) ccvsd_slope
59) mean_hr_slope
60) max_hr_slope
61) min_hr_slope
62) std_hr_slope
63) sampen_slope
64) sd1_slope
65) sd2_slope
66) csi_slope
67) cvi_slope
68) shannon_ent_slope
69) sample_ent_slope
70) permutation_ent_slope
71) total_power_slope
72) cvnni_slope
73) triangular_index_slope
74) lf_hf_ratio_slope
75) lfnu_slope
76) hfnu_slope
77) DN_HistogramMode_5
78) DN_HistogramMode_10
79) CO_f1ecac
80) CO_FirstMin_ac
81) CO_HistogramAMI_even_2_5
82) CO_trev_1_num
83) MD_hrv_classic_pnn40
84) SB_BinaryStats_mean_longstretch1
85) SB_TransitionMatrix_3ac_sumdiagcov
86) PD_PeriodicityWang_th0_01
87) CO_Embed2_Dist_tau_d_expfit_meandiff
88) IN_AutoMutualInfoStats_40_gaussian_fmmi
89) FC_LocalSimple_mean1_tauresrat
90) DN_OutlierInclude_p_001_mdrmd
91) DN_OutlierInclude_n_001_mdrmd
92) SP_Summaries_welch_rect_area_5_1
93) SB_BinaryStats_diff_longstretch0
94) SB_MotifThree_quantile_hh
95) SC_FluctAnal_2_rsrangefit_50_1_logi_prop_r1
96) SC_FluctAnal_2_dfa_50_1_2_logi_prop_r1
97) SP_Summaries_welch_rect_centroid
98) FC_LocalSimple_mean3_stderr

APPENDIX B
COMPLETE EXPLANATION OF THE STEPS

Transforming the database from its raw form to the final features was a long process that included several steps for filtering, preprocessing, establishing the baseline, generating the features and the machine learning results. Out of these the filtering step is one of the most important stage of the analysis. Different processes were implemented for the two main source of the data (FHR, and UA). The selected program for the data analysis and evaluation was Python 3.6.

The process from the raw data to the machine learning results consisted of the following steps:

1) Encryption of the patient number with sha256 (Secure Hash Algorithm) to maintain patient anonymity.
2) Removal of information from the database that were not essential for the analysis, the database includes several other entries that are not essential for fetal heart rate analysis, such as time and location of admission, meeting ID, device and treatment codes etc...
3) Remove files where the measurement device was connected but did not actually produce results, after trial end error it was found that if higher than 60% of all entries did not include numerical data than the patient did not have enough measurements to be included in further analysis.
4) Filter out the patient outcome results that are going to be used for the final classification. The patient outcome results included a wide range of parameters including: birth weight, percentile, parity number (number of previous pregnancies), how the delivery was performed (C-section, or other type of instrumented delivery), these entries are not relevant for the analysis therefore only the umbilical cord pH, base excess, and APGAR scores were kept.
5) Pair the measurements to the patient outcome, based on the patient identification number. Up until this point the outcome of the pregnancy and the measurements taken during pregnancy were kept in separate files, and to be able to evaluate the accuracy of the prediction model they needed to be joined.
6) Calculate the baseline of the fetal heart rate using the method from Samuel et al. [28], described in more details in section IV-A.
7) Calculate the accelerations and decelarations of the FHR relative to the baseline, explained in more detail in section IV-B.
8) Feature extractions (in total there were 98 different features) explained in more detail in section V.
9) Split the measurement results in parts, depending on when they were taken relative to the time of birth. This step was necessary to be able to evaluate the predictive capabilities of FHR recorded at different times relative to birth. The dataset was divided into 48 different parts. The division of it was made at 1 hour intervals (1-24) to measurements taken between the time of birth and x hours before the time of birth, and measurements that were taken earlier than x hours to the time of birth.
10) Feature selection: evaluate the importance of features using several different methods (Pearson correlation, chi-squared test, recursive feature elimination, lasso and tree selector) and using majority voting select the most relevant ones [27]. The feature selection methods were the following:
    - Pearson correlation: the absolute value of the Pearson's correlation was checked between the target values and the values of the feature, and based on this correlation the different features were ranked. The equation to calculate the correlation was the following: $r = \frac{\sum(x-\overline{x})(y-\overline{y})}{\sqrt{\sum(x-\overline{x})^2(y-\overline{y})^2}}$ [40].
    - Chi-squared test: the chi-square metric is calculated between the individual features and the target values and the features with the highest metric are selected. The metric is calculated using $\xi_c^2 = \sum \frac{(O_i-E_i)^2}{E_i}$ [40].
    - Recursive feature elimination: this methods selects the best features by recursively considering a smaller and smaller set of features through logistic regression. This is an iterative process where first an estimator is trained on the features, where each of them is assessed. At the end of the step the least important features are dropped, after which the features are ranked again. This process continues until only the desired number of features remain [40].
    - The LASSO (or L1) and the tree selector algorithms are embedded methods, meaning that the machine learning algorithms behind them have built in feature selection methods. They have the ability to rank features based on how much they add to the overall accuracy of the model. This information can be used as a feature selection method [40].
11) Compensate for the imbalanced data sets by upsampling the minority group.

APPENDIX C
HEART RATE ANALYSIS TOOLBOX

The Heart Rate Variability Analysis toolbox was developed in July 2018 by the Aura Heathcare project. The goal of this toolbox is to analyse and filter the RR (RR= 1/bpm) intervals of the heart. The toolbox has functions both to filter heart rate measurements and to calculate its properties. In my implementation this toolbox was not used for filtering only for feature extraction. The features can be grouped into four different types;

- Time domain,
- Geometrical domain,
- Frequency domain,
- Non linear domain features.

APPENDIX D
CATCH22, CANONICAL TIME-SERIES CHARACTERISTICS

catch22, is a collection of 22 time series features selected from the hctsa (highly comparative time-series analysis) toolbox, which contains over 7000 different functions [41], [42]. catch22 is a subset of those functions selected based on their classification performance and mutual redundancy [36].

APPENDIX E
NUMERICAL RESULTS OF DIFFERENT METHODS AT DIFFERENT CLASSIFICATION BOUNDARIES AND SECTIONS OF MEASUREMENTS

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.968254	0.983871	0.994565	0.973404	0.994565	0
Logistic regression synthetic samples	0.84127	0.913793	0.86413	0.969512	0.86413	0
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.973545	0.986595	1	0.973545	1	0
svm, linear kernel, synthetic samples	0.84127	0.913295	0.858696	0.975309	0.858696	0.2
svm, linear kernel upsampled samples	0.851852	0.91954	0.869565	0.97561	0.869565	0.2
svm, poly	0.973545	0.986595	1	0.973545	1	0
svm, poly synthetic samples	0.846561	0.916905	0.869565	0.969697	0.869565	0
svm, poly upsampled	0.84127	0.913793	0.86413	0.969512	0.86413	0
grid, rbf kernel	0.973545	0.986595	1	0.973545	1	0
grid, rbf kernel synthetic samples	0.931217	0.964384	0.956522	0.972376	0.956522	0
grid, rbf kernel upsampled	0.962963	0.981132	0.98913	0.973262	0.98913	0
grid, sigmoid kernel	0.973545	0.986595	1	0.973545	1	0
grid, sigmoid kernel synthetic samples	0.677249	0.803859	0.679348	0.984252	0.679348	0.6
grid, sigmoid kernel upsampled	0.539683	0.696864	0.543478	0.970874	0.543478	0.4
random forest estimator	0.973545	0.986595	1	0.973545	1	0
random forest estimator synthetic samples	0.968254	0.983871	0.994565	0.973404	0.994565	0
random forest estimator, upsampled	0.962963	0.981132	0.98913	0.973262	0.98913	0
knn 10	0.973545	0.986595	1	0.973545	1	0
knn 10 synthetic samples	0.814815	0.896755	0.826087	0.980645	0.826087	0.4
knn 10 upsampled	0.899471	0.946779	0.918478	0.976879	0.918478	0.2

TABLE VI: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.941799	0.970027	1	0.941799	1	0
Logistic regression synthetic samples	0.714286	0.826923	0.724719	0.962687	0.724719	0.545455
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.941799	0.970027	1	0.941799	1	0
svm, linear kernel, synthetic samples	0.68254	0.803922	0.691011	0.960938	0.691011	0.545455
svm, linear kernel upsampled samples	0.772487	0.866873	0.786517	0.965517	0.786517	0.545455
svm, poly	0.941799	0.970027	1	0.941799	1	0
svm, poly synthetic samples	0.746032	0.85	0.764045	0.957746	0.764045	0.454545
svm, poly upsampled	0.835979	0.908555	0.865169	0.956522	0.865169	0.363636
grid, rbf kernel	0.941799	0.970027	1	0.941799	1	0
grid, rbf kernel synthetic samples	0.825397	0.902077	0.853933	0.955975	0.853933	0.363636
grid, rbf kernel upsampled	0.883598	0.936782	0.91573	0.958824	0.91573	0.363636
grid, sigmoid kernel	0.931217	0.964384	0.988764	0.941176	0.988764	0
grid, sigmoid kernel synthetic samples	0.62963	0.765101	0.640449	0.95	0.640449	0.454545
grid, sigmoid kernel upsampled	0.698413	0.81672	0.713483	0.954887	0.713483	0.454545
random forest estimator	0.941799	0.970027	1	0.941799	1	0
random forest estimator synthetic samples	0.89418	0.943182	0.932584	0.954023	0.932584	0.272727
random forest estimator, upsampled	0.931217	0.964187	0.983146	0.945946	0.983146	0.0909091
knn 10	0.941799	0.970027	1	0.941799	1	0
knn 10 synthetic samples	0.708995	0.826498	0.735955	0.942446	0.735955	0.272727
knn 10 upsampled	0.798942	0.886228	0.831461	0.948718	0.831461	0.272727

TABLE VII: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.830688	0.907514	0.987421	0.839572	0.987421	0
Logistic regression synthetic samples	0.68254	0.791667	0.716981	0.883721	0.716981	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.84127	0.913793	1	0.84127	1	0
svm, linear kernel, synthetic samples	0.714286	0.816327	0.754717	0.888889	0.754717	0.5
svm, linear kernel upsampled samples	0.677249	0.784452	0.698113	0.895161	0.698113	0.566667
svm, poly	0.84127	0.913793	1	0.84127	1	0
svm, poly synthetic samples	0.730159	0.827119	0.767296	0.897059	0.767296	0.533333
svm, poly upsampled	0.703704	0.808219	0.742138	0.887218	0.742138	0.5
grid, rbf kernel	0.84127	0.913793	1	0.84127	1	0
grid, rbf kernel synthetic samples	0.730159	0.831683	0.792453	0.875	0.792453	0.4
grid, rbf kernel upsampled	0.746032	0.842105	0.805031	0.882759	0.805031	0.433333
grid, sigmoid kernel	0.84127	0.913295	0.993711	0.84492	0.993711	0.0333333
grid, sigmoid kernel synthetic samples	0.714286	0.813793	0.742138	0.900763	0.742138	0.566667
grid, sigmoid kernel upsampled	0.708995	0.808362	0.72956	0.90625	0.72956	0.6
random forest estimator	0.84127	0.913793	1	0.84127	1	0
random forest estimator synthetic samples	0.783069	0.867314	0.842767	0.893333	0.842767	0.466667
random forest estimator, upsampled	0.820106	0.89375	0.899371	0.888199	0.899371	0.4
knn 10	0.835979	0.910663	0.993711	0.840426	0.993711	0
knn 10 synthetic samples	0.645503	0.761566	0.672956	0.877049	0.672956	0.5
knn 10 upsampled	0.693122	0.804054	0.748428	0.868613	0.748428	0.4

TABLE VIII: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.756614	0.849673	0.935252	0.778443	0.935252	0.26
Logistic regression synthetic samples	0.719577	0.802974	0.776978	0.830769	0.776978	0.56
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.751323	0.851735	0.971223	0.758427	0.971223	0.14
svm, linear kernel, synthetic samples	0.730159	0.815884	0.81295	0.818841	0.81295	0.5
svm, linear kernel upsampled samples	0.73545	0.818841	0.81295	0.824818	0.81295	0.52
svm, poly	0.719577	0.835913	0.971223	0.733696	0.971223	0.02
svm, poly synthetic samples	0.746032	0.824818	0.81295	0.837037	0.81295	0.56
svm, poly upsampled	0.730159	0.813187	0.798561	0.828358	0.798561	0.54
grid, rbf kernel	0.756614	0.853503	0.964029	0.765714	0.964029	0.18
grid, rbf kernel synthetic samples	0.730159	0.813187	0.798561	0.828358	0.798561	0.54
grid, rbf kernel upsampled	0.730159	0.815884	0.81295	0.818841	0.81295	0.5
grid, sigmoid kernel	0.73545	0.84375	0.971223	0.745856	0.971223	0.08
grid, sigmoid kernel synthetic samples	0.724868	0.807407	0.784173	0.832061	0.784173	0.56
grid, sigmoid kernel upsampled	0.687831	0.777358	0.741007	0.81746	0.741007	0.54
random forest estimator	0.761905	0.849498	0.913669	0.79375	0.913669	0.34
random forest estimator synthetic samples	0.719577	0.801498	0.769784	0.835938	0.769784	0.58
random forest estimator, upsampled	0.740741	0.819188	0.798561	0.840909	0.798561	0.58
knn 10	0.73545	0.837662	0.928058	0.763314	0.928058	0.2
knn 10 synthetic samples	0.661376	0.755725	0.71223	0.804878	0.71223	0.52
knn 10 upsampled	0.730159	0.815884	0.81295	0.818841	0.81295	0.5

TABLE IX: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.661376	0.721739	0.783019	0.669355	0.783019	0.506024
Logistic regression synthetic samples	0.634921	0.684932	0.707547	0.663717	0.707547	0.542169
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.656085	0.718615	0.783019	0.664	0.783019	0.493976
svm, linear kernel, synthetic samples	0.650794	0.707965	0.754717	0.666667	0.754717	0.518072
svm, linear kernel upsampled samples	0.661376	0.714286	0.754717	0.677966	0.754717	0.542169
svm, poly	0.650794	0.717949	0.792453	0.65625	0.792453	0.46988
svm, poly synthetic samples	0.645503	0.704846	0.754717	0.661157	0.754717	0.506024
svm, poly upsampled	0.656085	0.70852	0.745283	0.675214	0.745283	0.542169
grid, rbf kernel	0.650794	0.715517	0.783019	0.65873	0.783019	0.481928
grid, rbf kernel synthetic samples	0.666667	0.72	0.764151	0.680672	0.764151	0.542169
grid, rbf kernel upsampled	0.640212	0.701754	0.754717	0.655738	0.754717	0.493976
grid, sigmoid kernel	0.650794	0.733871	0.858491	0.640845	0.858491	0.385542
grid, sigmoid kernel synthetic samples	0.650794	0.715517	0.783019	0.65873	0.783019	0.481928
grid, sigmoid kernel upsampled	0.640212	0.701754	0.754717	0.655738	0.754717	0.493976
random forest estimator	0.661376	0.719298	0.773585	0.672131	0.773585	0.518072
random forest estimator synthetic samples	0.645503	0.694064	0.716981	0.672566	0.716981	0.554217
random forest estimator, upsampled	0.645503	0.699552	0.735849	0.666667	0.735849	0.53012
knn 10	0.619048	0.692308	0.764151	0.632812	0.764151	0.433735
knn 10 synthetic samples	0.603175	0.657534	0.679245	0.637168	0.679245	0.506024
knn 10 upsampled	0.571429	0.646288	0.698113	0.601626	0.698113	0.409639

TABLE X: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.983713	0.99179	1	0.983713	1	0
Logistic regression synthetic samples	0.697068	0.820809	0.705298	0.981567	0.705298	0.2
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.980456	0.990132	0.996689	0.98366	0.996689	0
svm, linear kernel, synthetic samples	0.644951	0.7833	0.652318	0.9801	0.652318	0.2
svm, linear kernel upsampled samples	0.674267	0.804688	0.682119	0.980952	0.682119	0.2
svm, poly	0.983713	0.99179	1	0.983713	1	0
svm, poly synthetic samples	0.618893	0.763636	0.625828	0.979275	0.625828	0.2
svm, poly upsampled	0.667752	0.8	0.675497	0.980769	0.675497	0.2
grid, rbf kernel	0.983713	0.99179	1	0.983713	1	0
grid, rbf kernel synthetic samples	0.726384	0.840304	0.731788	0.986607	0.731788	0.4
grid, rbf kernel upsampled	0.837134	0.910714	0.844371	0.988372	0.844371	0.4
grid, sigmoid kernel	0.983713	0.99179	1	0.983713	1	0
grid, sigmoid kernel synthetic samples	0.566775	0.721174	0.569536	0.982857	0.569536	0.4
grid, sigmoid kernel upsampled	0.560261	0.715789	0.562914	0.982659	0.562914	0.4
random forest estimator	0.983713	0.99179	1	0.983713	1	0
random forest estimator synthetic samples	0.944625	0.971524	0.960265	0.983051	0.960265	0
random forest estimator, upsampled	0.980456	0.990132	0.996689	0.98366	0.996689	0
knn 10	0.983713	0.99179	1	0.983713	1	0
knn 10 synthetic samples	0.762215	0.86406	0.768212	0.987234	0.768212	0.4
knn 10 upsampled	0.869707	0.93007	0.880795	0.985185	0.880795	0.2

TABLE XI: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.944625	0.971524	1	0.944625	1	0
Logistic regression synthetic samples	0.713355	0.826087	0.72069	0.967593	0.72069	0.588235
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.944625	0.971524	1	0.944625	1	0
svm, linear kernel, synthetic samples	0.716612	0.829746	0.731034	0.959276	0.731034	0.470588
svm, linear kernel upsampled samples	0.785016	0.87594	0.803448	0.96281	0.803448	0.470588
svm, poly	0.944625	0.971524	1	0.944625	1	0
svm, poly synthetic samples	0.7557	0.856046	0.768966	0.965368	0.768966	0.529412
svm, poly upsampled	0.820847	0.898711	0.841379	0.964427	0.841379	0.470588
grid, rbf kernel	0.944625	0.971524	1	0.944625	1	0
grid, rbf kernel synthetic samples	0.726384	0.836576	0.741379	0.959821	0.741379	0.470588
grid, rbf kernel upsampled	0.80456	0.888889	0.827586	0.96	0.827586	0.411765
grid, sigmoid kernel	0.947883	0.973064	0.996552	0.950658	0.996552	0.117647
grid, sigmoid kernel synthetic samples	0.680782	0.802419	0.686207	0.966019	0.686207	0.588235
grid, sigmoid kernel upsampled	0.57329	0.720682	0.582759	0.944134	0.582759	0.411765
random forest estimator	0.944625	0.971524	1	0.944625	1	0
random forest estimator synthetic samples	0.85342	0.919786	0.889655	0.95203	0.889655	0.235294
random forest estimator, upsampled	0.905537	0.950086	0.951724	0.948454	0.951724	0.117647
knn 10	0.947883	0.973154	1	0.947712	1	0.0588235
knn 10 synthetic samples	0.703583	0.821918	0.724138	0.950226	0.724138	0.352941
knn 10 upsampled	0.749186	0.852207	0.765517	0.961039	0.765517	0.470588

TABLE XII: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.80456	0.89011	0.972	0.820946	0.972	0.0701754
Logistic regression synthetic samples	0.667752	0.774336	0.7	0.866337	0.7	0.526316
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.811075	0.895683	0.996	0.813725	0.996	0
svm, linear kernel, synthetic samples	0.710098	0.809422	0.756	0.870968	0.756	0.508772
svm, linear kernel upsampled samples	0.684039	0.793177	0.744	0.849315	0.744	0.421053
svm, poly	0.811075	0.895683	0.996	0.813725	0.996	0
svm, poly synthetic samples	0.690554	0.794816	0.736	0.86385	0.736	0.491228
svm, poly upsampled	0.71987	0.821577	0.792	0.853448	0.792	0.403509
grid, rbf kernel	0.814332	0.897666	1	0.814332	1	0
grid, rbf kernel synthetic samples	0.697068	0.801706	0.752	0.858447	0.752	0.45614
grid, rbf kernel upsampled	0.723127	0.825462	0.804	0.848101	0.804	0.368421
grid, sigmoid kernel	0.807818	0.892139	0.976	0.821549	0.976	0.0701754
grid, sigmoid kernel synthetic samples	0.703583	0.80597	0.756	0.863014	0.756	0.473684
grid, sigmoid kernel upsampled	0.62215	0.725118	0.612	0.889535	0.612	0.666667
random forest estimator	0.811075	0.894928	0.988	0.817881	0.988	0.0350877
random forest estimator synthetic samples	0.732899	0.832653	0.816	0.85	0.816	0.368421
random forest estimator, upsampled	0.791531	0.875	0.896	0.854962	0.896	0.333333
knn 10	0.820847	0.899452	0.984	0.828283	0.984	0.105263
knn 10 synthetic samples	0.635179	0.745455	0.656	0.863158	0.656	0.54386
knn 10 upsampled	0.62215	0.73991	0.66	0.841837	0.66	0.45614

TABLE XIII: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.687296	0.785714	0.875622	0.712551	0.875622	0.330189
Logistic regression synthetic samples	0.641694	0.708995	0.666667	0.757062	0.666667	0.59434
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.693811	0.79476	0.905473	0.708171	0.905473	0.292453
svm, linear kernel, synthetic samples	0.664495	0.732468	0.701493	0.766304	0.701493	0.59434
svm, linear kernel upsampled samples	0.648208	0.721649	0.696517	0.748663	0.696517	0.556604
svm, poly	0.690554	0.794816	0.915423	0.70229	0.915423	0.264151
svm, poly synthetic samples	0.661238	0.73057	0.701493	0.762162	0.701493	0.584906
svm, poly upsampled	0.654723	0.723958	0.691542	0.759563	0.691542	0.584906
grid, rbf kernel	0.697068	0.791946	0.880597	0.719512	0.880597	0.349057
grid, rbf kernel synthetic samples	0.654723	0.726804	0.701493	0.754011	0.701493	0.566038
grid, rbf kernel upsampled	0.651466	0.724936	0.701493	0.75	0.701493	0.556604
grid, sigmoid kernel	0.648208	0.728643	0.721393	0.736041	0.721393	0.509434
grid, sigmoid kernel synthetic samples	0.661238	0.729167	0.696517	0.765027	0.696517	0.59434
grid, sigmoid kernel upsampled	0.618893	0.672269	0.597015	0.769231	0.597015	0.660377
random forest estimator	0.65798	0.756381	0.810945	0.708696	0.810945	0.367925
random forest estimator synthetic samples	0.638436	0.707124	0.666667	0.752809	0.666667	0.584906
random forest estimator, upsampled	0.661238	0.736041	0.721393	0.751295	0.721393	0.54717
knn 10	0.644951	0.755056	0.835821	0.688525	0.835821	0.283019
knn 10 synthetic samples	0.596091	0.670213	0.626866	0.72	0.626866	0.537736
knn 10 upsampled	0.625407	0.710327	0.701493	0.719388	0.701493	0.481132

TABLE XIV: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.648208	0.647059	0.63871	0.655629	0.63871	0.657895
Logistic regression synthetic samples	0.638436	0.662614	0.703226	0.626437	0.703226	0.572368
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.635179	0.641026	0.645161	0.636943	0.645161	0.625
svm, linear kernel, synthetic samples	0.625407	0.658754	0.716129	0.60989	0.716129	0.532895
svm, linear kernel upsampled samples	0.612378	0.638298	0.677419	0.603448	0.677419	0.546053
svm, poly	0.651466	0.64918	0.63871	0.66	0.63871	0.664474
svm, poly synthetic samples	0.638436	0.664653	0.709677	0.625	0.709677	0.565789
svm, poly upsampled	0.635179	0.656442	0.690323	0.625731	0.690323	0.578947
grid, rbf kernel	0.641694	0.604317	0.541935	0.682927	0.541935	0.743421
grid, rbf kernel synthetic samples	0.638436	0.640777	0.63871	0.642857	0.63871	0.638158
grid, rbf kernel upsampled	0.599349	0.630631	0.677419	0.589888	0.677419	0.519737
grid, sigmoid kernel	0.638436	0.654206	0.677419	0.63253	0.677419	0.598684
grid, sigmoid kernel synthetic samples	0.615635	0.656977	0.729032	0.597884	0.729032	0.5
grid, sigmoid kernel upsampled	0.635179	0.662651	0.709677	0.621469	0.709677	0.559211
random forest estimator	0.654723	0.631944	0.587097	0.684211	0.587097	0.723684
random forest estimator synthetic samples	0.644951	0.640264	0.625806	0.655405	0.625806	0.664474
random forest estimator, upsampled	0.631922	0.647975	0.670968	0.626506	0.670968	0.592105
knn 10	0.609121	0.591837	0.56129	0.625899	0.56129	0.657895
knn 10 synthetic samples	0.615635	0.628931	0.645161	0.613497	0.645161	0.585526
knn 10 upsampled	0.570033	0.574194	0.574194	0.574194	0.574194	0.565789

TABLE XV: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.968254	0.983871	0.994565	0.973404	0.994565	0
Logistic regression synthetic samples	0.804233	0.890855	0.820652	0.974194	0.820652	0.2
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.973545	0.986595	1	0.973545	1	0
svm, linear kernel, synthetic samples	0.783069	0.877612	0.798913	0.97351	0.798913	0.2
svm, linear kernel upsampled samples	0.796296	0.885926	0.8125	0.973941	0.8125	0.2
svm, poly	0.970899	0.985235	0.997283	0.973475	0.997283	0
svm, poly synthetic samples	0.796296	0.885926	0.8125	0.973941	0.8125	0.2
svm, poly upsampled	0.806878	0.892489	0.82337	0.974277	0.82337	0.2
grid, rbf kernel	0.973545	0.986595	1	0.973545	1	0
grid, rbf kernel synthetic samples	0.87037	0.930496	0.891304	0.973294	0.891304	0.1
grid, rbf kernel upsampled	0.89418	0.943978	0.915761	0.973988	0.915761	0.1
grid, sigmoid kernel	0.965608	0.982456	0.98913	0.975871	0.98913	0.1
grid, sigmoid kernel synthetic samples	0.579365	0.730964	0.586957	0.96861	0.586957	0.3
grid, sigmoid kernel upsampled	0.441799	0.605607	0.440217	0.97006	0.440217	0.5
random forest estimator	0.973545	0.986595	1	0.973545	1	0
random forest estimator synthetic samples	0.933862	0.9658	0.959239	0.972452	0.959239	0
random forest estimator, upsampled	0.955026	0.976996	0.980978	0.973046	0.980978	0
knn 10	0.973545	0.986595	1	0.973545	1	0
knn 10 synthetic samples	0.81746	0.898975	0.834239	0.974603	0.834239	0.2
knn 10 upsampled	0.891534	0.942496	0.913043	0.973913	0.913043	0.1

TABLE XVI: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.936508	0.967213	0.997183	0.938992	0.997183	0
Logistic regression synthetic samples	0.656085	0.784768	0.667606	0.951807	0.667606	0.478261
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.939153	0.968622	1	0.939153	1	0
svm, linear kernel, synthetic samples	0.661376	0.788079	0.670423	0.955823	0.670423	0.521739
svm, linear kernel upsampled samples	0.724868	0.836991	0.752113	0.943463	0.752113	0.304348
svm, poly	0.931217	0.964384	0.991549	0.938667	0.991549	0
svm, poly synthetic samples	0.671958	0.796053	0.68169	0.956522	0.68169	0.521739
svm, poly upsampled	0.693122	0.814103	0.715493	0.944238	0.715493	0.347826
grid, rbf kernel	0.939153	0.968622	1	0.939153	1	0
grid, rbf kernel synthetic samples	0.753968	0.855814	0.777465	0.951724	0.777465	0.391304
grid, rbf kernel upsampled	0.78836	0.878788	0.816901	0.95082	0.816901	0.347826
grid, sigmoid kernel	0.925926	0.961538	0.985915	0.938338	0.985915	0
grid, sigmoid kernel synthetic samples	0.531746	0.681081	0.532394	0.945	0.532394	0.521739
grid, sigmoid kernel upsampled	0.568783	0.714536	0.574648	0.944444	0.574648	0.478261
random forest estimator	0.939153	0.968622	1	0.939153	1	0
random forest estimator synthetic samples	0.843915	0.915108	0.895775	0.935294	0.895775	0.0434783
random forest estimator, upsampled	0.910053	0.952778	0.966197	0.939726	0.966197	0.0434783
knn 10	0.939153	0.968622	1	0.939153	1	0
knn 10 synthetic samples	0.661376	0.790164	0.678873	0.945098	0.678873	0.391304
knn 10 upsampled	0.68254	0.809524	0.71831	0.927273	0.71831	0.130435

TABLE XVII: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.812169	0.894815	0.983713	0.820652	0.983713	0.0704225
Logistic regression synthetic samples	0.653439	0.761384	0.680782	0.863636	0.680782	0.535211
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.812169	0.89635	1	0.812169	1	0
svm, linear kernel, synthetic samples	0.650794	0.76087	0.684039	0.857143	0.684039	0.507042
svm, linear kernel upsampled samples	0.669312	0.772313	0.690554	0.876033	0.690554	0.577465
svm, poly	0.812169	0.89635	1	0.812169	1	0
svm, poly synthetic samples	0.634921	0.747253	0.664495	0.853556	0.664495	0.507042
svm, poly upsampled	0.645503	0.753676	0.667752	0.864979	0.667752	0.549296
grid, rbf kernel	0.812169	0.89635	1	0.812169	1	0
grid, rbf kernel synthetic samples	0.60582	0.724584	0.638436	0.837607	0.638436	0.464789
grid, rbf kernel upsampled	0.637566	0.753153	0.680782	0.842742	0.680782	0.450704
grid, sigmoid kernel	0.806878	0.892805	0.990228	0.812834	0.990228	0.0140845
grid, sigmoid kernel synthetic samples	0.632275	0.742115	0.651466	0.862069	0.651466	0.549296
grid, sigmoid kernel upsampled	0.611111	0.723164	0.625407	0.857143	0.625407	0.549296
random forest estimator	0.814815	0.897661	1	0.814324	1	0.0140845
random forest estimator synthetic samples	0.687831	0.795139	0.745928	0.851301	0.745928	0.43662
random forest estimator, upsampled	0.730159	0.831683	0.820847	0.842809	0.820847	0.338028
knn 10	0.806878	0.892489	0.986971	0.814516	0.986971	0.028169
knn 10 synthetic samples	0.555556	0.676923	0.57329	0.826291	0.57329	0.478873
knn 10 upsampled	0.621693	0.74141	0.667752	0.833333	0.667752	0.422535

TABLE XVIII: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.653439	0.757856	0.861345	0.676568	0.861345	0.3
Logistic regression synthetic samples	0.611111	0.676923	0.647059	0.709677	0.647059	0.55
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.656085	0.762774	0.878151	0.674194	0.878151	0.278571
svm, linear kernel, synthetic samples	0.587302	0.656388	0.62605	0.689815	0.62605	0.521429
svm, linear kernel upsampled samples	0.608466	0.689076	0.689076	0.689076	0.689076	0.471429
svm, poly	0.640212	0.758007	0.894958	0.657407	0.894958	0.207143
svm, poly synthetic samples	0.600529	0.666667	0.634454	0.702326	0.634454	0.542857
svm, poly upsampled	0.616402	0.698545	0.705882	0.691358	0.705882	0.464286
grid, rbf kernel	0.632275	0.747731	0.865546	0.658147	0.865546	0.235714
grid, rbf kernel synthetic samples	0.579365	0.637813	0.588235	0.696517	0.588235	0.564286
grid, rbf kernel upsampled	0.608466	0.685106	0.676471	0.693966	0.676471	0.492857
grid, sigmoid kernel	0.619048	0.712	0.747899	0.679389	0.747899	0.4
grid, sigmoid kernel synthetic samples	0.592593	0.65625	0.617647	0.7	0.617647	0.55
grid, sigmoid kernel upsampled	0.592593	0.648402	0.596639	0.71	0.596639	0.585714
random forest estimator	0.656085	0.752852	0.831933	0.6875	0.831933	0.357143
random forest estimator synthetic samples	0.603175	0.662162	0.617647	0.713592	0.617647	0.578571
random forest estimator, upsampled	0.619048	0.697479	0.697479	0.697479	0.697479	0.485714
knn 10	0.592593	0.703846	0.768908	0.648936	0.768908	0.292857
knn 10 synthetic samples	0.584656	0.645598	0.60084	0.697561	0.60084	0.557143
knn 10 upsampled	0.589947	0.665227	0.647059	0.684444	0.647059	0.492857

TABLE XIX: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.597884	0.555556	0.552326	0.558824	0.552326	0.635922
Logistic regression synthetic samples	0.555556	0.548387	0.593023	0.51	0.593023	0.524272
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.589947	0.555874	0.563953	0.548023	0.563953	0.61165
svm, linear kernel, synthetic samples	0.539683	0.534759	0.581395	0.49505	0.581395	0.504854
svm, linear kernel upsampled samples	0.563492	0.584383	0.674419	0.515556	0.674419	0.470874
svm, poly	0.595238	0.559078	0.563953	0.554286	0.563953	0.621359
svm, poly synthetic samples	0.547619	0.544	0.593023	0.502463	0.593023	0.509709
svm, poly upsampled	0.566138	0.58794	0.680233	0.517699	0.680233	0.470874
grid, rbf kernel	0.611111	0.553191	0.52907	0.579618	0.52907	0.679612
grid, rbf kernel synthetic samples	0.574074	0.556474	0.587209	0.528796	0.587209	0.563107
grid, rbf kernel upsampled	0.568783	0.569921	0.627907	0.521739	0.627907	0.519417
grid, sigmoid kernel	0.597884	0.560694	0.563953	0.557471	0.563953	0.626214
grid, sigmoid kernel synthetic samples	0.57672	0.585492	0.656977	0.528037	0.656977	0.509709
grid, sigmoid kernel upsampled	0.568783	0.603406	0.72093	0.518828	0.72093	0.441748
random forest estimator	0.640212	0.552632	0.488372	0.636364	0.488372	0.76699
random forest estimator synthetic samples	0.642857	0.589666	0.563953	0.617834	0.563953	0.708738
random forest estimator, upsampled	0.608466	0.610526	0.674419	0.557692	0.674419	0.553398
knn 10	0.587302	0.52439	0.5	0.551282	0.5	0.660194
knn 10 synthetic samples	0.563492	0.537815	0.55814	0.518919	0.55814	0.567961
knn 10 upsampled	0.550265	0.535519	0.569767	0.505155	0.569767	0.533981

TABLE XX: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.973301	0.98647	1	0.973301	1	0
Logistic regression synthetic samples	0.708738	0.827586	0.718204	0.976271	0.718204	0.363636
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.973301	0.98647	1	0.973301	1	0
svm, linear kernel, synthetic samples	0.669903	0.8	0.678304	0.97491	0.678304	0.363636
svm, linear kernel upsampled samples	0.718447	0.833811	0.725686	0.979798	0.725686	0.454545
svm, poly	0.973301	0.98647	1	0.973301	1	0
svm, poly synthetic samples	0.701456	0.822511	0.710723	0.976027	0.710723	0.363636
svm, poly upsampled	0.735437	0.84495	0.740648	0.983444	0.740648	0.545455
grid, rbf kernel	0.973301	0.98647	1	0.973301	1	0
grid, rbf kernel synthetic samples	0.871359	0.930537	0.885287	0.980663	0.885287	0.363636
grid, rbf kernel upsampled	0.88835	0.940722	0.910224	0.973333	0.910224	0.0909091
grid, sigmoid kernel	0.970874	0.985222	0.997506	0.973236	0.997506	0
grid, sigmoid kernel synthetic samples	0.570388	0.72126	0.571072	0.978632	0.571072	0.545455
grid, sigmoid kernel upsampled	0.56068	0.7104	0.553616	0.991071	0.553616	0.818182
random forest estimator	0.973301	0.98647	1	0.973301	1	0
random forest estimator synthetic samples	0.941748	0.97	0.967581	0.972431	0.967581	0
random forest estimator, upsampled	0.973301	0.98647	1	0.973301	1	0
knn 10	0.973301	0.98647	1	0.973301	1	0
knn 10 synthetic samples	0.779126	0.873786	0.785536	0.984375	0.785536	0.545455
knn 10 upsampled	0.890777	0.941634	0.905237	0.981081	0.905237	0.363636

TABLE XXI: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.917476	0.956962	0.997361	0.919708	0.997361	0
Logistic regression synthetic samples	0.674757	0.796353	0.691293	0.939068	0.691293	0.484848
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.919903	0.958281	1	0.919903	1	0
svm, linear kernel, synthetic samples	0.63835	0.766823	0.646438	0.942308	0.646438	0.545455
svm, linear kernel upsampled samples	0.769417	0.864479	0.799472	0.940994	0.799472	0.424242
svm, poly	0.917476	0.956962	0.997361	0.919708	0.997361	0
svm, poly synthetic samples	0.669903	0.793939	0.691293	0.932384	0.691293	0.424242
svm, poly upsampled	0.786408	0.876751	0.825858	0.934328	0.825858	0.333333
grid, rbf kernel	0.919903	0.958281	1	0.919903	1	0
grid, rbf kernel synthetic samples	0.650485	0.781155	0.6781	0.921147	0.6781	0.333333
grid, rbf kernel upsampled	0.752427	0.855114	0.794195	0.926154	0.794195	0.272727
grid, sigmoid kernel	0.912621	0.953846	0.98153	0.927681	0.98153	0.121212
grid, sigmoid kernel synthetic samples	0.604369	0.740032	0.612137	0.935484	0.612137	0.515152
grid, sigmoid kernel upsampled	0.565534	0.707993	0.572559	0.92735	0.572559	0.484848
random forest estimator	0.919903	0.958281	1	0.919903	1	0
random forest estimator synthetic samples	0.834951	0.909574	0.902375	0.91689	0.902375	0.0606061
random forest estimator, upsampled	0.902913	0.94898	0.98153	0.918519	0.98153	0
knn 10	0.919903	0.958281	1	0.919903	1	0
knn 10 synthetic samples	0.67233	0.79638	0.69657	0.929577	0.69657	0.393939
knn 10 upsampled	0.745146	0.848921	0.778364	0.933544	0.778364	0.363636

TABLE XXII: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.786408	0.879121	0.984615	0.794045	0.984615	0.045977
Logistic regression synthetic samples	0.63835	0.741768	0.658462	0.849206	0.658462	0.563218
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.788835	0.881954	1	0.788835	1	0
svm, linear kernel, synthetic samples	0.640777	0.736655	0.636923	0.873418	0.636923	0.655172
svm, linear kernel upsampled samples	0.665049	0.763699	0.686154	0.861004	0.686154	0.586207
svm, poly	0.788835	0.881954	1	0.788835	1	0
svm, poly synthetic samples	0.665049	0.762069	0.68	0.866667	0.68	0.609195
svm, poly upsampled	0.686893	0.78392	0.72	0.860294	0.72	0.563218
grid, rbf kernel	0.788835	0.881954	1	0.788835	1	0
grid, rbf kernel synthetic samples	0.699029	0.792642	0.729231	0.868132	0.729231	0.586207
grid, rbf kernel upsampled	0.706311	0.800659	0.747692	0.861702	0.747692	0.551724
grid, sigmoid kernel	0.774272	0.872428	0.978462	0.787129	0.978462	0.0114943
grid, sigmoid kernel synthetic samples	0.587379	0.692029	0.587692	0.84141	0.587692	0.586207
grid, sigmoid kernel upsampled	0.606796	0.711744	0.615385	0.843882	0.615385	0.574713
random forest estimator	0.788835	0.881954	1	0.788835	1	0
random forest estimator synthetic samples	0.723301	0.821875	0.809231	0.834921	0.809231	0.402299
random forest estimator, upsampled	0.759709	0.853333	0.886154	0.822857	0.886154	0.287356
knn 10	0.788835	0.880985	0.990769	0.793103	0.990769	0.0344828
knn 10 synthetic samples	0.601942	0.714286	0.630769	0.823293	0.630769	0.494253
knn 10 upsampled	0.648058	0.760331	0.707692	0.821429	0.707692	0.425287

TABLE XXIII: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.643204	0.759411	0.885496	0.664756	0.885496	0.22
Logistic regression synthetic samples	0.652913	0.721248	0.706107	0.737052	0.706107	0.56
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.628641	0.766412	0.958015	0.638677	0.958015	0.0533333
svm, linear kernel, synthetic samples	0.645631	0.706827	0.671756	0.745763	0.671756	0.6
svm, linear kernel upsampled samples	0.660194	0.727626	0.71374	0.742063	0.71374	0.566667
svm, poly	0.628641	0.76783	0.965649	0.63728	0.965649	0.04
svm, poly synthetic samples	0.621359	0.681633	0.637405	0.732456	0.637405	0.593333
svm, poly upsampled	0.645631	0.713725	0.694656	0.733871	0.694656	0.56
grid, rbf kernel	0.631068	0.764706	0.942748	0.643229	0.942748	0.0866667
grid, rbf kernel synthetic samples	0.614078	0.669439	0.614504	0.73516	0.614504	0.613333
grid, rbf kernel upsampled	0.621359	0.677686	0.625954	0.738739	0.625954	0.613333
grid, sigmoid kernel	0.623786	0.734134	0.816794	0.666667	0.816794	0.286667
grid, sigmoid kernel synthetic samples	0.606796	0.673387	0.637405	0.713675	0.637405	0.553333
grid, sigmoid kernel upsampled	0.616505	0.673554	0.622137	0.734234	0.622137	0.606667
random forest estimator	0.648058	0.75793	0.866412	0.673591	0.866412	0.266667
random forest estimator synthetic samples	0.618932	0.680244	0.637405	0.729258	0.637405	0.586667
random forest estimator, upsampled	0.645631	0.721374	0.721374	0.721374	0.721374	0.513333
knn 10	0.61165	0.726962	0.812977	0.657407	0.812977	0.26
knn 10 synthetic samples	0.553398	0.616667	0.564885	0.678899	0.564885	0.533333
knn 10 upsampled	0.580097	0.651911	0.618321	0.689362	0.618321	0.513333

TABLE XXIV: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.621359	0.561798	0.52356	0.606061	0.52356	0.705882
Logistic regression synthetic samples	0.61165	0.620853	0.685864	0.5671	0.685864	0.547511
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.609223	0.572944	0.565445	0.580645	0.565445	0.647059
svm, linear kernel, synthetic samples	0.587379	0.606481	0.685864	0.543568	0.685864	0.502262
svm, linear kernel upsampled samples	0.599515	0.618938	0.701571	0.553719	0.701571	0.511312
svm, poly	0.616505	0.561111	0.528796	0.597633	0.528796	0.692308
svm, poly synthetic samples	0.599515	0.615385	0.691099	0.554622	0.691099	0.520362
svm, poly upsampled	0.606796	0.64	0.753927	0.555985	0.753927	0.479638
grid, rbf kernel	0.633495	0.541033	0.465969	0.644928	0.465969	0.778281
grid, rbf kernel synthetic samples	0.628641	0.618454	0.649215	0.590476	0.649215	0.61086
grid, rbf kernel upsampled	0.621359	0.632075	0.701571	0.575107	0.701571	0.552036
grid, sigmoid kernel	0.582524	0.544974	0.539267	0.550802	0.539267	0.61991
grid, sigmoid kernel synthetic samples	0.604369	0.607229	0.659686	0.5625	0.659686	0.556561
grid, sigmoid kernel upsampled	0.597087	0.622727	0.717277	0.550201	0.717277	0.493213
random forest estimator	0.614078	0.533724	0.47644	0.606667	0.47644	0.733032
random forest estimator synthetic samples	0.63835	0.600536	0.586387	0.615385	0.586387	0.683258
random forest estimator, upsampled	0.623786	0.638695	0.717277	0.57563	0.717277	0.542986
knn 10	0.599515	0.532578	0.492147	0.580247	0.492147	0.692308
knn 10 synthetic samples	0.614078	0.599496	0.623037	0.57767	0.623037	0.606335
knn 10 upsampled	0.592233	0.586207	0.623037	0.553488	0.623037	0.565611

TABLE XXV: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.974886	0.987283	0.997664	0.977117	0.997664	0
Logistic regression synthetic samples	0.73516	0.846154	0.745327	0.978528	0.745327	0.3
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.977169	0.988453	1	0.977169	1	0
svm, linear kernel, synthetic samples	0.675799	0.804945	0.684579	0.976667	0.684579	0.3
svm, linear kernel upsampled samples	0.705479	0.82544	0.712617	0.980707	0.712617	0.4
svm, poly	0.977169	0.988453	1	0.977169	1	0
svm, poly synthetic samples	0.721461	0.836461	0.728972	0.981132	0.728972	0.4
svm, poly upsampled	0.780822	0.875648	0.78972	0.982558	0.78972	0.4
grid, rbf kernel	0.977169	0.988453	1	0.977169	1	0
grid, rbf kernel synthetic samples	0.913242	0.954545	0.932243	0.977941	0.932243	0.1
grid, rbf kernel upsampled	0.913242	0.954545	0.932243	0.977941	0.932243	0.1
grid, sigmoid kernel	0.974886	0.987254	0.995327	0.97931	0.995327	0.1
grid, sigmoid kernel synthetic samples	0.586758	0.735766	0.588785	0.980545	0.588785	0.5
grid, sigmoid kernel upsampled	0.531963	0.690799	0.535047	0.974468	0.535047	0.4
random forest estimator	0.977169	0.988453	1	0.977169	1	0
random forest estimator synthetic samples	0.947489	0.972909	0.964953	0.980998	0.964953	0.2
random forest estimator, upsampled	0.977169	0.988426	0.997664	0.979358	0.997664	0.1
knn 10	0.977169	0.988453	1	0.977169	1	0
knn 10 synthetic samples	0.794521	0.88491	0.808411	0.977401	0.808411	0.2
knn 10 upsampled	0.89726	0.945455	0.911215	0.982368	0.911215	0.3

TABLE XXVI: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.936073	0.966981	0.995146	0.940367	0.995146	0
Logistic regression synthetic samples	0.616438	0.757225	0.635922	0.935714	0.635922	0.307692
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.940639	0.969412	1	0.940639	1	0
svm, linear kernel, synthetic samples	0.648402	0.78187	0.669903	0.938776	0.669903	0.307692
svm, linear kernel upsampled samples	0.648402	0.782486	0.67233	0.935811	0.67233	0.269231
svm, poly	0.940639	0.969412	1	0.940639	1	0
svm, poly synthetic samples	0.639269	0.775568	0.662621	0.934932	0.662621	0.269231
svm, poly upsampled	0.687215	0.811554	0.716019	0.936508	0.716019	0.230769
grid, rbf kernel	0.940639	0.969412	1	0.940639	1	0
grid, rbf kernel synthetic samples	0.714612	0.830393	0.742718	0.941538	0.742718	0.269231
grid, rbf kernel upsampled	0.769406	0.867628	0.803398	0.94302	0.803398	0.230769
grid, sigmoid kernel	0.926941	0.961814	0.978155	0.946009	0.978155	0.115385
grid, sigmoid kernel synthetic samples	0.547945	0.699088	0.558252	0.934959	0.558252	0.384615
grid, sigmoid kernel upsampled	0.586758	0.731852	0.599515	0.939163	0.599515	0.384615
random forest estimator	0.940639	0.969412	1	0.940639	1	0
random forest estimator synthetic samples	0.8379	0.911361	0.885922	0.938303	0.885922	0.0769231
random forest estimator, upsampled	0.920091	0.958284	0.975728	0.941452	0.975728	0.0384615
knn 10	0.940639	0.969412	1	0.940639	1	0
knn 10 synthetic samples	0.682648	0.805594	0.699029	0.950495	0.699029	0.423077
knn 10 upsampled	0.742009	0.847914	0.764563	0.951662	0.764563	0.384615

TABLE XXVII: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.812785	0.895674	0.98324	0.82243	0.98324	0.05
Logistic regression synthetic samples	0.573059	0.695935	0.597765	0.832685	0.597765	0.4625
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.817352	0.899244	0.997207	0.818807	0.997207	0.0125
svm, linear kernel, synthetic samples	0.557078	0.672297	0.555866	0.850427	0.555866	0.5625
svm, linear kernel upsampled samples	0.531963	0.658902	0.553073	0.814815	0.553073	0.4375
svm, poly	0.815068	0.897856	0.994413	0.818391	0.994413	0.0125
svm, poly synthetic samples	0.541096	0.65641	0.536313	0.845815	0.536313	0.5625
svm, poly upsampled	0.570776	0.686667	0.575419	0.85124	0.575419	0.55
grid, rbf kernel	0.817352	0.899497	1	0.817352	1	0
grid, rbf kernel synthetic samples	0.605023	0.715928	0.608939	0.868526	0.608939	0.5875
grid, rbf kernel upsampled	0.621005	0.733974	0.639665	0.860902	0.639665	0.5375
grid, sigmoid kernel	0.794521	0.883721	0.955307	0.822115	0.955307	0.075
grid, sigmoid kernel synthetic samples	0.525114	0.646259	0.530726	0.826087	0.530726	0.5
grid, sigmoid kernel upsampled	0.543379	0.669967	0.567039	0.818548	0.567039	0.4375
random forest estimator	0.817352	0.899497	1	0.817352	1	0
random forest estimator synthetic samples	0.664384	0.781575	0.734637	0.834921	0.734637	0.35
random forest estimator, upsampled	0.753425	0.849582	0.851955	0.847222	0.851955	0.3125
knn 10	0.817352	0.898734	0.99162	0.821759	0.99162	0.0375
knn 10 synthetic samples	0.547945	0.667785	0.555866	0.836134	0.555866	0.5125
knn 10 upsampled	0.634703	0.752322	0.678771	0.84375	0.678771	0.4375

TABLE XXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.659817	0.771121	0.874564	0.68956	0.874564	0.251656
Logistic regression synthetic samples	0.591324	0.657744	0.599303	0.728814	0.599303	0.576159
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.6621	0.79096	0.97561	0.665083	0.97561	0.0662252
svm, linear kernel, synthetic samples	0.598174	0.660232	0.595819	0.74026	0.595819	0.602649
svm, linear kernel upsampled samples	0.593607	0.661597	0.606272	0.728033	0.606272	0.569536
svm, poly	0.659817	0.788652	0.968641	0.665072	0.968641	0.0728477
svm, poly synthetic samples	0.614155	0.671845	0.602787	0.758772	0.602787	0.635762
svm, poly upsampled	0.586758	0.648544	0.581882	0.732456	0.581882	0.596026
grid, rbf kernel	0.666667	0.783383	0.919861	0.682171	0.919861	0.18543
grid, rbf kernel synthetic samples	0.600457	0.653465	0.574913	0.756881	0.574913	0.649007
grid, rbf kernel upsampled	0.586758	0.655238	0.599303	0.722689	0.599303	0.562914
grid, sigmoid kernel	0.652968	0.763975	0.857143	0.689076	0.857143	0.264901
grid, sigmoid kernel synthetic samples	0.559361	0.629559	0.571429	0.700855	0.571429	0.536424
grid, sigmoid kernel upsampled	0.570776	0.635659	0.571429	0.716157	0.571429	0.569536
random forest estimator	0.650685	0.758294	0.836237	0.693642	0.836237	0.298013
random forest estimator synthetic samples	0.593607	0.661597	0.606272	0.728033	0.606272	0.569536
random forest estimator, upsampled	0.609589	0.69627	0.682927	0.710145	0.682927	0.470199
knn 10	0.641553	0.750397	0.8223	0.690058	0.8223	0.298013
knn 10 synthetic samples	0.568493	0.63301	0.567944	0.714912	0.567944	0.569536
knn 10 upsampled	0.575342	0.655556	0.616725	0.699605	0.616725	0.496689

TABLE XXIX: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.598174	0.505618	0.441176	0.592105	0.441176	0.735043
Logistic regression synthetic samples	0.600457	0.595843	0.632353	0.563319	0.632353	0.57265
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.605023	0.526027	0.470588	0.596273	0.470588	0.722222
svm, linear kernel, synthetic samples	0.573059	0.587196	0.651961	0.534137	0.651961	0.504274
svm, linear kernel upsampled samples	0.591324	0.603104	0.666667	0.550607	0.666667	0.525641
svm, poly	0.609589	0.531507	0.47549	0.602484	0.47549	0.726496
svm, poly synthetic samples	0.579909	0.6	0.676471	0.539062	0.676471	0.495726
svm, poly upsampled	0.600457	0.617068	0.691176	0.557312	0.691176	0.521368
grid, rbf kernel	0.598174	0.494253	0.421569	0.597222	0.421569	0.752137
grid, rbf kernel synthetic samples	0.616438	0.611111	0.647059	0.578947	0.647059	0.589744
grid, rbf kernel upsampled	0.614155	0.620225	0.676471	0.572614	0.676471	0.559829
grid, sigmoid kernel	0.56621	0.40625	0.318627	0.560345	0.318627	0.782051
grid, sigmoid kernel synthetic samples	0.559361	0.562358	0.607843	0.523207	0.607843	0.517094
grid, sigmoid kernel upsampled	0.557078	0.566964	0.622549	0.520492	0.622549	0.5
random forest estimator	0.621005	0.528409	0.455882	0.628378	0.455882	0.764957
random forest estimator synthetic samples	0.634703	0.591837	0.568627	0.617021	0.568627	0.692308
random forest estimator, upsampled	0.605023	0.605923	0.651961	0.565957	0.651961	0.564103
knn 10	0.559361	0.501292	0.47549	0.530055	0.47549	0.632479
knn 10 synthetic samples	0.568493	0.569476	0.612745	0.531915	0.612745	0.529915
knn 10 upsampled	0.557078	0.566964	0.622549	0.520492	0.622549	0.5

TABLE XXX: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.975771	0.987737	1	0.975771	1	0
Logistic regression synthetic samples	0.709251	0.828571	0.72009	0.975535	0.72009	0.272727
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.975771	0.987737	1	0.975771	1	0
svm, linear kernel, synthetic samples	0.662996	0.795728	0.672686	0.973856	0.672686	0.272727
svm, linear kernel upsampled samples	0.669604	0.800532	0.679458	0.97411	0.679458	0.272727
svm, poly	0.975771	0.987737	1	0.975771	1	0
svm, poly synthetic samples	0.72467	0.839125	0.735892	0.976048	0.735892	0.272727
svm, poly upsampled	0.770925	0.87	0.785553	0.97479	0.785553	0.181818
grid, rbf kernel	0.975771	0.987737	1	0.975771	1	0
grid, rbf kernel synthetic samples	0.865639	0.927811	0.884876	0.975124	0.884876	0.0909091
grid, rbf kernel upsampled	0.874449	0.93302	0.896163	0.973039	0.896163	0
grid, sigmoid kernel	0.971366	0.985475	0.995485	0.975664	0.995485	0
grid, sigmoid kernel synthetic samples	0.555066	0.708092	0.553047	0.983936	0.553047	0.636364
grid, sigmoid kernel upsampled	0.555066	0.711429	0.562077	0.968872	0.562077	0.272727
random forest estimator	0.975771	0.987737	1	0.975771	1	0
random forest estimator synthetic samples	0.947137	0.972851	0.970655	0.975057	0.970655	0
random forest estimator, upsampled	0.973568	0.986607	0.997743	0.975717	0.997743	0
knn 10	0.975771	0.987737	1	0.975771	1	0
knn 10 synthetic samples	0.784141	0.878713	0.801354	0.972603	0.801354	0.0909091
knn 10 upsampled	0.894273	0.944186	0.916479	0.973621	0.916479	0

TABLE XXXI: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.920705	0.958525	0.997602	0.922395	0.997602	0.0540541
Logistic regression synthetic samples	0.643172	0.773109	0.661871	0.929293	0.661871	0.432432
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.920705	0.958525	0.997602	0.922395	0.997602	0.0540541
svm, linear kernel, synthetic samples	0.590308	0.728863	0.59952	0.929368	0.59952	0.486486
svm, linear kernel upsampled samples	0.627753	0.760962	0.645084	0.927586	0.645084	0.432432
svm, poly	0.920705	0.958525	0.997602	0.922395	0.997602	0.0540541
svm, poly synthetic samples	0.614537	0.747475	0.621103	0.938406	0.621103	0.540541
svm, poly upsampled	0.662996	0.787204	0.678657	0.937086	0.678657	0.486486
grid, rbf kernel	0.918502	0.95752	1	0.918502	1	0
grid, rbf kernel synthetic samples	0.687225	0.807588	0.714628	0.928349	0.714628	0.378378
grid, rbf kernel upsampled	0.795154	0.882129	0.834532	0.935484	0.834532	0.351351
grid, sigmoid kernel	0.907489	0.951163	0.980815	0.923251	0.980815	0.0810811
grid, sigmoid kernel synthetic samples	0.535242	0.68175	0.541966	0.918699	0.541966	0.459459
grid, sigmoid kernel upsampled	0.508811	0.656394	0.510791	0.918103	0.510791	0.486486
random forest estimator	0.918502	0.95752	1	0.918502	1	0
random forest estimator synthetic samples	0.848018	0.917365	0.918465	0.916268	0.918465	0.0540541
random forest estimator, upsampled	0.894273	0.944056	0.971223	0.918367	0.971223	0.027027
knn 10	0.918502	0.95752	1	0.918502	1	0
knn 10 synthetic samples	0.632159	0.764457	0.64988	0.928082	0.64988	0.432432
knn 10 upsampled	0.713656	0.826667	0.743405	0.930931	0.743405	0.378378

TABLE XXXII: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.795154	0.884472	0.997199	0.794643	0.997199	0.0515464
Logistic regression synthetic samples	0.612335	0.717949	0.627451	0.838951	0.627451	0.556701
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.792952	0.883663	1	0.791574	1	0.0309278
svm, linear kernel, synthetic samples	0.588106	0.696921	0.602241	0.826923	0.602241	0.536082
svm, linear kernel upsampled samples	0.623348	0.72814	0.641457	0.841912	0.641457	0.556701
svm, poly	0.792952	0.883663	1	0.791574	1	0.0309278
svm, poly synthetic samples	0.588106	0.694943	0.596639	0.832031	0.596639	0.556701
svm, poly upsampled	0.60793	0.718354	0.635854	0.825455	0.635854	0.505155
grid, rbf kernel	0.786344	0.880395	1	0.786344	1	0
grid, rbf kernel synthetic samples	0.618943	0.732612	0.663866	0.817241	0.663866	0.453608
grid, rbf kernel upsampled	0.645374	0.761481	0.719888	0.808176	0.719888	0.371134
grid, sigmoid kernel	0.779736	0.873737	0.969188	0.795402	0.969188	0.0824742
grid, sigmoid kernel synthetic samples	0.539648	0.656814	0.560224	0.793651	0.560224	0.463918
grid, sigmoid kernel upsampled	0.588106	0.696921	0.602241	0.826923	0.602241	0.536082
random forest estimator	0.786344	0.880395	1	0.786344	1	0
random forest estimator synthetic samples	0.693833	0.803949	0.798319	0.809659	0.798319	0.309278
random forest estimator, upsampled	0.720264	0.829071	0.862745	0.797927	0.862745	0.195876
knn 10	0.770925	0.869674	0.971989	0.786848	0.971989	0.0309278
knn 10 synthetic samples	0.592511	0.709576	0.633053	0.807143	0.633053	0.443299
knn 10 upsampled	0.636564	0.74732	0.683473	0.824324	0.683473	0.463918

TABLE XXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.632159	0.758321	0.925795	0.642157	0.925795	0.146199
Logistic regression synthetic samples	0.614537	0.670433	0.628975	0.717742	0.628975	0.590643
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.629956	0.771117	1	0.627494	1	0.0175439
svm, linear kernel, synthetic samples	0.612335	0.666667	0.621908	0.718367	0.621908	0.596491
svm, linear kernel upsampled samples	0.614537	0.677716	0.650177	0.707692	0.650177	0.555556
svm, poly	0.632159	0.771546	0.996466	0.629464	0.996466	0.0292398
svm, poly synthetic samples	0.623348	0.674286	0.625442	0.731405	0.625442	0.619883
svm, poly upsampled	0.634361	0.692593	0.660777	0.727626	0.660777	0.590643
grid, rbf kernel	0.623348	0.76217	0.968198	0.62844	0.968198	0.0526316
grid, rbf kernel synthetic samples	0.605727	0.6629	0.621908	0.709677	0.621908	0.578947
grid, rbf kernel upsampled	0.629956	0.692308	0.667845	0.718631	0.667845	0.567251
grid, sigmoid kernel	0.647577	0.774011	0.968198	0.644706	0.968198	0.116959
grid, sigmoid kernel synthetic samples	0.601322	0.662942	0.628975	0.700787	0.628975	0.555556
grid, sigmoid kernel upsampled	0.623348	0.685083	0.657244	0.715385	0.657244	0.567251
random forest estimator	0.64978	0.763744	0.908127	0.658974	0.908127	0.222222
random forest estimator synthetic samples	0.618943	0.679035	0.646643	0.714844	0.646643	0.573099
random forest estimator, upsampled	0.65859	0.732297	0.749117	0.716216	0.749117	0.508772
knn 10	0.603524	0.728097	0.85159	0.635884	0.85159	0.192982
knn 10 synthetic samples	0.519824	0.558704	0.487633	0.654028	0.487633	0.573099
knn 10 upsampled	0.563877	0.629213	0.59364	0.669323	0.59364	0.51462

TABLE XXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.610132	0.525469	0.513089	0.538462	0.513089	0.680608
Logistic regression synthetic samples	0.585903	0.562791	0.633508	0.506276	0.633508	0.551331
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.605727	0.514905	0.497382	0.533708	0.497382	0.684411
svm, linear kernel, synthetic samples	0.577093	0.571429	0.670157	0.498054	0.670157	0.509506
svm, linear kernel upsampled samples	0.557269	0.569593	0.696335	0.481884	0.696335	0.456274
svm, poly	0.634361	0.551351	0.534031	0.569832	0.534031	0.707224
svm, poly synthetic samples	0.585903	0.572727	0.659686	0.506024	0.659686	0.532319
svm, poly upsampled	0.572687	0.568889	0.670157	0.494208	0.670157	0.501901
grid, rbf kernel	0.610132	0.515068	0.492147	0.54023	0.492147	0.695817
grid, rbf kernel synthetic samples	0.592511	0.570766	0.643979	0.5125	0.643979	0.555133
grid, rbf kernel upsampled	0.57489	0.583153	0.706806	0.496324	0.706806	0.479087
grid, sigmoid kernel	0.599119	0.505435	0.486911	0.525424	0.486911	0.680608
grid, sigmoid kernel synthetic samples	0.561674	0.556793	0.65445	0.484496	0.65445	0.494297
grid, sigmoid kernel upsampled	0.577093	0.573333	0.675393	0.498069	0.675393	0.505703
random forest estimator	0.627753	0.531856	0.502618	0.564706	0.502618	0.718631
random forest estimator synthetic samples	0.618943	0.577017	0.617801	0.541284	0.617801	0.619772
random forest estimator, upsampled	0.579295	0.585683	0.706806	0.5	0.706806	0.486692
knn 10	0.581498	0.515306	0.528796	0.502488	0.528796	0.619772
knn 10 synthetic samples	0.557269	0.531469	0.596859	0.478992	0.596859	0.528517
knn 10 upsampled	0.572687	0.533654	0.581152	0.493333	0.581152	0.56654

TABLE XXXV: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.969892	0.984716	0.997788	0.971983	0.997788	0
Logistic regression synthetic samples	0.677419	0.804688	0.683628	0.977848	0.683628	0.461538
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.972043	0.985823	1	0.972043	1	0
svm, linear kernel, synthetic samples	0.668817	0.7979	0.672566	0.980645	0.672566	0.538462
svm, linear kernel upsampled samples	0.686022	0.811856	0.696903	0.972222	0.696903	0.307692
svm, poly	0.969892	0.984716	0.997788	0.971983	0.997788	0
svm, poly synthetic samples	0.705376	0.823681	0.707965	0.984615	0.707965	0.615385
svm, poly upsampled	0.698925	0.821429	0.712389	0.96988	0.712389	0.230769
grid, rbf kernel	0.972043	0.985823	1	0.972043	1	0
grid, rbf kernel synthetic samples	0.860215	0.924154	0.876106	0.977778	0.876106	0.307692
grid, rbf kernel upsampled	0.888172	0.940367	0.90708	0.97619	0.90708	0.230769
grid, sigmoid kernel	0.972043	0.985792	0.997788	0.974082	0.997788	0.0769231
grid, sigmoid kernel synthetic samples	0.56129	0.714286	0.564159	0.973282	0.564159	0.461538
grid, sigmoid kernel upsampled	0.464516	0.626687	0.462389	0.972093	0.462389	0.538462
random forest estimator	0.972043	0.985823	1	0.972043	1	0
random forest estimator synthetic samples	0.92043	0.958474	0.94469	0.972665	0.94469	0.0769231
random forest estimator, upsampled	0.965591	0.982456	0.99115	0.973913	0.99115	0.0769231
knn 10	0.972043	0.985823	1	0.972043	1	0
knn 10 synthetic samples	0.778495	0.872996	0.783186	0.986072	0.783186	0.615385
knn 10 upsampled	0.898925	0.946408	0.918142	0.976471	0.918142	0.230769

TABLE XXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.935484	0.966592	1	0.935345	1	0.0322581
Logistic regression synthetic samples	0.602151	0.74198	0.612903	0.939929	0.612903	0.451613
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.933333	0.965517	1	0.933333	1	0
svm, linear kernel, synthetic samples	0.572043	0.71612	0.578341	0.940075	0.578341	0.483871
svm, linear kernel upsampled samples	0.632258	0.766074	0.645161	0.942761	0.645161	0.451613
svm, poly	0.933333	0.965517	1	0.933333	1	0
svm, poly synthetic samples	0.591398	0.730878	0.59447	0.948529	0.59447	0.548387
svm, poly upsampled	0.67957	0.80317	0.700461	0.941176	0.700461	0.387097
grid, rbf kernel	0.933333	0.965517	1	0.933333	1	0
grid, rbf kernel synthetic samples	0.662366	0.788124	0.672811	0.95114	0.672811	0.516129
grid, rbf kernel upsampled	0.763441	0.861461	0.788018	0.95	0.788018	0.419355
grid, sigmoid kernel	0.922581	0.959551	0.983871	0.936404	0.983871	0.0645161
grid, sigmoid kernel synthetic samples	0.554839	0.699565	0.5553	0.945098	0.5553	0.548387
grid, sigmoid kernel upsampled	0.541935	0.689051	0.543779	0.940239	0.543779	0.516129
random forest estimator	0.933333	0.965517	1	0.933333	1	0
random forest estimator synthetic samples	0.845161	0.914286	0.884793	0.945813	0.884793	0.290323
random forest estimator, upsampled	0.91828	0.957207	0.979263	0.936123	0.979263	0.0645161
knn 10	0.933333	0.965517	1	0.933333	1	0
knn 10 synthetic samples	0.660215	0.786486	0.670507	0.95098	0.670507	0.516129
knn 10 upsampled	0.703226	0.820312	0.725806	0.943114	0.725806	0.387097

TABLE XXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.795699	0.88568	0.994595	0.798265	0.994595	0.0210526
Logistic regression synthetic samples	0.591398	0.70405	0.610811	0.830882	0.610811	0.515789
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.791398	0.883273	0.991892	0.796095	0.991892	0.0105263
svm, linear kernel, synthetic samples	0.55914	0.667747	0.556757	0.834008	0.556757	0.568421
svm, linear kernel upsampled samples	0.584946	0.694136	0.591892	0.83908	0.591892	0.557895
svm, poly	0.793548	0.884615	0.994595	0.796537	0.994595	0.0105263
svm, poly synthetic samples	0.595699	0.704403	0.605405	0.842105	0.605405	0.557895
svm, poly upsampled	0.625806	0.731481	0.640541	0.852518	0.640541	0.568421
grid, rbf kernel	0.795699	0.886228	1	0.795699	1	0
grid, rbf kernel synthetic samples	0.589247	0.702028	0.608108	0.830258	0.608108	0.515789
grid, rbf kernel upsampled	0.619355	0.729771	0.645946	0.838596	0.645946	0.515789
grid, sigmoid kernel	0.787097	0.88	0.981081	0.797802	0.981081	0.0315789
grid, sigmoid kernel synthetic samples	0.548387	0.66129	0.554054	0.82	0.554054	0.526316
grid, sigmoid kernel upsampled	0.565591	0.667763	0.548649	0.852941	0.548649	0.631579
random forest estimator	0.795699	0.886228	1	0.795699	1	0
random forest estimator synthetic samples	0.668817	0.784916	0.759459	0.812139	0.759459	0.315789
random forest estimator, upsampled	0.733333	0.836842	0.859459	0.815385	0.859459	0.242105
knn 10	0.793548	0.884058	0.989189	0.799127	0.989189	0.0315789
knn 10 synthetic samples	0.537634	0.656	0.554054	0.803922	0.554054	0.473684
knn 10 upsampled	0.606452	0.727273	0.659459	0.810631	0.659459	0.4

TABLE XXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.619355	0.747504	0.89726	0.640587	0.89726	0.150289
Logistic regression synthetic samples	0.608602	0.667883	0.626712	0.714844	0.626712	0.578035
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.630108	0.771883	0.996575	0.62987	0.996575	0.0115607
svm, linear kernel, synthetic samples	0.623656	0.676525	0.626712	0.73494	0.626712	0.618497
svm, linear kernel upsampled samples	0.606452	0.673797	0.64726	0.702602	0.64726	0.537572
svm, poly	0.632258	0.771696	0.989726	0.632385	0.989726	0.0289017
svm, poly synthetic samples	0.617204	0.671587	0.623288	0.728	0.623288	0.606936
svm, poly upsampled	0.612903	0.677419	0.64726	0.710526	0.64726	0.554913
grid, rbf kernel	0.632258	0.765432	0.955479	0.638444	0.955479	0.0867052
grid, rbf kernel synthetic samples	0.612903	0.676259	0.643836	0.712121	0.643836	0.560694
grid, rbf kernel upsampled	0.619355	0.684492	0.657534	0.713755	0.657534	0.554913
grid, sigmoid kernel	0.627957	0.755304	0.914384	0.643373	0.914384	0.144509
grid, sigmoid kernel synthetic samples	0.565591	0.607004	0.534247	0.702703	0.534247	0.618497
grid, sigmoid kernel upsampled	0.526882	0.581749	0.523973	0.653846	0.523973	0.531792
random forest estimator	0.627957	0.75321	0.90411	0.645477	0.90411	0.16185
random forest estimator synthetic samples	0.576344	0.652557	0.633562	0.672727	0.633562	0.479769
random forest estimator, upsampled	0.621505	0.706667	0.726027	0.688312	0.726027	0.445087
knn 10	0.630108	0.736196	0.821918	0.666667	0.821918	0.306358
knn 10 synthetic samples	0.563441	0.611855	0.547945	0.692641	0.547945	0.589595
knn 10 upsampled	0.584946	0.645872	0.60274	0.695652	0.60274	0.554913

TABLE XXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.580645	0.468665	0.411483	0.544304	0.411483	0.71875
Logistic regression synthetic samples	0.552688	0.54185	0.588517	0.502041	0.588517	0.523438
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.569892	0.470899	0.425837	0.526627	0.425837	0.6875
svm, linear kernel, synthetic samples	0.556989	0.544248	0.588517	0.506173	0.588517	0.53125
svm, linear kernel upsampled samples	0.541935	0.541935	0.602871	0.492188	0.602871	0.492188
svm, poly	0.595699	0.491892	0.435407	0.565217	0.435407	0.726562
svm, poly synthetic samples	0.55914	0.539326	0.574163	0.508475	0.574163	0.546875
svm, poly upsampled	0.546237	0.538293	0.588517	0.495968	0.588517	0.511719
grid, rbf kernel	0.610753	0.459701	0.368421	0.611111	0.368421	0.808594
grid, rbf kernel synthetic samples	0.576344	0.538642	0.550239	0.527523	0.550239	0.597656
grid, rbf kernel upsampled	0.539785	0.530702	0.578947	0.489879	0.578947	0.507812
grid, sigmoid kernel	0.55914	0.409222	0.339713	0.514493	0.339713	0.738281
grid, sigmoid kernel synthetic samples	0.546237	0.544276	0.602871	0.496063	0.602871	0.5
grid, sigmoid kernel upsampled	0.572043	0.542529	0.564593	0.522124	0.564593	0.578125
random forest estimator	0.587097	0.454545	0.382775	0.559441	0.382775	0.753906
random forest estimator synthetic samples	0.563441	0.493766	0.473684	0.515625	0.473684	0.636719
random forest estimator, upsampled	0.531183	0.53617	0.602871	0.482759	0.602871	0.472656
knn 10	0.556989	0.452128	0.406699	0.508982	0.406699	0.679688
knn 10 synthetic samples	0.52043	0.492027	0.516746	0.469565	0.516746	0.523438
knn 10 upsampled	0.533333	0.501149	0.521531	0.482301	0.521531	0.542969

TABLE XL: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.974684	0.987179	1	0.974684	1	0
Logistic regression synthetic samples	0.672996	0.80305	0.683983	0.972308	0.683983	0.25
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.974684	0.987179	1	0.974684	1	0
svm, linear kernel, synthetic samples	0.616034	0.758621	0.619048	0.979452	0.619048	0.5
svm, linear kernel upsampled samples	0.630802	0.770642	0.636364	0.976744	0.636364	0.416667
svm, poly	0.974684	0.987179	1	0.974684	1	0
svm, poly synthetic samples	0.64557	0.781818	0.651515	0.977273	0.651515	0.416667
svm, poly upsampled	0.672996	0.801536	0.677489	0.981191	0.677489	0.5
grid, rbf kernel	0.974684	0.987179	1	0.974684	1	0
grid, rbf kernel synthetic samples	0.814346	0.896956	0.829004	0.977041	0.829004	0.25
grid, rbf kernel upsampled	0.869198	0.929545	0.885281	0.978469	0.885281	0.25
grid, sigmoid kernel	0.970464	0.985011	0.995671	0.974576	0.995671	0
grid, sigmoid kernel synthetic samples	0.616034	0.757333	0.614719	0.986111	0.614719	0.666667
grid, sigmoid kernel upsampled	0.550633	0.703755	0.547619	0.984436	0.547619	0.666667
random forest estimator	0.974684	0.987179	1	0.974684	1	0
random forest estimator synthetic samples	0.924051	0.960526	0.948052	0.973333	0.948052	0
random forest estimator, upsampled	0.974684	0.987179	1	0.974684	1	0
knn 10	0.974684	0.987179	1	0.974684	1	0
knn 10 synthetic samples	0.723629	0.838868	0.738095	0.97151	0.738095	0.166667
knn 10 upsampled	0.867089	0.92849	0.885281	0.976134	0.885281	0.166667

TABLE XLI: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.913502	0.954796	0.993119	0.919321	0.993119	0
Logistic regression synthetic samples	0.601266	0.740741	0.619266	0.921502	0.619266	0.394737
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.919831	0.958242	1	0.919831	1	0
svm, linear kernel, synthetic samples	0.618143	0.75307	0.633028	0.929293	0.633028	0.447368
svm, linear kernel upsampled samples	0.64346	0.773154	0.66055	0.932039	0.66055	0.447368
svm, poly	0.915612	0.955947	0.995413	0.919492	0.995413	0
svm, poly synthetic samples	0.64135	0.772118	0.66055	0.929032	0.66055	0.421053
svm, poly upsampled	0.681435	0.803129	0.706422	0.930514	0.706422	0.394737
grid, rbf kernel	0.919831	0.958242	1	0.919831	1	0
grid, rbf kernel synthetic samples	0.632911	0.770449	0.669725	0.906832	0.669725	0.210526
grid, rbf kernel upsampled	0.689873	0.812739	0.731651	0.91404	0.731651	0.210526
grid, sigmoid kernel	0.905063	0.949721	0.974771	0.925926	0.974771	0.105263
grid, sigmoid kernel synthetic samples	0.567511	0.70922	0.573394	0.929368	0.573394	0.5
grid, sigmoid kernel upsampled	0.489451	0.639881	0.493119	0.911017	0.493119	0.447368
random forest estimator	0.919831	0.958242	1	0.919831	1	0
random forest estimator synthetic samples	0.850211	0.918857	0.922018	0.915718	0.922018	0.0263158
random forest estimator, upsampled	0.902954	0.948775	0.977064	0.922078	0.977064	0.0526316
knn 10	0.919831	0.958242	1	0.919831	1	0
knn 10 synthetic samples	0.628692	0.764075	0.65367	0.919355	0.65367	0.342105
knn 10 upsampled	0.708861	0.824427	0.743119	0.925714	0.743119	0.315789

TABLE XLII: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.797468	0.886525	0.989446	0.802998	0.989446	0.0315789
Logistic regression synthetic samples	0.582278	0.685714	0.569921	0.860558	0.569921	0.631579
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.797468	0.887324	0.997361	0.799154	0.997361	0
svm, linear kernel, synthetic samples	0.582278	0.683706	0.564644	0.866397	0.564644	0.652632
svm, linear kernel upsampled samples	0.632911	0.739521	0.651715	0.854671	0.651715	0.557895
svm, poly	0.797468	0.887324	0.997361	0.799154	0.997361	0
svm, poly synthetic samples	0.546414	0.650407	0.527704	0.847458	0.527704	0.621053
svm, poly upsampled	0.632911	0.737952	0.646438	0.859649	0.646438	0.578947
grid, rbf kernel	0.799578	0.888628	1	0.799578	1	0
grid, rbf kernel synthetic samples	0.542194	0.655008	0.543536	0.824	0.543536	0.536842
grid, rbf kernel upsampled	0.605485	0.717095	0.62533	0.840426	0.62533	0.526316
grid, sigmoid kernel	0.793249	0.882494	0.970976	0.808791	0.970976	0.0842105
grid, sigmoid kernel synthetic samples	0.597046	0.704791	0.601583	0.850746	0.601583	0.578947
grid, sigmoid kernel upsampled	0.670886	0.783333	0.744063	0.826979	0.744063	0.378947
random forest estimator	0.799578	0.888628	1	0.799578	1	0
random forest estimator synthetic samples	0.664557	0.783673	0.759894	0.808989	0.759894	0.284211
random forest estimator, upsampled	0.734177	0.840506	0.875989	0.807786	0.875989	0.168421
knn 10	0.78481	0.879147	0.978892	0.797849	0.978892	0.0105263
knn 10 synthetic samples	0.546414	0.664587	0.562005	0.812977	0.562005	0.484211
knn 10 upsampled	0.592827	0.715758	0.641161	0.81	0.641161	0.4

TABLE XLIII: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.630802	0.758621	0.958188	0.627854	0.958188	0.128342
Logistic regression synthetic samples	0.622363	0.666667	0.623693	0.716	0.623693	0.620321
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.603376	0.752632	0.996516	0.604651	0.996516	0
svm, linear kernel, synthetic samples	0.603376	0.656934	0.627178	0.689655	0.627178	0.566845
svm, linear kernel upsampled samples	0.622363	0.688696	0.689895	0.6875	0.689895	0.518717
svm, poly	0.609705	0.754967	0.993031	0.608974	0.993031	0.0213904
svm, poly synthetic samples	0.601266	0.646729	0.602787	0.697581	0.602787	0.59893
svm, poly upsampled	0.626582	0.693241	0.696864	0.689655	0.696864	0.518717
grid, rbf kernel	0.607595	0.75	0.972125	0.610503	0.972125	0.0481283
grid, rbf kernel synthetic samples	0.601266	0.653211	0.620209	0.689922	0.620209	0.572193
grid, rbf kernel upsampled	0.597046	0.674617	0.689895	0.66	0.689895	0.454545
grid, sigmoid kernel	0.632911	0.760331	0.961672	0.628702	0.961672	0.128342
grid, sigmoid kernel synthetic samples	0.603376	0.680272	0.696864	0.664452	0.696864	0.459893
grid, sigmoid kernel upsampled	0.56962	0.663366	0.700348	0.630094	0.700348	0.368984
random forest estimator	0.624473	0.749296	0.926829	0.628842	0.926829	0.160428
random forest estimator synthetic samples	0.603376	0.656934	0.627178	0.689655	0.627178	0.566845
random forest estimator, upsampled	0.605485	0.691928	0.731707	0.65625	0.731707	0.411765
knn 10	0.603376	0.712538	0.811847	0.634877	0.811847	0.283422
knn 10 synthetic samples	0.56962	0.609195	0.554007	0.676596	0.554007	0.593583
knn 10 upsampled	0.575949	0.641711	0.627178	0.656934	0.627178	0.497326

TABLE XLIV: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.588608	0.459834	0.419192	0.509202	0.419192	0.710145
Logistic regression synthetic samples	0.567511	0.541387	0.611111	0.485944	0.611111	0.536232
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.586498	0.458564	0.419192	0.506098	0.419192	0.706522
svm, linear kernel, synthetic samples	0.554852	0.536264	0.616162	0.474708	0.616162	0.51087
svm, linear kernel upsampled samples	0.554852	0.542299	0.631313	0.475285	0.631313	0.5
svm, poly	0.588608	0.465753	0.429293	0.508982	0.429293	0.702899
svm, poly synthetic samples	0.575949	0.552339	0.626263	0.494024	0.626263	0.539855
svm, poly upsampled	0.565401	0.552174	0.641414	0.484733	0.641414	0.51087
grid, rbf kernel	0.597046	0.485175	0.454545	0.520231	0.454545	0.699275
grid, rbf kernel synthetic samples	0.548523	0.518018	0.580808	0.46748	0.580808	0.525362
grid, rbf kernel upsampled	0.552743	0.537118	0.621212	0.473077	0.621212	0.503623
grid, sigmoid kernel	0.565401	0.343949	0.272727	0.465517	0.272727	0.775362
grid, sigmoid kernel synthetic samples	0.546414	0.551148	0.666667	0.469751	0.666667	0.460145
grid, sigmoid kernel upsampled	0.5	0.492505	0.580808	0.427509	0.580808	0.442029
random forest estimator	0.592827	0.450142	0.39899	0.51634	0.39899	0.731884
random forest estimator synthetic samples	0.584388	0.496164	0.489899	0.502591	0.489899	0.652174
random forest estimator, upsampled	0.580169	0.560706	0.641414	0.498039	0.641414	0.536232
knn 10	0.554852	0.457584	0.449495	0.465969	0.449495	0.630435
knn 10 synthetic samples	0.512658	0.471396	0.520202	0.430962	0.520202	0.507246
knn 10 upsampled	0.554852	0.517162	0.570707	0.472803	0.570707	0.543478

TABLE XLV: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.970894	0.985232	0.995736	0.974948	0.995736	0
Logistic regression synthetic samples	0.681913	0.808989	0.690832	0.975904	0.690832	0.333333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.975052	0.987368	1	0.975052	1	0
svm, linear kernel, synthetic samples	0.652807	0.787261	0.658849	0.977848	0.658849	0.416667
svm, linear kernel upsampled samples	0.654886	0.788804	0.660981	0.977918	0.660981	0.416667
svm, poly	0.975052	0.987368	1	0.975052	1	0
svm, poly synthetic samples	0.661123	0.793932	0.66951	0.975155	0.66951	0.333333
svm, poly upsampled	0.627859	0.769032	0.635394	0.973856	0.635394	0.333333
grid, rbf kernel	0.975052	0.987368	1	0.975052	1	0
grid, rbf kernel synthetic samples	0.794179	0.884211	0.80597	0.979275	0.80597	0.333333
grid, rbf kernel upsampled	0.848233	0.917327	0.863539	0.978261	0.863539	0.25
grid, sigmoid kernel	0.966736	0.983087	0.991471	0.974843	0.991471	0
grid, sigmoid kernel synthetic samples	0.619543	0.762029	0.624733	0.976667	0.624733	0.416667
grid, sigmoid kernel upsampled	0.532225	0.687933	0.528785	0.984127	0.528785	0.666667
random forest estimator	0.975052	0.987368	1	0.975052	1	0
random forest estimator synthetic samples	0.943867	0.971123	0.968017	0.974249	0.968017	0
random forest estimator, upsampled	0.975052	0.987368	1	0.975052	1	0
knn 10	0.975052	0.987368	1	0.975052	1	0
knn 10 synthetic samples	0.754678	0.858852	0.765458	0.978202	0.765458	0.333333
knn 10 upsampled	0.873181	0.931996	0.891258	0.976636	0.891258	0.166667

TABLE XLVI: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.923077	0.96	0.997753	0.925	0.997753	0
Logistic regression synthetic samples	0.586279	0.724758	0.588764	0.942446	0.588764	0.555556
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.925156	0.961123	1	0.925156	1	0
svm, linear kernel, synthetic samples	0.590437	0.729767	0.597753	0.93662	0.597753	0.5
svm, linear kernel upsampled samples	0.600832	0.736986	0.604494	0.94386	0.604494	0.555556
svm, poly	0.925156	0.961123	1	0.925156	1	0
svm, poly synthetic samples	0.582121	0.721992	0.586517	0.938849	0.586517	0.527778
svm, poly upsampled	0.700624	0.818182	0.72809	0.933718	0.72809	0.361111
grid, rbf kernel	0.925156	0.961123	1	0.925156	1	0
grid, rbf kernel synthetic samples	0.565489	0.710927	0.577528	0.92446	0.577528	0.416667
grid, rbf kernel upsampled	0.744283	0.84908	0.777528	0.935135	0.777528	0.333333
grid, sigmoid kernel	0.91684	0.956522	0.988764	0.926316	0.988764	0.0277778
grid, sigmoid kernel synthetic samples	0.494802	0.63893	0.483146	0.942982	0.483146	0.638889
grid, sigmoid kernel upsampled	0.503119	0.649046	0.496629	0.936441	0.496629	0.583333
random forest estimator	0.925156	0.961123	1	0.925156	1	0
random forest estimator synthetic samples	0.871102	0.93018	0.92809	0.93228	0.92809	0.166667
random forest estimator, upsampled	0.920998	0.958874	0.995506	0.924843	0.995506	0
knn 10	0.925156	0.961123	1	0.925156	1	0
knn 10 synthetic samples	0.623701	0.758344	0.638202	0.934211	0.638202	0.444444
knn 10 upsampled	0.702703	0.818758	0.725843	0.938953	0.725843	0.416667

TABLE XLVII: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.814969	0.898053	0.982456	0.827004	0.982456	0
Logistic regression synthetic samples	0.571726	0.694362	0.586466	0.850909	0.586466	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.829522	0.906818	1	0.829522	1	0
svm, linear kernel, synthetic samples	0.565489	0.69037	0.58396	0.844203	0.58396	0.47561
svm, linear kernel upsampled samples	0.596674	0.718841	0.621554	0.852234	0.621554	0.47561
svm, poly	0.823285	0.903079	0.992481	0.828452	0.992481	0
svm, poly synthetic samples	0.582121	0.70571	0.60401	0.848592	0.60401	0.47561
svm, poly upsampled	0.586279	0.714491	0.62406	0.83557	0.62406	0.402439
grid, rbf kernel	0.829522	0.906818	1	0.829522	1	0
grid, rbf kernel synthetic samples	0.602911	0.722787	0.62406	0.858621	0.62406	0.5
grid, rbf kernel upsampled	0.644491	0.767347	0.706767	0.839286	0.706767	0.341463
grid, sigmoid kernel	0.821206	0.901602	0.987469	0.829474	0.987469	0.0121951
grid, sigmoid kernel synthetic samples	0.573805	0.693572	0.581454	0.859259	0.581454	0.536585
grid, sigmoid kernel upsampled	0.569647	0.675039	0.538847	0.903361	0.538847	0.719512
random forest estimator	0.829522	0.906818	1	0.829522	1	0
random forest estimator synthetic samples	0.690229	0.803689	0.764411	0.847222	0.764411	0.329268
random forest estimator, upsampled	0.758836	0.859223	0.887218	0.832941	0.887218	0.134146
knn 10	0.814969	0.897583	0.977444	0.829787	0.977444	0.0243902
knn 10 synthetic samples	0.5842	0.702381	0.591479	0.864469	0.591479	0.54878
knn 10 upsampled	0.656965	0.770515	0.694236	0.865625	0.694236	0.47561

TABLE XLVIII: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.634096	0.760218	0.882911	0.667464	0.882911	0.157576
Logistic regression synthetic samples	0.607069	0.680203	0.636076	0.730909	0.636076	0.551515
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.659044	0.79397	1	0.658333	1	0.00606061
svm, linear kernel, synthetic samples	0.592516	0.6609	0.60443	0.729008	0.60443	0.569697
svm, linear kernel upsampled samples	0.602911	0.678992	0.639241	0.724014	0.639241	0.533333
svm, poly	0.654886	0.786082	0.96519	0.663043	0.96519	0.0606061
svm, poly synthetic samples	0.611227	0.678141	0.623418	0.743396	0.623418	0.587879
svm, poly upsampled	0.598753	0.677796	0.642405	0.717314	0.642405	0.515152
grid, rbf kernel	0.669439	0.792699	0.962025	0.674058	0.962025	0.109091
grid, rbf kernel synthetic samples	0.619543	0.698517	0.670886	0.728522	0.670886	0.521212
grid, rbf kernel upsampled	0.5842	0.681529	0.677215	0.685897	0.677215	0.406061
grid, sigmoid kernel	0.64657	0.779793	0.952532	0.660088	0.952532	0.0606061
grid, sigmoid kernel synthetic samples	0.611227	0.680342	0.629747	0.739777	0.629747	0.575758
grid, sigmoid kernel upsampled	0.577963	0.638146	0.566456	0.730612	0.566456	0.6
random forest estimator	0.679834	0.786111	0.89557	0.700495	0.89557	0.266667
random forest estimator synthetic samples	0.64657	0.716667	0.68038	0.757042	0.68038	0.581818
random forest estimator, upsampled	0.640333	0.727559	0.731013	0.724138	0.731013	0.466667
knn 10	0.656965	0.763271	0.841772	0.698163	0.841772	0.30303
knn 10 synthetic samples	0.594595	0.658494	0.594937	0.737255	0.594937	0.593939
knn 10 upsampled	0.596674	0.676667	0.642405	0.714789	0.642405	0.509091

TABLE XLIX: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.567568	0.46114	0.425837	0.502825	0.425837	0.676471
Logistic regression synthetic samples	0.536383	0.52043	0.578947	0.472656	0.578947	0.503676
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.577963	0.493766	0.473684	0.515625	0.473684	0.658088
svm, linear kernel, synthetic samples	0.54262	0.535865	0.607656	0.479245	0.607656	0.492647
svm, linear kernel upsampled samples	0.56341	0.551282	0.617225	0.498069	0.617225	0.522059
svm, poly	0.573805	0.483627	0.45933	0.510638	0.45933	0.661765
svm, poly synthetic samples	0.548857	0.537313	0.602871	0.484615	0.602871	0.507353
svm, poly upsampled	0.555094	0.54661	0.617225	0.490494	0.617225	0.507353
grid, rbf kernel	0.561331	0.418733	0.363636	0.493506	0.363636	0.713235
grid, rbf kernel synthetic samples	0.56341	0.518349	0.54067	0.497797	0.54067	0.580882
grid, rbf kernel upsampled	0.561331	0.542299	0.598086	0.496032	0.598086	0.533088
grid, sigmoid kernel	0.555094	0.405556	0.349282	0.483444	0.349282	0.713235
grid, sigmoid kernel synthetic samples	0.509356	0.491379	0.545455	0.447059	0.545455	0.481618
grid, sigmoid kernel upsampled	0.550936	0.515695	0.550239	0.485232	0.550239	0.551471
random forest estimator	0.573805	0.422535	0.358852	0.513699	0.358852	0.738971
random forest estimator synthetic samples	0.567568	0.482587	0.464115	0.502591	0.464115	0.647059
random forest estimator, upsampled	0.532225	0.541752	0.636364	0.471631	0.636364	0.452206
knn 10	0.569647	0.467866	0.435407	0.505556	0.435407	0.672794
knn 10 synthetic samples	0.54262	0.495413	0.516746	0.475771	0.516746	0.5625
knn 10 upsampled	0.553015	0.503464	0.521531	0.486607	0.521531	0.577206

TABLE L: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.971311	0.985447	1	0.971311	1	0
Logistic regression synthetic samples	0.711066	0.827839	0.71519	0.982609	0.71519	0.571429
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.971311	0.985447	1	0.971311	1	0
svm, linear kernel, synthetic samples	0.629098	0.766452	0.626582	0.986711	0.626582	0.714286
svm, linear kernel upsampled samples	0.639344	0.774359	0.637131	0.986928	0.637131	0.714286
svm, poly	0.971311	0.985447	1	0.971311	1	0
svm, poly synthetic samples	0.639344	0.774359	0.637131	0.986928	0.637131	0.714286
svm, poly upsampled	0.655738	0.787342	0.656118	0.984177	0.656118	0.642857
grid, rbf kernel	0.971311	0.985447	1	0.971311	1	0
grid, rbf kernel synthetic samples	0.82377	0.90205	0.835443	0.980198	0.835443	0.428571
grid, rbf kernel upsampled	0.868852	0.92936	0.888186	0.974537	0.888186	0.214286
grid, sigmoid kernel	0.963115	0.981211	0.991561	0.971074	0.991561	0
grid, sigmoid kernel synthetic samples	0.571721	0.720214	0.567511	0.985348	0.567511	0.714286
grid, sigmoid kernel upsampled	0.571721	0.721704	0.57173	0.978339	0.57173	0.571429
random forest estimator	0.971311	0.985447	1	0.971311	1	0
random forest estimator synthetic samples	0.938525	0.96822	0.964135	0.97234	0.964135	0.0714286
random forest estimator, upsampled	0.971311	0.985447	1	0.971311	1	0
knn 10	0.971311	0.985447	1	0.971311	1	0
knn 10 synthetic samples	0.735656	0.845509	0.744726	0.977839	0.744726	0.428571
knn 10 upsampled	0.862705	0.925967	0.883966	0.972158	0.883966	0.142857

TABLE LI: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.918033	0.957265	1	0.918033	1	0
Logistic regression synthetic samples	0.604508	0.738836	0.609375	0.938144	0.609375	0.55
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.918033	0.957265	1	0.918033	1	0
svm, linear kernel, synthetic samples	0.596311	0.731973	0.600446	0.937282	0.600446	0.55
svm, linear kernel upsampled samples	0.706967	0.821473	0.734375	0.932011	0.734375	0.4
svm, poly	0.918033	0.957265	1	0.918033	1	0
svm, poly synthetic samples	0.616803	0.749665	0.625	0.936455	0.625	0.525
svm, poly upsampled	0.737705	0.845411	0.78125	0.921053	0.78125	0.25
grid, rbf kernel	0.918033	0.957265	1	0.918033	1	0
grid, rbf kernel synthetic samples	0.616803	0.752972	0.636161	0.92233	0.636161	0.4
grid, rbf kernel upsampled	0.735656	0.843636	0.776786	0.923077	0.776786	0.275
grid, sigmoid kernel	0.907787	0.951456	0.984375	0.920668	0.984375	0.05
grid, sigmoid kernel synthetic samples	0.491803	0.638484	0.488839	0.920168	0.488839	0.525
grid, sigmoid kernel upsampled	0.510246	0.659058	0.515625	0.913043	0.515625	0.45
random forest estimator	0.918033	0.957265	1	0.918033	1	0
random forest estimator synthetic samples	0.856557	0.922049	0.924107	0.92	0.924107	0.1
random forest estimator, upsampled	0.907787	0.951456	0.984375	0.920668	0.984375	0.05
knn 10	0.918033	0.957265	1	0.918033	1	0
knn 10 synthetic samples	0.643443	0.770449	0.651786	0.941935	0.651786	0.55
knn 10 upsampled	0.688525	0.808081	0.714286	0.930233	0.714286	0.4

TABLE LII: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.793033	0.883774	0.989691	0.798337	0.989691	0.03
Logistic regression synthetic samples	0.559426	0.664587	0.548969	0.841897	0.548969	0.6
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.795082	0.885845	1	0.795082	1	0
svm, linear kernel, synthetic samples	0.547131	0.653061	0.536082	0.835341	0.536082	0.59
svm, linear kernel upsampled samples	0.592213	0.704309	0.610825	0.831579	0.610825	0.52
svm, poly	0.793033	0.884571	0.997423	0.794661	0.997423	0
svm, poly synthetic samples	0.561475	0.669753	0.559278	0.834615	0.559278	0.57
svm, poly upsampled	0.643443	0.755618	0.693299	0.830247	0.693299	0.45
grid, rbf kernel	0.795082	0.885845	1	0.795082	1	0
grid, rbf kernel synthetic samples	0.616803	0.722963	0.628866	0.850174	0.628866	0.57
grid, rbf kernel upsampled	0.661885	0.771151	0.716495	0.834835	0.716495	0.45
grid, sigmoid kernel	0.766393	0.866197	0.951031	0.795259	0.951031	0.05
grid, sigmoid kernel synthetic samples	0.536885	0.64127	0.520619	0.834711	0.520619	0.6
grid, sigmoid kernel upsampled	0.555328	0.668702	0.564433	0.820225	0.564433	0.52
random forest estimator	0.795082	0.885845	1	0.795082	1	0
random forest estimator synthetic samples	0.709016	0.812665	0.793814	0.832432	0.793814	0.38
random forest estimator, upsampled	0.770492	0.866029	0.93299	0.808036	0.93299	0.14
knn 10	0.788934	0.881745	0.989691	0.795031	0.989691	0.01
knn 10 synthetic samples	0.553279	0.668693	0.56701	0.814815	0.56701	0.5
knn 10 upsampled	0.604508	0.723891	0.652062	0.813505	0.652062	0.42

TABLE LIII: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.631148	0.761905	0.932039	0.644295	0.932039	0.111732
Logistic regression synthetic samples	0.559426	0.612613	0.550162	0.691057	0.550162	0.575419
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.633197	0.774275	0.993528	0.634298	0.993528	0.0111732
svm, linear kernel, synthetic samples	0.563525	0.624339	0.572816	0.686047	0.572816	0.547486
svm, linear kernel upsampled samples	0.586066	0.651724	0.61165	0.697417	0.61165	0.541899
svm, poly	0.641393	0.778761	0.996764	0.639004	0.996764	0.027933
svm, poly synthetic samples	0.584016	0.646957	0.601942	0.699248	0.601942	0.553073
svm, poly upsampled	0.590164	0.655172	0.614887	0.701107	0.614887	0.547486
grid, rbf kernel	0.653689	0.781935	0.980583	0.650215	0.980583	0.0893855
grid, rbf kernel synthetic samples	0.555328	0.610413	0.550162	0.685484	0.550162	0.564246
grid, rbf kernel upsampled	0.606557	0.673469	0.640777	0.709677	0.640777	0.547486
grid, sigmoid kernel	0.612705	0.75033	0.919094	0.633929	0.919094	0.0837989
grid, sigmoid kernel synthetic samples	0.57377	0.631206	0.576052	0.698039	0.576052	0.569832
grid, sigmoid kernel upsampled	0.557377	0.621053	0.572816	0.678161	0.572816	0.530726
random forest estimator	0.653689	0.76881	0.909385	0.665877	0.909385	0.212291
random forest estimator synthetic samples	0.606557	0.673469	0.640777	0.709677	0.640777	0.547486
random forest estimator, upsampled	0.620902	0.713178	0.744337	0.684524	0.744337	0.407821
knn 10	0.590164	0.703264	0.76699	0.649315	0.76699	0.284916
knn 10 synthetic samples	0.52459	0.562264	0.482201	0.674208	0.482201	0.597765
knn 10 upsampled	0.555328	0.621291	0.576052	0.674242	0.576052	0.519553

TABLE LIV: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.579918	0.422535	0.358852	0.513699	0.358852	0.74552
Logistic regression synthetic samples	0.571721	0.538631	0.583732	0.5	0.583732	0.562724
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.57377	0.405714	0.339713	0.503546	0.339713	0.749104
svm, linear kernel, synthetic samples	0.557377	0.555556	0.645933	0.487365	0.645933	0.491039
svm, linear kernel upsampled samples	0.55123	0.520788	0.569378	0.479839	0.569378	0.537634
svm, poly	0.590164	0.393939	0.311005	0.53719	0.311005	0.799283
svm, poly synthetic samples	0.561475	0.561475	0.655502	0.491039	0.655502	0.491039
svm, poly upsampled	0.57377	0.553648	0.617225	0.501946	0.617225	0.541219
grid, rbf kernel	0.594262	0.4	0.315789	0.545455	0.315789	0.802867
grid, rbf kernel synthetic samples	0.536885	0.536885	0.626794	0.469534	0.626794	0.469534
grid, rbf kernel upsampled	0.54918	0.537815	0.61244	0.479401	0.61244	0.501792
grid, sigmoid kernel	0.54918	0.285714	0.210526	0.444444	0.210526	0.802867
grid, sigmoid kernel synthetic samples	0.547131	0.512141	0.555024	0.47541	0.555024	0.541219
grid, sigmoid kernel upsampled	0.559426	0.489311	0.492823	0.485849	0.492823	0.609319
random forest estimator	0.60041	0.450704	0.382775	0.547945	0.382775	0.763441
random forest estimator synthetic samples	0.594262	0.528571	0.5311	0.526066	0.5311	0.641577
random forest estimator, upsampled	0.540984	0.548387	0.650718	0.473868	0.650718	0.458781
knn 10	0.598361	0.473118	0.421053	0.539877	0.421053	0.731183
knn 10 synthetic samples	0.565574	0.513761	0.535885	0.493392	0.535885	0.587814
knn 10 upsampled	0.522541	0.48337	0.521531	0.450413	0.521531	0.523297

TABLE LV: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.967677	0.983573	1	0.967677	1	0
Logistic regression synthetic samples	0.678788	0.804908	0.68476	0.97619	0.68476	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.967677	0.983573	1	0.967677	1	0
svm, linear kernel, synthetic samples	0.606061	0.747736	0.60334	0.982993	0.60334	0.6875
svm, linear kernel upsampled samples	0.640404	0.775253	0.640919	0.980831	0.640919	0.625
svm, poly	0.967677	0.983573	1	0.967677	1	0
svm, poly synthetic samples	0.634343	0.770596	0.634656	0.980645	0.634656	0.625
svm, poly upsampled	0.733333	0.84434	0.74739	0.97019	0.74739	0.3125
grid, rbf kernel	0.967677	0.983573	1	0.967677	1	0
grid, rbf kernel synthetic samples	0.824242	0.902137	0.837161	0.978049	0.837161	0.4375
grid, rbf kernel upsampled	0.868687	0.929117	0.889353	0.972603	0.889353	0.25
grid, sigmoid kernel	0.959596	0.979381	0.991649	0.967413	0.991649	0
grid, sigmoid kernel synthetic samples	0.50101	0.65742	0.494781	0.979339	0.494781	0.6875
grid, sigmoid kernel upsampled	0.50303	0.661157	0.501044	0.97166	0.501044	0.5625
random forest estimator	0.967677	0.983573	1	0.967677	1	0
random forest estimator synthetic samples	0.921212	0.958904	0.949896	0.968085	0.949896	0.0625
random forest estimator, upsampled	0.965657	0.982528	0.997912	0.967611	0.997912	0
knn 10	0.967677	0.983573	1	0.967677	1	0
knn 10 synthetic samples	0.713131	0.830952	0.728601	0.966759	0.728601	0.25
knn 10 upsampled	0.862626	0.926087	0.889353	0.965986	0.889353	0.0625

TABLE LVI: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.909091	0.95228	0.995565	0.912602	0.995565	0.0227273
Logistic regression synthetic samples	0.616162	0.74934	0.629712	0.925081	0.629712	0.477273
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.911111	0.953488	1	0.911111	1	0
svm, linear kernel, synthetic samples	0.610101	0.745046	0.625277	0.921569	0.625277	0.454545
svm, linear kernel upsampled samples	0.648485	0.775773	0.667406	0.926154	0.667406	0.454545
svm, poly	0.911111	0.95339	0.997783	0.912779	0.997783	0.0227273
svm, poly synthetic samples	0.646465	0.773609	0.662971	0.928571	0.662971	0.477273
svm, poly upsampled	0.684848	0.805	0.713969	0.922636	0.713969	0.386364
grid, rbf kernel	0.911111	0.953488	1	0.911111	1	0
grid, rbf kernel synthetic samples	0.705051	0.820197	0.738359	0.922438	0.738359	0.363636
grid, rbf kernel upsampled	0.79798	0.885057	0.853659	0.918854	0.853659	0.227273
grid, sigmoid kernel	0.89899	0.946695	0.984479	0.911704	0.984479	0.0227273
grid, sigmoid kernel synthetic samples	0.50303	0.649573	0.505543	0.908367	0.505543	0.477273
grid, sigmoid kernel upsampled	0.539394	0.680672	0.538803	0.923954	0.538803	0.545455
random forest estimator	0.911111	0.953488	1	0.911111	1	0
random forest estimator synthetic samples	0.878788	0.934354	0.946785	0.922246	0.946785	0.181818
random forest estimator, upsampled	0.89899	0.946581	0.982262	0.913402	0.982262	0.0454545
knn 10	0.909091	0.952381	0.997783	0.910931	0.997783	0
knn 10 synthetic samples	0.591919	0.731383	0.609756	0.913621	0.609756	0.409091
knn 10 upsampled	0.69899	0.815822	0.731707	0.921788	0.731707	0.363636

TABLE LVII: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.789899	0.882086	0.979849	0.802062	0.979849	0.0204082
Logistic regression synthetic samples	0.571717	0.688235	0.589421	0.826855	0.589421	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.80202	0.890135	1	0.80202	1	0
svm, linear kernel, synthetic samples	0.553535	0.670641	0.566751	0.821168	0.566751	0.5
svm, linear kernel upsampled samples	0.640404	0.753463	0.685139	0.836923	0.685139	0.459184
svm, poly	0.806061	0.892135	1	0.805274	1	0.0204082
svm, poly synthetic samples	0.589899	0.701031	0.599496	0.843972	0.599496	0.55102
svm, poly upsampled	0.678788	0.787149	0.740554	0.84	0.740554	0.428571
grid, rbf kernel	0.80202	0.890135	1	0.80202	1	0
grid, rbf kernel synthetic samples	0.626263	0.736091	0.649874	0.848684	0.649874	0.530612
grid, rbf kernel upsampled	0.684848	0.790323	0.740554	0.847262	0.740554	0.459184
grid, sigmoid kernel	0.785859	0.876744	0.949622	0.814255	0.949622	0.122449
grid, sigmoid kernel synthetic samples	0.59596	0.721448	0.652393	0.806854	0.652393	0.367347
grid, sigmoid kernel upsampled	0.614141	0.739427	0.68262	0.806548	0.68262	0.336735
random forest estimator	0.80202	0.890135	1	0.80202	1	0
random forest estimator synthetic samples	0.733333	0.833753	0.833753	0.833753	0.833753	0.326531
random forest estimator, upsampled	0.759596	0.857485	0.901763	0.817352	0.901763	0.183673
knn 10	0.785859	0.879271	0.972292	0.802495	0.972292	0.0306122
knn 10 synthetic samples	0.547475	0.662651	0.554156	0.82397	0.554156	0.520408
knn 10 upsampled	0.573737	0.699858	0.619647	0.803922	0.619647	0.387755

TABLE LVIII: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.610101	0.741633	0.911184	0.625282	0.911184	0.13089
Logistic regression synthetic samples	0.606061	0.652406	0.601974	0.712062	0.601974	0.612565
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.612121	0.758794	0.993421	0.613821	0.993421	0.0052356
svm, linear kernel, synthetic samples	0.577778	0.632689	0.592105	0.679245	0.592105	0.554974
svm, linear kernel upsampled samples	0.593939	0.647986	0.608553	0.692884	0.608553	0.570681
svm, poly	0.610101	0.75662	0.986842	0.613497	0.986842	0.0104712
svm, poly synthetic samples	0.593939	0.642984	0.595395	0.698842	0.595395	0.591623
svm, poly upsampled	0.593939	0.650435	0.615132	0.690037	0.615132	0.560209
grid, rbf kernel	0.614141	0.757306	0.980263	0.616977	0.980263	0.0314136
grid, rbf kernel synthetic samples	0.591919	0.644366	0.601974	0.693182	0.601974	0.575916
grid, rbf kernel upsampled	0.59596	0.657534	0.631579	0.685714	0.631579	0.539267
grid, sigmoid kernel	0.60404	0.742782	0.930921	0.617904	0.930921	0.0837696
grid, sigmoid kernel synthetic samples	0.571717	0.629371	0.592105	0.671642	0.592105	0.539267
grid, sigmoid kernel upsampled	0.561616	0.636516	0.625	0.648464	0.625	0.460733
random forest estimator	0.642424	0.759837	0.921053	0.646651	0.921053	0.198953
random forest estimator synthetic samples	0.614141	0.686371	0.6875	0.685246	0.6875	0.497382
random forest estimator, upsampled	0.628283	0.71517	0.759868	0.675439	0.759868	0.418848
knn 10	0.577778	0.693997	0.779605	0.62533	0.779605	0.256545
knn 10 synthetic samples	0.555556	0.59854	0.539474	0.672131	0.539474	0.581152
knn 10 upsampled	0.563636	0.632653	0.611842	0.65493	0.611842	0.486911

TABLE LIX: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.559596	0.417112	0.369668	0.478528	0.369668	0.700704
Logistic regression synthetic samples	0.573737	0.540305	0.587678	0.5	0.587678	0.56338
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.565657	0.401114	0.341232	0.486486	0.341232	0.732394
svm, linear kernel, synthetic samples	0.565657	0.541578	0.601896	0.492248	0.601896	0.538732
svm, linear kernel upsampled samples	0.539394	0.538462	0.630332	0.469965	0.630332	0.471831
svm, poly	0.581818	0.403458	0.331754	0.514706	0.331754	0.767606
svm, poly synthetic samples	0.569697	0.531868	0.57346	0.495902	0.57346	0.566901
svm, poly upsampled	0.557576	0.536998	0.601896	0.484733	0.601896	0.524648
grid, rbf kernel	0.591919	0.405882	0.327014	0.534884	0.327014	0.788732
grid, rbf kernel synthetic samples	0.567677	0.534783	0.582938	0.493976	0.582938	0.556338
grid, rbf kernel upsampled	0.581818	0.569647	0.649289	0.507407	0.649289	0.53169
grid, sigmoid kernel	0.545455	0.216028	0.146919	0.407895	0.146919	0.841549
grid, sigmoid kernel synthetic samples	0.555556	0.531915	0.592417	0.482625	0.592417	0.528169
grid, sigmoid kernel upsampled	0.539394	0.497797	0.535545	0.465021	0.535545	0.542254
random forest estimator	0.616162	0.478022	0.412322	0.568627	0.412322	0.767606
random forest estimator synthetic samples	0.579798	0.514019	0.521327	0.506912	0.521327	0.623239
random forest estimator, upsampled	0.569697	0.551579	0.620853	0.496212	0.620853	0.53169
knn 10	0.553535	0.454321	0.436019	0.474227	0.436019	0.640845
knn 10 synthetic samples	0.533333	0.492308	0.530806	0.459016	0.530806	0.535211
knn 10 upsampled	0.563636	0.530435	0.578199	0.48996	0.578199	0.552817

TABLE LX: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.963855	0.981595	1	0.963855	1	0
Logistic regression synthetic samples	0.666667	0.797066	0.679167	0.964497	0.679167	0.333333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.961847	0.980553	0.997917	0.963783	0.997917	0
svm, linear kernel, synthetic samples	0.614458	0.756345	0.620833	0.967532	0.620833	0.444444
svm, linear kernel upsampled samples	0.656627	0.789668	0.66875	0.963964	0.66875	0.333333
svm, poly	0.963855	0.981595	1	0.963855	1	0
svm, poly synthetic samples	0.660643	0.791615	0.66875	0.969789	0.66875	0.444444
svm, poly upsampled	0.710843	0.827751	0.720833	0.97191	0.720833	0.444444
grid, rbf kernel	0.963855	0.981595	1	0.963855	1	0
grid, rbf kernel synthetic samples	0.839357	0.912088	0.864583	0.965116	0.864583	0.166667
grid, rbf kernel upsampled	0.889558	0.941427	0.920833	0.962963	0.920833	0.0555556
grid, sigmoid kernel	0.949799	0.974253	0.985417	0.96334	0.985417	0
grid, sigmoid kernel synthetic samples	0.616466	0.756688	0.61875	0.97377	0.61875	0.555556
grid, sigmoid kernel upsampled	0.546185	0.696237	0.539583	0.981061	0.539583	0.722222
random forest estimator	0.963855	0.981595	1	0.963855	1	0
random forest estimator synthetic samples	0.927711	0.9625	0.9625	0.9625	0.9625	0
random forest estimator, upsampled	0.961847	0.980553	0.997917	0.963783	0.997917	0
knn 10	0.963855	0.981595	1	0.963855	1	0
knn 10 synthetic samples	0.696787	0.819594	0.714583	0.960784	0.714583	0.222222
knn 10 upsampled	0.879518	0.935897	0.9125	0.960526	0.9125	0

TABLE LXI: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.907631	0.951579	0.995595	0.91129	0.995595	0
Logistic regression synthetic samples	0.60241	0.740838	0.623348	0.912903	0.623348	0.386364
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.911647	0.953782	1	0.911647	1	0
svm, linear kernel, synthetic samples	0.588353	0.727031	0.601322	0.919192	0.601322	0.454545
svm, linear kernel upsampled samples	0.696787	0.81381	0.726872	0.92437	0.726872	0.386364
svm, poly	0.909639	0.952681	0.997797	0.911469	0.997797	0
svm, poly synthetic samples	0.620482	0.755498	0.643172	0.915361	0.643172	0.386364
svm, poly upsampled	0.730924	0.838554	0.76652	0.925532	0.76652	0.363636
grid, rbf kernel	0.911647	0.953782	1	0.911647	1	0
grid, rbf kernel synthetic samples	0.666667	0.791457	0.693833	0.921053	0.693833	0.386364
grid, rbf kernel upsampled	0.76506	0.862837	0.810573	0.922306	0.810573	0.295455
grid, sigmoid kernel	0.891566	0.942431	0.973568	0.913223	0.973568	0.0454545
grid, sigmoid kernel synthetic samples	0.560241	0.697095	0.555066	0.936803	0.555066	0.613636
grid, sigmoid kernel upsampled	0.52008	0.660028	0.511013	0.931727	0.511013	0.613636
random forest estimator	0.911647	0.953782	1	0.911647	1	0
random forest estimator synthetic samples	0.855422	0.921569	0.931718	0.911638	0.931718	0.0681818
random forest estimator, upsampled	0.901606	0.948148	0.986784	0.912424	0.986784	0.0227273
knn 10	0.911647	0.953782	1	0.911647	1	0
knn 10 synthetic samples	0.614458	0.748691	0.629956	0.922581	0.629956	0.454545
knn 10 upsampled	0.670683	0.795	0.700441	0.919075	0.700441	0.363636

TABLE LXII: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.789157	0.882155	0.994937	0.792339	0.994937	0
Logistic regression synthetic samples	0.616466	0.729844	0.653165	0.826923	0.653165	0.475728
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.793173	0.884658	1	0.793173	1	0
svm, linear kernel, synthetic samples	0.614458	0.728814	0.653165	0.824281	0.653165	0.466019
svm, linear kernel upsampled samples	0.63253	0.751696	0.701266	0.809942	0.701266	0.368932
svm, poly	0.791165	0.883408	0.997468	0.792757	0.997468	0
svm, poly synthetic samples	0.608434	0.719424	0.632911	0.833333	0.632911	0.514563
svm, poly upsampled	0.65261	0.772069	0.741772	0.804945	0.741772	0.31068
grid, rbf kernel	0.793173	0.884658	1	0.793173	1	0
grid, rbf kernel synthetic samples	0.60241	0.71137	0.617722	0.838488	0.617722	0.543689
grid, rbf kernel upsampled	0.656627	0.774704	0.744304	0.807692	0.744304	0.320388
grid, sigmoid kernel	0.773092	0.869666	0.95443	0.798729	0.95443	0.0776699
grid, sigmoid kernel synthetic samples	0.658635	0.77027	0.721519	0.826087	0.721519	0.417476
grid, sigmoid kernel upsampled	0.550201	0.660606	0.551899	0.822642	0.551899	0.543689
random forest estimator	0.793173	0.884658	1	0.793173	1	0
random forest estimator synthetic samples	0.722892	0.8275	0.837975	0.817284	0.837975	0.281553
random forest estimator, upsampled	0.753012	0.851986	0.896203	0.811927	0.896203	0.203883
knn 10	0.779116	0.874429	0.96962	0.796258	0.96962	0.0485437
knn 10 synthetic samples	0.546185	0.662687	0.562025	0.807273	0.562025	0.485437
knn 10 upsampled	0.584337	0.700434	0.612658	0.817568	0.612658	0.475728

TABLE LXIII: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.620482	0.749004	0.936877	0.623894	0.936877	0.137056
Logistic regression synthetic samples	0.614458	0.683168	0.687708	0.678689	0.687708	0.502538
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.604418	0.752823	0.996678	0.604839	0.996678	0.00507614
svm, linear kernel, synthetic samples	0.606426	0.673333	0.671096	0.675585	0.671096	0.507614
svm, linear kernel upsampled samples	0.608434	0.681892	0.694352	0.669872	0.694352	0.477157
svm, poly	0.600402	0.749686	0.990033	0.603239	0.990033	0.00507614
svm, poly synthetic samples	0.606426	0.666667	0.651163	0.682927	0.651163	0.538071
svm, poly upsampled	0.618474	0.689542	0.700997	0.678457	0.700997	0.492386
grid, rbf kernel	0.61245	0.751609	0.9701	0.613445	0.9701	0.0659898
grid, rbf kernel synthetic samples	0.608434	0.657293	0.621262	0.697761	0.621262	0.588832
grid, rbf kernel upsampled	0.604418	0.671119	0.667774	0.674497	0.667774	0.507614
grid, sigmoid kernel	0.60241	0.736	0.916944	0.614699	0.916944	0.121827
grid, sigmoid kernel synthetic samples	0.60241	0.686709	0.72093	0.655589	0.72093	0.42132
grid, sigmoid kernel upsampled	0.570281	0.637288	0.624585	0.650519	0.624585	0.48731
random forest estimator	0.614458	0.744	0.92691	0.621381	0.92691	0.137056
random forest estimator synthetic samples	0.628514	0.704	0.730897	0.679012	0.730897	0.472081
random forest estimator, upsampled	0.608434	0.704097	0.770764	0.648045	0.770764	0.360406
knn 10	0.588353	0.697194	0.784053	0.62766	0.784053	0.28934
knn 10 synthetic samples	0.560241	0.608229	0.564784	0.658915	0.564784	0.553299
knn 10 upsampled	0.558233	0.62585	0.611296	0.641115	0.611296	0.477157

TABLE LXIV: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.574297	0.475248	0.470588	0.48	0.470588	0.646259
Logistic regression synthetic samples	0.546185	0.534979	0.637255	0.460993	0.637255	0.482993
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.562249	0.457711	0.45098	0.464646	0.45098	0.639456
svm, linear kernel, synthetic samples	0.548193	0.547284	0.666667	0.464164	0.666667	0.465986
svm, linear kernel upsampled samples	0.536145	0.517745	0.607843	0.450909	0.607843	0.486395
svm, poly	0.574297	0.430108	0.392157	0.47619	0.392157	0.70068
svm, poly synthetic samples	0.572289	0.560825	0.666667	0.483986	0.666667	0.506803
svm, poly upsampled	0.538153	0.528689	0.632353	0.454225	0.632353	0.472789
grid, rbf kernel	0.596386	0.446281	0.397059	0.509434	0.397059	0.734694
grid, rbf kernel synthetic samples	0.552209	0.507726	0.563725	0.461847	0.563725	0.544218
grid, rbf kernel upsampled	0.538153	0.554264	0.70098	0.458333	0.70098	0.42517
grid, sigmoid kernel	0.552209	0.477752	0.5	0.457399	0.5	0.588435
grid, sigmoid kernel synthetic samples	0.548193	0.520256	0.598039	0.460377	0.598039	0.513605
grid, sigmoid kernel upsampled	0.528112	0.513458	0.607843	0.444444	0.607843	0.472789
random forest estimator	0.594378	0.473958	0.446078	0.505556	0.446078	0.697279
random forest estimator synthetic samples	0.592369	0.537585	0.578431	0.502128	0.578431	0.602041
random forest estimator, upsampled	0.526104	0.55303	0.715686	0.450617	0.715686	0.394558
knn 10	0.588353	0.496314	0.495098	0.497537	0.495098	0.653061
knn 10 synthetic samples	0.590361	0.542601	0.593137	0.5	0.593137	0.588435
knn 10 upsampled	0.528112	0.483516	0.539216	0.438247	0.539216	0.520408

TABLE LXV: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.978088	0.988922	1	0.978088	1	0
Logistic regression synthetic samples	0.611554	0.755332	0.613035	0.98366	0.613035	0.545455
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.978088	0.988922	1	0.978088	1	0
svm, linear kernel, synthetic samples	0.561753	0.713542	0.558045	0.98917	0.558045	0.727273
svm, linear kernel upsampled samples	0.613546	0.755668	0.610998	0.990099	0.610998	0.727273
svm, poly	0.978088	0.988922	1	0.978088	1	0
svm, poly synthetic samples	0.635458	0.773234	0.635438	0.987342	0.635438	0.636364
svm, poly upsampled	0.615538	0.757233	0.613035	0.990132	0.613035	0.727273
grid, rbf kernel	0.978088	0.988922	1	0.978088	1	0
grid, rbf kernel synthetic samples	0.770916	0.869762	0.782077	0.979592	0.782077	0.272727
grid, rbf kernel upsampled	0.894422	0.944034	0.910387	0.980263	0.910387	0.181818
grid, sigmoid kernel	0.974104	0.986882	0.995927	0.978	0.995927	0
grid, sigmoid kernel synthetic samples	0.60757	0.750948	0.604888	0.99	0.604888	0.727273
grid, sigmoid kernel upsampled	0.48008	0.643929	0.480652	0.975207	0.480652	0.454545
random forest estimator	0.978088	0.988922	1	0.978088	1	0
random forest estimator synthetic samples	0.918327	0.957425	0.9389	0.976695	0.9389	0
random forest estimator, upsampled	0.978088	0.988922	1	0.978088	1	0
knn 10	0.978088	0.988922	1	0.978088	1	0
knn 10 synthetic samples	0.713147	0.831382	0.723014	0.977961	0.723014	0.272727
knn 10 upsampled	0.86255	0.926045	0.879837	0.977376	0.879837	0.0909091

TABLE LXVI: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.926295	0.961658	0.997849	0.928	0.997849	0.027027
Logistic regression synthetic samples	0.575697	0.717881	0.582796	0.934483	0.582796	0.486486
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.926295	0.961737	1	0.926295	1	0
svm, linear kernel, synthetic samples	0.5	0.646976	0.494624	0.934959	0.494624	0.567568
svm, linear kernel upsampled samples	0.565737	0.708556	0.569892	0.936396	0.569892	0.513514
svm, poly	0.922311	0.959585	0.995699	0.926	0.995699	0
svm, poly synthetic samples	0.541833	0.685792	0.539785	0.940075	0.539785	0.567568
svm, poly upsampled	0.593625	0.733681	0.604301	0.933555	0.604301	0.459459
grid, rbf kernel	0.926295	0.961737	1	0.926295	1	0
grid, rbf kernel synthetic samples	0.595618	0.736021	0.608602	0.930921	0.608602	0.432432
grid, rbf kernel upsampled	0.667331	0.794081	0.692473	0.930636	0.692473	0.351351
grid, sigmoid kernel	0.926295	0.961498	0.993548	0.931452	0.993548	0.0810811
grid, sigmoid kernel synthetic samples	0.482072	0.628571	0.473118	0.93617	0.473118	0.594595
grid, sigmoid kernel upsampled	0.496016	0.646154	0.496774	0.924	0.496774	0.486486
random forest estimator	0.926295	0.961737	1	0.926295	1	0
random forest estimator synthetic samples	0.870518	0.930183	0.931183	0.929185	0.931183	0.108108
random forest estimator, upsampled	0.928287	0.962733	1	0.928144	1	0.027027
knn 10	0.926295	0.961737	1	0.926295	1	0
knn 10 synthetic samples	0.61753	0.754476	0.634409	0.930599	0.634409	0.405405
knn 10 upsampled	0.643426	0.775408	0.664516	0.930723	0.664516	0.378378

TABLE LXVII: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.814741	0.89769	1	0.814371	1	0.0106383
Logistic regression synthetic samples	0.569721	0.678571	0.558824	0.863636	0.558824	0.617021
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.812749	0.896703	1	0.812749	1	0
svm, linear kernel, synthetic samples	0.553785	0.661631	0.536765	0.862205	0.536765	0.62766
svm, linear kernel upsampled samples	0.547809	0.648062	0.512255	0.881857	0.512255	0.702128
svm, poly	0.814741	0.89769	1	0.814371	1	0.0106383
svm, poly synthetic samples	0.535857	0.639876	0.507353	0.866109	0.507353	0.659574
svm, poly upsampled	0.631474	0.740533	0.647059	0.865574	0.647059	0.56383
grid, rbf kernel	0.812749	0.896703	1	0.812749	1	0
grid, rbf kernel synthetic samples	0.547809	0.665685	0.553922	0.833948	0.553922	0.521277
grid, rbf kernel upsampled	0.631474	0.744828	0.661765	0.851735	0.661765	0.5
grid, sigmoid kernel	0.800797	0.88764	0.968137	0.819502	0.968137	0.0744681
grid, sigmoid kernel synthetic samples	0.559761	0.67356	0.558824	0.847584	0.558824	0.56383
grid, sigmoid kernel upsampled	0.521912	0.628483	0.497549	0.852941	0.497549	0.62766
random forest estimator	0.812749	0.896703	1	0.812749	1	0
random forest estimator synthetic samples	0.697211	0.805627	0.772059	0.842246	0.772059	0.37234
random forest estimator, upsampled	0.784861	0.87234	0.904412	0.842466	0.904412	0.265957
knn 10	0.804781	0.891111	0.982843	0.815041	0.982843	0.0319149
knn 10 synthetic samples	0.567729	0.685962	0.580882	0.837456	0.580882	0.510638
knn 10 upsampled	0.619522	0.730606	0.634804	0.860465	0.634804	0.553191

TABLE LXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.631474	0.76129	0.942492	0.638528	0.942492	0.116402
Logistic regression synthetic samples	0.603586	0.659829	0.616613	0.709559	0.616613	0.582011
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.62749	0.769988	1	0.626	1	0.010582
svm, linear kernel, synthetic samples	0.611554	0.662045	0.610224	0.723485	0.610224	0.613757
svm, linear kernel upsampled samples	0.59761	0.661074	0.629393	0.696113	0.629393	0.544974
svm, poly	0.623506	0.767528	0.996805	0.624	0.996805	0.00529101
svm, poly synthetic samples	0.60757	0.657391	0.603834	0.721374	0.603834	0.613757
svm, poly upsampled	0.61753	0.682119	0.658147	0.707904	0.658147	0.550265
grid, rbf kernel	0.621514	0.765432	0.990415	0.623742	0.990415	0.010582
grid, rbf kernel synthetic samples	0.599602	0.644248	0.58147	0.722222	0.58147	0.62963
grid, rbf kernel upsampled	0.609562	0.689873	0.696486	0.683386	0.696486	0.465608
grid, sigmoid kernel	0.613546	0.7575	0.968051	0.622177	0.968051	0.026455
grid, sigmoid kernel synthetic samples	0.585657	0.648649	0.613419	0.688172	0.613419	0.539683
grid, sigmoid kernel upsampled	0.557769	0.63245	0.610224	0.656357	0.610224	0.470899
random forest estimator	0.635458	0.758256	0.916933	0.646396	0.916933	0.169312
random forest estimator synthetic samples	0.639442	0.711324	0.71246	0.710191	0.71246	0.518519
random forest estimator, upsampled	0.641434	0.735294	0.798722	0.681199	0.798722	0.380952
knn 10	0.615538	0.726241	0.817891	0.653061	0.817891	0.280423
knn 10 synthetic samples	0.593625	0.648276	0.600639	0.70412	0.600639	0.582011
knn 10 upsampled	0.549801	0.623333	0.597444	0.651568	0.597444	0.470899

TABLE LXIX: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.583665	0.383481	0.296804	0.541667	0.296804	0.805654
Logistic regression synthetic samples	0.593625	0.58871	0.666667	0.527076	0.666667	0.537102
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.577689	0.0862069	0.0456621	0.769231	0.0456621	0.989399
svm, linear kernel, synthetic samples	0.571713	0.596623	0.726027	0.506369	0.726027	0.452297
svm, linear kernel upsampled samples	0.547809	0.572505	0.694064	0.487179	0.694064	0.434629
svm, poly	0.577689	0.123967	0.0684932	0.652174	0.0684932	0.971731
svm, poly synthetic samples	0.603586	0.594705	0.666667	0.536765	0.666667	0.55477
svm, poly upsampled	0.563745	0.589118	0.716895	0.5	0.716895	0.44523
grid, rbf kernel	0.581673	0.313725	0.219178	0.551724	0.219178	0.862191
grid, rbf kernel synthetic samples	0.59761	0.555066	0.575342	0.53617	0.575342	0.614841
grid, rbf kernel upsampled	0.573705	0.583658	0.684932	0.508475	0.684932	0.487633
grid, sigmoid kernel	0.561753	0.19708	0.123288	0.490909	0.123288	0.90106
grid, sigmoid kernel synthetic samples	0.517928	0.551852	0.680365	0.464174	0.680365	0.392226
grid, sigmoid kernel upsampled	0.51992	0.552876	0.680365	0.465625	0.680365	0.39576
random forest estimator	0.579681	0.377581	0.292237	0.533333	0.292237	0.80212
random forest estimator synthetic samples	0.595618	0.513189	0.488584	0.540404	0.488584	0.678445
random forest estimator, upsampled	0.545817	0.56654	0.680365	0.485342	0.680365	0.441696
knn 10	0.577689	0.47	0.429224	0.519337	0.429224	0.69258
knn 10 synthetic samples	0.553785	0.527426	0.570776	0.490196	0.570776	0.540636
knn 10 upsampled	0.537849	0.510549	0.552511	0.47451	0.552511	0.526502

TABLE LXX: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.968254	0.983871	1	0.968254	1	0
Logistic regression synthetic samples	0.64881	0.783354	0.655738	0.972644	0.655738	0.4375
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.968254	0.983871	1	0.968254	1	0
svm, linear kernel, synthetic samples	0.579365	0.7289	0.584016	0.969388	0.584016	0.4375
svm, linear kernel upsampled samples	0.607143	0.75063	0.610656	0.973856	0.610656	0.5
svm, poly	0.968254	0.983871	1	0.968254	1	0
svm, poly synthetic samples	0.59127	0.739241	0.598361	0.966887	0.598361	0.375
svm, poly upsampled	0.605159	0.750939	0.614754	0.96463	0.614754	0.3125
grid, rbf kernel	0.968254	0.983871	1	0.968254	1	0
grid, rbf kernel synthetic samples	0.78373	0.878212	0.805328	0.965602	0.805328	0.125
grid, rbf kernel upsampled	0.805556	0.891832	0.827869	0.966507	0.827869	0.125
grid, sigmoid kernel	0.96627	0.982846	0.997951	0.968191	0.997951	0
grid, sigmoid kernel synthetic samples	0.587302	0.733333	0.586066	0.979452	0.586066	0.625
grid, sigmoid kernel upsampled	0.498016	0.659489	0.502049	0.960784	0.502049	0.375
random forest estimator	0.968254	0.983871	1	0.968254	1	0
random forest estimator synthetic samples	0.938492	0.96827	0.969262	0.96728	0.969262	0
random forest estimator, upsampled	0.968254	0.983871	1	0.968254	1	0
knn 10	0.968254	0.983871	1	0.968254	1	0
knn 10 synthetic samples	0.644841	0.781973	0.657787	0.963964	0.657787	0.25
knn 10 upsampled	0.825397	0.904139	0.85041	0.965116	0.85041	0.0625

TABLE LXXI: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.904762	0.95	0.997812	0.906561	0.997812	0
Logistic regression synthetic samples	0.593254	0.730618	0.608315	0.914474	0.608315	0.446809
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.906746	0.951093	1	0.906746	1	0
svm, linear kernel, synthetic samples	0.55754	0.699055	0.56674	0.911972	0.56674	0.468085
svm, linear kernel upsampled samples	0.583333	0.720745	0.592998	0.918644	0.592998	0.489362
svm, poly	0.906746	0.951093	1	0.906746	1	0
svm, poly synthetic samples	0.587302	0.724868	0.599562	0.916388	0.599562	0.468085
svm, poly upsampled	0.623016	0.754522	0.63895	0.921136	0.63895	0.468085
grid, rbf kernel	0.906746	0.951093	1	0.906746	1	0
grid, rbf kernel synthetic samples	0.59127	0.731771	0.61488	0.903537	0.61488	0.361702
grid, rbf kernel upsampled	0.613095	0.749035	0.636761	0.909375	0.636761	0.382979
grid, sigmoid kernel	0.906746	0.950991	0.997812	0.908367	0.997812	0.0212766
grid, sigmoid kernel synthetic samples	0.498016	0.64215	0.496718	0.908	0.496718	0.510638
grid, sigmoid kernel upsampled	0.509921	0.65742	0.5186	0.897727	0.5186	0.425532
random forest estimator	0.906746	0.951093	1	0.906746	1	0
random forest estimator synthetic samples	0.843254	0.914224	0.921225	0.907328	0.921225	0.0851064
random forest estimator, upsampled	0.902778	0.948905	0.995624	0.906375	0.995624	0
knn 10	0.906746	0.951093	1	0.906746	1	0
knn 10 synthetic samples	0.609127	0.750317	0.647702	0.891566	0.647702	0.234043
knn 10 upsampled	0.650794	0.782178	0.691466	0.900285	0.691466	0.255319

TABLE LXXII: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.78373	0.878484	0.997468	0.784861	0.997468	0.00917431
Logistic regression synthetic samples	0.535714	0.638889	0.524051	0.818182	0.524051	0.577982
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.78373	0.878754	1	0.78373	1	0
svm, linear kernel, synthetic samples	0.521825	0.6144	0.486076	0.834783	0.486076	0.651376
svm, linear kernel upsampled samples	0.56746	0.684058	0.597468	0.8	0.597468	0.458716
svm, poly	0.78373	0.878754	1	0.78373	1	0
svm, poly synthetic samples	0.480159	0.563333	0.427848	0.82439	0.427848	0.669725
svm, poly upsampled	0.575397	0.687135	0.594937	0.813149	0.594937	0.504587
grid, rbf kernel	0.78373	0.878754	1	0.78373	1	0
grid, rbf kernel synthetic samples	0.52381	0.620253	0.496203	0.827004	0.496203	0.623853
grid, rbf kernel upsampled	0.599206	0.708934	0.622785	0.822742	0.622785	0.513761
grid, sigmoid kernel	0.771825	0.870349	0.977215	0.784553	0.977215	0.0275229
grid, sigmoid kernel synthetic samples	0.513889	0.634873	0.539241	0.771739	0.539241	0.422018
grid, sigmoid kernel upsampled	0.543651	0.66954	0.589873	0.774086	0.589873	0.376147
random forest estimator	0.78373	0.878754	1	0.78373	1	0
random forest estimator synthetic samples	0.676587	0.790757	0.779747	0.802083	0.779747	0.302752
random forest estimator, upsampled	0.738095	0.84323	0.898734	0.794183	0.898734	0.155963
knn 10	0.78373	0.87794	0.992405	0.787149	0.992405	0.0275229
knn 10 synthetic samples	0.492063	0.594937	0.475949	0.793249	0.475949	0.550459
knn 10 upsampled	0.551587	0.676218	0.597468	0.778878	0.597468	0.385321

TABLE LXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.607143	0.742188	0.92233	0.620915	0.92233	0.107692
Logistic regression synthetic samples	0.559524	0.603571	0.546926	0.673307	0.546926	0.579487
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.609127	0.75709	0.993528	0.611554	0.993528	0
svm, linear kernel, synthetic samples	0.545635	0.588869	0.530744	0.66129	0.530744	0.569231
svm, linear kernel upsampled samples	0.539683	0.582734	0.524272	0.65587	0.524272	0.564103
svm, poly	0.607143	0.755556	0.990291	0.610778	0.990291	0
svm, poly synthetic samples	0.551587	0.586081	0.517799	0.675105	0.517799	0.605128
svm, poly upsampled	0.549603	0.59246	0.533981	0.665323	0.533981	0.574359
grid, rbf kernel	0.619048	0.76	0.983819	0.619145	0.983819	0.0410256
grid, rbf kernel synthetic samples	0.563492	0.615385	0.569579	0.669202	0.569579	0.553846
grid, rbf kernel upsampled	0.569444	0.618629	0.569579	0.676923	0.569579	0.569231
grid, sigmoid kernel	0.611111	0.753149	0.967638	0.616495	0.967638	0.0461538
grid, sigmoid kernel synthetic samples	0.555556	0.630363	0.618123	0.643098	0.618123	0.45641
grid, sigmoid kernel upsampled	0.529762	0.597623	0.569579	0.628571	0.569579	0.466667
random forest estimator	0.611111	0.735135	0.880259	0.63109	0.880259	0.184615
random forest estimator synthetic samples	0.593254	0.657763	0.63754	0.67931	0.63754	0.523077
random forest estimator, upsampled	0.579365	0.671827	0.702265	0.643917	0.702265	0.384615
knn 10	0.559524	0.671598	0.734628	0.618529	0.734628	0.282051
knn 10 synthetic samples	0.501984	0.546112	0.488673	0.618852	0.488673	0.523077
knn 10 upsampled	0.507937	0.569444	0.530744	0.614232	0.530744	0.471795

TABLE LXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.587302	0.405714	0.324201	0.541985	0.324201	0.789474
Logistic regression synthetic samples	0.559524	0.521552	0.552511	0.493878	0.552511	0.564912
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.571429	0.0442478	0.0228311	0.714286	0.0228311	0.992982
svm, linear kernel, synthetic samples	0.551587	0.536885	0.598174	0.486989	0.598174	0.515789
svm, linear kernel upsampled samples	0.577381	0.551579	0.598174	0.511719	0.598174	0.561404
svm, poly	0.581349	0.102128	0.0547945	0.75	0.0547945	0.985965
svm, poly synthetic samples	0.575397	0.554167	0.607306	0.509579	0.607306	0.550877
svm, poly upsampled	0.589286	0.56051	0.60274	0.52381	0.60274	0.578947
grid, rbf kernel	0.581349	0.330159	0.237443	0.541667	0.237443	0.845614
grid, rbf kernel synthetic samples	0.589286	0.554839	0.589041	0.52439	0.589041	0.589474
grid, rbf kernel upsampled	0.59127	0.550218	0.575342	0.527197	0.575342	0.603509
grid, sigmoid kernel	0.571429	0.114754	0.0639269	0.56	0.0639269	0.961404
grid, sigmoid kernel synthetic samples	0.5	0.546763	0.694064	0.451039	0.694064	0.350877
grid, sigmoid kernel upsampled	0.539683	0.534137	0.607306	0.476703	0.607306	0.487719
random forest estimator	0.583333	0.359756	0.269406	0.541284	0.269406	0.824561
random forest estimator synthetic samples	0.555556	0.458937	0.43379	0.487179	0.43379	0.649123
random forest estimator, upsampled	0.551587	0.536885	0.598174	0.486989	0.598174	0.515789
knn 10	0.55754	0.420779	0.369863	0.487952	0.369863	0.701754
knn 10 synthetic samples	0.545635	0.494481	0.511416	0.478632	0.511416	0.57193
knn 10 upsampled	0.553571	0.492099	0.497717	0.486607	0.497717	0.596491

TABLE LXXV: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.972387	0.986	1	0.972387	1	0
Logistic regression synthetic samples	0.668639	0.799523	0.679513	0.971014	0.679513	0.285714
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.972387	0.986	1	0.972387	1	0
svm, linear kernel, synthetic samples	0.627219	0.768666	0.636917	0.969136	0.636917	0.285714
svm, linear kernel upsampled samples	0.66075	0.794258	0.673428	0.96793	0.673428	0.214286
svm, poly	0.972387	0.986	1	0.972387	1	0
svm, poly synthetic samples	0.641026	0.779661	0.653144	0.966967	0.653144	0.214286
svm, poly upsampled	0.74359	0.851598	0.756592	0.97389	0.756592	0.285714
grid, rbf kernel	0.972387	0.986	1	0.972387	1	0
grid, rbf kernel synthetic samples	0.798817	0.887665	0.817444	0.971084	0.817444	0.142857
grid, rbf kernel upsampled	0.86785	0.929101	0.890467	0.971239	0.890467	0.0714286
grid, sigmoid kernel	0.970414	0.984985	0.997972	0.972332	0.997972	0
grid, sigmoid kernel synthetic samples	0.518738	0.675532	0.515213	0.980695	0.515213	0.642857
grid, sigmoid kernel upsampled	0.489152	0.650472	0.488844	0.971774	0.488844	0.5
random forest estimator	0.972387	0.986	1	0.972387	1	0
random forest estimator synthetic samples	0.930966	0.964249	0.957404	0.971193	0.957404	0
random forest estimator, upsampled	0.972387	0.986	1	0.972387	1	0
knn 10	0.972387	0.986	1	0.972387	1	0
knn 10 synthetic samples	0.646943	0.784077	0.659229	0.967262	0.659229	0.214286
knn 10 upsampled	0.824458	0.903575	0.845842	0.969767	0.845842	0.0714286

TABLE LXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.90927	0.952479	0.997835	0.911067	0.997835	0
Logistic regression synthetic samples	0.615385	0.750958	0.636364	0.915888	0.636364	0.4
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.911243	0.95356	1	0.911243	1	0
svm, linear kernel, synthetic samples	0.593688	0.732468	0.61039	0.915584	0.61039	0.422222
svm, linear kernel upsampled samples	0.656805	0.783042	0.679654	0.923529	0.679654	0.422222
svm, poly	0.90927	0.952479	0.997835	0.911067	0.997835	0
svm, poly synthetic samples	0.583826	0.722003	0.593074	0.922559	0.593074	0.488889
svm, poly upsampled	0.635108	0.764331	0.649351	0.928793	0.649351	0.488889
grid, rbf kernel	0.911243	0.95356	1	0.911243	1	0
grid, rbf kernel synthetic samples	0.623274	0.756066	0.640693	0.922118	0.640693	0.444444
grid, rbf kernel upsampled	0.747535	0.8487	0.777056	0.934896	0.777056	0.444444
grid, sigmoid kernel	0.901381	0.948133	0.989177	0.910359	0.989177	0
grid, sigmoid kernel synthetic samples	0.504931	0.643972	0.491342	0.934156	0.491342	0.644444
grid, sigmoid kernel upsampled	0.497041	0.639321	0.489177	0.922449	0.489177	0.577778
random forest estimator	0.911243	0.95356	1	0.911243	1	0
random forest estimator synthetic samples	0.832347	0.907909	0.906926	0.908894	0.906926	0.0666667
random forest estimator, upsampled	0.907298	0.951396	0.995671	0.910891	0.995671	0
knn 10	0.911243	0.95356	1	0.911243	1	0
knn 10 synthetic samples	0.613412	0.749361	0.634199	0.915625	0.634199	0.4
knn 10 upsampled	0.668639	0.793612	0.699134	0.917614	0.699134	0.355556

TABLE LXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.783037	0.878049	0.987531	0.790419	0.987531	0.00943396
Logistic regression synthetic samples	0.579882	0.691751	0.59601	0.824138	0.59601	0.518868
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.790927	0.88326	1	0.790927	1	0
svm, linear kernel, synthetic samples	0.568047	0.679356	0.578554	0.822695	0.578554	0.528302
svm, linear kernel upsampled samples	0.577909	0.69341	0.603491	0.814815	0.603491	0.481132
svm, poly	0.790927	0.88326	1	0.790927	1	0
svm, poly synthetic samples	0.577909	0.685294	0.581047	0.835125	0.581047	0.566038
svm, poly upsampled	0.548323	0.656672	0.546135	0.823308	0.546135	0.556604
grid, rbf kernel	0.790927	0.88326	1	0.790927	1	0
grid, rbf kernel synthetic samples	0.591716	0.69781	0.59601	0.841549	0.59601	0.575472
grid, rbf kernel upsampled	0.577909	0.684366	0.578554	0.837545	0.578554	0.575472
grid, sigmoid kernel	0.775148	0.873051	0.977556	0.788732	0.977556	0.00943396
grid, sigmoid kernel synthetic samples	0.546351	0.671429	0.586035	0.785953	0.586035	0.396226
grid, sigmoid kernel upsampled	0.518738	0.633634	0.526185	0.796226	0.526185	0.490566
random forest estimator	0.790927	0.88326	1	0.790927	1	0
random forest estimator synthetic samples	0.712032	0.814721	0.800499	0.829457	0.800499	0.377358
random forest estimator, upsampled	0.763314	0.858491	0.907731	0.814318	0.907731	0.216981
knn 10	0.779093	0.875831	0.985037	0.788423	0.985037	0
knn 10 synthetic samples	0.56213	0.678261	0.583541	0.809689	0.583541	0.481132
knn 10 upsampled	0.60355	0.718881	0.640898	0.818471	0.640898	0.462264

TABLE LXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.601578	0.734211	0.863777	0.638444	0.863777	0.141304
Logistic regression synthetic samples	0.564103	0.611599	0.5387	0.707317	0.5387	0.608696
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.633136	0.775362	0.993808	0.635644	0.993808	0
svm, linear kernel, synthetic samples	0.564103	0.600362	0.513932	0.721739	0.513932	0.652174
svm, linear kernel upsampled samples	0.544379	0.589698	0.513932	0.691667	0.513932	0.597826
svm, poly	0.629191	0.770732	0.978328	0.635815	0.978328	0.0163043
svm, poly synthetic samples	0.556213	0.608696	0.541796	0.694444	0.541796	0.581522
svm, poly upsampled	0.579882	0.635897	0.575851	0.709924	0.575851	0.586957
grid, rbf kernel	0.625247	0.763682	0.950464	0.638254	0.950464	0.0543478
grid, rbf kernel synthetic samples	0.548323	0.601739	0.535604	0.686508	0.535604	0.570652
grid, rbf kernel upsampled	0.564103	0.628571	0.578947	0.6875	0.578947	0.538043
grid, sigmoid kernel	0.619329	0.761434	0.95356	0.633745	0.95356	0.0326087
grid, sigmoid kernel synthetic samples	0.57002	0.652866	0.634675	0.672131	0.634675	0.456522
grid, sigmoid kernel upsampled	0.540434	0.600343	0.541796	0.673077	0.541796	0.538043
random forest estimator	0.629191	0.752632	0.885449	0.654462	0.885449	0.179348
random forest estimator synthetic samples	0.585799	0.651163	0.606811	0.702509	0.606811	0.548913
random forest estimator, upsampled	0.589744	0.690476	0.718266	0.664756	0.718266	0.36413
knn 10	0.589744	0.698551	0.74613	0.656676	0.74613	0.315217
knn 10 synthetic samples	0.52071	0.571429	0.501548	0.663934	0.501548	0.554348
knn 10 upsampled	0.568047	0.631933	0.582043	0.691176	0.582043	0.543478

TABLE LXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.554241	0.368715	0.285714	0.519685	0.285714	0.778986
Logistic regression synthetic samples	0.544379	0.511628	0.52381	0.5	0.52381	0.561594
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.546351	0.08	0.04329	0.526316	0.04329	0.967391
svm, linear kernel, synthetic samples	0.540434	0.533066	0.575758	0.496269	0.575758	0.51087
svm, linear kernel upsampled samples	0.540434	0.521561	0.549784	0.496094	0.549784	0.532609
svm, poly	0.548323	0.0803213	0.04329	0.555556	0.04329	0.971014
svm, poly synthetic samples	0.57002	0.556911	0.593074	0.524904	0.593074	0.550725
svm, poly upsampled	0.57002	0.543933	0.562771	0.526316	0.562771	0.576087
grid, rbf kernel	0.577909	0.359281	0.25974	0.582524	0.25974	0.844203
grid, rbf kernel synthetic samples	0.556213	0.496644	0.480519	0.513889	0.480519	0.619565
grid, rbf kernel upsampled	0.556213	0.511931	0.510823	0.513043	0.510823	0.594203
grid, sigmoid kernel	0.571992	0.297735	0.199134	0.589744	0.199134	0.884058
grid, sigmoid kernel synthetic samples	0.526627	0.534884	0.597403	0.484211	0.597403	0.467391
grid, sigmoid kernel upsampled	0.558185	0.540984	0.571429	0.513619	0.571429	0.547101
random forest estimator	0.581854	0.380117	0.281385	0.585586	0.281385	0.833333
random forest estimator synthetic samples	0.573964	0.5	0.467532	0.537313	0.467532	0.663043
random forest estimator, upsampled	0.538462	0.535714	0.584416	0.494505	0.584416	0.5
knn 10	0.552268	0.401055	0.329004	0.513514	0.329004	0.73913
knn 10 synthetic samples	0.508876	0.466809	0.471861	0.461864	0.471861	0.539855
knn 10 upsampled	0.536489	0.485777	0.480519	0.49115	0.480519	0.583333

TABLE LXXX: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.97053	0.985045	0.99798	0.972441	0.99798	0
Logistic regression synthetic samples	0.626719	0.766585	0.630303	0.978056	0.630303	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.97053	0.985045	0.99798	0.972441	0.99798	0
svm, linear kernel, synthetic samples	0.536346	0.692708	0.537374	0.974359	0.537374	0.5
svm, linear kernel upsampled samples	0.687623	0.811834	0.692929	0.98	0.692929	0.5
svm, poly	0.97053	0.985045	0.99798	0.972441	0.99798	0
svm, poly synthetic samples	0.552063	0.704663	0.549495	0.981949	0.549495	0.642857
svm, poly upsampled	0.632613	0.771114	0.636364	0.978261	0.636364	0.5
grid, rbf kernel	0.972495	0.986056	1	0.972495	1	0
grid, rbf kernel synthetic samples	0.779961	0.875831	0.79798	0.970516	0.79798	0.142857
grid, rbf kernel upsampled	0.888016	0.940314	0.907071	0.976087	0.907071	0.214286
grid, sigmoid kernel	0.97053	0.985045	0.99798	0.972441	0.99798	0
grid, sigmoid kernel synthetic samples	0.573674	0.724269	0.575758	0.976027	0.575758	0.5
grid, sigmoid kernel upsampled	0.438114	0.601671	0.436364	0.96861	0.436364	0.5
random forest estimator	0.972495	0.986056	1	0.972495	1	0
random forest estimator synthetic samples	0.94499	0.971717	0.971717	0.971717	0.971717	0
random forest estimator, upsampled	0.972495	0.986056	1	0.972495	1	0
knn 10	0.972495	0.986056	1	0.972495	1	0
knn 10 synthetic samples	0.669941	0.8	0.678788	0.973913	0.678788	0.357143
knn 10 upsampled	0.834971	0.909871	0.856566	0.970252	0.856566	0.0714286

TABLE LXXXI: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.907662	0.951596	0.99784	0.909449	0.99784	0
Logistic regression synthetic samples	0.579568	0.713904	0.576674	0.936842	0.576674	0.608696
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.909627	0.952675	1	0.909627	1	0
svm, linear kernel, synthetic samples	0.497053	0.630058	0.470842	0.951965	0.470842	0.76087
svm, linear kernel upsampled samples	0.599214	0.730159	0.596112	0.94198	0.596112	0.630435
svm, poly	0.907662	0.951596	0.99784	0.909449	0.99784	0
svm, poly synthetic samples	0.493124	0.623907	0.462203	0.959641	0.462203	0.804348
svm, poly upsampled	0.624754	0.751625	0.62419	0.944444	0.62419	0.630435
grid, rbf kernel	0.909627	0.952675	1	0.909627	1	0
grid, rbf kernel synthetic samples	0.548134	0.684932	0.539957	0.93633	0.539957	0.630435
grid, rbf kernel upsampled	0.746562	0.847337	0.773218	0.937173	0.773218	0.478261
grid, sigmoid kernel	0.901768	0.948347	0.991361	0.908911	0.991361	0
grid, sigmoid kernel synthetic samples	0.475442	0.614719	0.460043	0.926087	0.460043	0.630435
grid, sigmoid kernel upsampled	0.526523	0.658156	0.50108	0.958678	0.50108	0.782609
random forest estimator	0.909627	0.952675	1	0.909627	1	0
random forest estimator synthetic samples	0.852652	0.919441	0.924406	0.91453	0.924406	0.130435
random forest estimator, upsampled	0.907662	0.951596	0.99784	0.909449	0.99784	0
knn 10	0.909627	0.952675	1	0.909627	1	0
knn 10 synthetic samples	0.595285	0.731771	0.606911	0.921311	0.606911	0.478261
knn 10 upsampled	0.652259	0.782822	0.688985	0.90625	0.688985	0.282609

TABLE LXXXII: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.799607	0.888646	0.985472	0.809145	0.985472	0
Logistic regression synthetic samples	0.552063	0.672414	0.566586	0.826855	0.566586	0.489583
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.811395	0.895879	1	0.811395	1	0
svm, linear kernel, synthetic samples	0.499018	0.608295	0.479419	0.831933	0.479419	0.583333
svm, linear kernel upsampled samples	0.565815	0.679245	0.566586	0.847826	0.566586	0.5625
svm, poly	0.807466	0.893478	0.995157	0.810651	0.995157	0
svm, poly synthetic samples	0.514735	0.618238	0.484262	0.854701	0.484262	0.645833
svm, poly upsampled	0.573674	0.685051	0.571429	0.855072	0.571429	0.583333
grid, rbf kernel	0.811395	0.895879	1	0.811395	1	0
grid, rbf kernel synthetic samples	0.557957	0.672489	0.559322	0.843066	0.559322	0.552083
grid, rbf kernel upsampled	0.59332	0.704708	0.598063	0.857639	0.598063	0.572917
grid, sigmoid kernel	0.770138	0.868981	0.939467	0.808333	0.939467	0.0416667
grid, sigmoid kernel synthetic samples	0.554028	0.67525	0.571429	0.825175	0.571429	0.479167
grid, sigmoid kernel upsampled	0.552063	0.669565	0.559322	0.833935	0.559322	0.520833
random forest estimator	0.811395	0.895879	1	0.811395	1	0
random forest estimator synthetic samples	0.719057	0.8228	0.803874	0.84264	0.803874	0.354167
random forest estimator, upsampled	0.772102	0.866359	0.910412	0.826374	0.910412	0.177083
knn 10	0.807466	0.891832	0.978208	0.819473	0.978208	0.0729167
knn 10 synthetic samples	0.500982	0.61976	0.501211	0.811765	0.501211	0.5
knn 10 upsampled	0.569745	0.691114	0.59322	0.827703	0.59322	0.46875

TABLE LXXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.626719	0.75641	0.907692	0.648352	0.907692	0.130435
Logistic regression synthetic samples	0.565815	0.627319	0.572308	0.69403	0.572308	0.554348
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.636542	0.777911	0.996923	0.637795	0.996923	0
svm, linear kernel, synthetic samples	0.559921	0.607018	0.532308	0.706122	0.532308	0.608696
svm, linear kernel upsampled samples	0.536346	0.601351	0.547692	0.666667	0.547692	0.516304
svm, poly	0.626719	0.770531	0.981538	0.634195	0.981538	0
svm, poly synthetic samples	0.552063	0.588448	0.501538	0.71179	0.501538	0.641304
svm, poly upsampled	0.550098	0.615126	0.563077	0.677778	0.563077	0.527174
grid, rbf kernel	0.634578	0.773723	0.978462	0.639839	0.978462	0.0271739
grid, rbf kernel synthetic samples	0.56778	0.612676	0.535385	0.716049	0.535385	0.625
grid, rbf kernel upsampled	0.587426	0.660194	0.627692	0.696246	0.627692	0.516304
grid, sigmoid kernel	0.636542	0.775758	0.984615	0.64	0.984615	0.0217391
grid, sigmoid kernel synthetic samples	0.552063	0.633441	0.606154	0.6633	0.606154	0.456522
grid, sigmoid kernel upsampled	0.548134	0.625407	0.590769	0.66436	0.590769	0.472826
random forest estimator	0.642436	0.759894	0.886154	0.665127	0.886154	0.211957
random forest estimator synthetic samples	0.603143	0.677316	0.652308	0.704319	0.652308	0.516304
random forest estimator, upsampled	0.614931	0.71345	0.750769	0.679666	0.750769	0.375
knn 10	0.579568	0.688953	0.729231	0.652893	0.729231	0.315217
knn 10 synthetic samples	0.544204	0.585714	0.504615	0.697872	0.504615	0.61413
knn 10 upsampled	0.56778	0.624573	0.563077	0.701149	0.563077	0.576087

TABLE LXXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.573674	0.392157	0.307018	0.542636	0.307018	0.790036
Logistic regression synthetic samples	0.563851	0.562992	0.627193	0.510714	0.627193	0.512456
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.559921	0.216783	0.135965	0.534483	0.135965	0.903915
svm, linear kernel, synthetic samples	0.555992	0.556863	0.622807	0.503546	0.622807	0.501779
svm, linear kernel upsampled samples	0.563851	0.568093	0.640351	0.51049	0.640351	0.501779
svm, poly	0.557957	0.124514	0.0701754	0.551724	0.0701754	0.953737
svm, poly synthetic samples	0.569745	0.559356	0.609649	0.516729	0.609649	0.537367
svm, poly upsampled	0.563851	0.571429	0.649123	0.510345	0.649123	0.494662
grid, rbf kernel	0.575639	0.265306	0.171053	0.590909	0.171053	0.903915
grid, rbf kernel synthetic samples	0.557957	0.545455	0.592105	0.505618	0.592105	0.530249
grid, rbf kernel upsampled	0.557957	0.534161	0.565789	0.505882	0.565789	0.551601
grid, sigmoid kernel	0.554028	0.265372	0.179825	0.506173	0.179825	0.857651
grid, sigmoid kernel synthetic samples	0.561886	0.575238	0.662281	0.508418	0.662281	0.480427
grid, sigmoid kernel upsampled	0.559921	0.560784	0.627193	0.507092	0.627193	0.505338
random forest estimator	0.585462	0.395415	0.302632	0.570248	0.302632	0.814947
random forest estimator synthetic samples	0.56778	0.517544	0.517544	0.517544	0.517544	0.608541
random forest estimator, upsampled	0.532417	0.55597	0.653509	0.483766	0.653509	0.434164
knn 10	0.587426	0.475	0.416667	0.552326	0.416667	0.725979
knn 10 synthetic samples	0.526523	0.513131	0.557018	0.475655	0.557018	0.501779
knn 10 upsampled	0.532417	0.495763	0.513158	0.479508	0.513158	0.548043

TABLE LXXXV: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.962745	0.981019	0.997967	0.964637	0.997967	0
Logistic regression synthetic samples	0.678431	0.804762	0.686992	0.971264	0.686992	0.444444
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.960784	0.98	0.995935	0.964567	0.995935	0
svm, linear kernel, synthetic samples	0.617647	0.757764	0.619919	0.974441	0.619919	0.555556
svm, linear kernel upsampled samples	0.635294	0.773171	0.644309	0.966463	0.644309	0.388889
svm, poly	0.960784	0.98	0.995935	0.964567	0.995935	0
svm, poly synthetic samples	0.629412	0.767528	0.634146	0.971963	0.634146	0.5
svm, poly upsampled	0.682353	0.808057	0.693089	0.96875	0.693089	0.388889
grid, rbf kernel	0.964706	0.982036	1	0.964706	1	0
grid, rbf kernel synthetic samples	0.833333	0.907909	0.851626	0.972158	0.851626	0.333333
grid, rbf kernel upsampled	0.860784	0.924868	0.888211	0.96468	0.888211	0.111111
grid, sigmoid kernel	0.964706	0.982036	1	0.964706	1	0
grid, sigmoid kernel synthetic samples	0.588235	0.732824	0.585366	0.979592	0.585366	0.666667
grid, sigmoid kernel upsampled	0.578431	0.723295	0.571138	0.985965	0.571138	0.777778
random forest estimator	0.964706	0.982036	1	0.964706	1	0
random forest estimator synthetic samples	0.931373	0.964467	0.965447	0.963489	0.965447	0
random forest estimator, upsampled	0.962745	0.981019	0.997967	0.964637	0.997967	0
knn 10	0.964706	0.982036	1	0.964706	1	0
knn 10 synthetic samples	0.7	0.82147	0.715447	0.964384	0.715447	0.277778
knn 10 upsampled	0.878431	0.93501	0.906504	0.965368	0.906504	0.111111

TABLE LXXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.913725	0.954918	0.997859	0.915521	0.997859	0
Logistic regression synthetic samples	0.537255	0.681081	0.539615	0.923077	0.539615	0.511628
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.915686	0.955988	1	0.915686	1	0
svm, linear kernel, synthetic samples	0.501961	0.648199	0.501071	0.917647	0.501071	0.511628
svm, linear kernel upsampled samples	0.629412	0.762861	0.650964	0.921212	0.650964	0.395349
svm, poly	0.911765	0.953846	0.995717	0.915354	0.995717	0
svm, poly synthetic samples	0.507843	0.654746	0.509636	0.915385	0.509636	0.488372
svm, poly upsampled	0.635294	0.769802	0.665953	0.912023	0.665953	0.302326
grid, rbf kernel	0.915686	0.955988	1	0.915686	1	0
grid, rbf kernel synthetic samples	0.586275	0.726329	0.599572	0.921053	0.599572	0.44186
grid, rbf kernel upsampled	0.709804	0.825059	0.747323	0.920844	0.747323	0.302326
grid, sigmoid kernel	0.915686	0.955897	0.997859	0.917323	0.997859	0.0232558
grid, sigmoid kernel synthetic samples	0.554902	0.696929	0.558887	0.925532	0.558887	0.511628
grid, sigmoid kernel upsampled	0.52549	0.6703	0.526767	0.921348	0.526767	0.511628
random forest estimator	0.915686	0.955988	1	0.915686	1	0
random forest estimator synthetic samples	0.858824	0.923567	0.931478	0.915789	0.931478	0.0697674
random forest estimator, upsampled	0.913725	0.954918	0.997859	0.915521	0.997859	0
knn 10	0.915686	0.955988	1	0.915686	1	0
knn 10 synthetic samples	0.531373	0.680054	0.543897	0.907143	0.543897	0.395349
knn 10 upsampled	0.641176	0.772671	0.665953	0.920118	0.665953	0.372093

TABLE LXXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.807843	0.893709	0.997579	0.80943	0.997579	0
Logistic regression synthetic samples	0.531373	0.640602	0.515738	0.845238	0.515738	0.597938
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.809804	0.894908	1	0.809804	1	0
svm, linear kernel, synthetic samples	0.47451	0.567742	0.42615	0.850242	0.42615	0.680412
svm, linear kernel upsampled samples	0.533333	0.625786	0.48184	0.892377	0.48184	0.752577
svm, poly	0.805882	0.892508	0.995157	0.809055	0.995157	0
svm, poly synthetic samples	0.484314	0.580542	0.440678	0.850467	0.440678	0.670103
svm, poly upsampled	0.533333	0.632716	0.496368	0.87234	0.496368	0.690722
grid, rbf kernel	0.809804	0.894908	1	0.809804	1	0
grid, rbf kernel synthetic samples	0.5	0.614221	0.491525	0.818548	0.491525	0.536082
grid, rbf kernel upsampled	0.556863	0.671512	0.559322	0.84	0.559322	0.546392
grid, sigmoid kernel	0.778431	0.875413	0.961259	0.803644	0.961259	0
grid, sigmoid kernel synthetic samples	0.505882	0.608696	0.474576	0.848485	0.474576	0.639175
grid, sigmoid kernel upsampled	0.505882	0.60625	0.469734	0.854626	0.469734	0.659794
random forest estimator	0.809804	0.894908	1	0.809804	1	0
random forest estimator synthetic samples	0.696078	0.806008	0.779661	0.834197	0.779661	0.340206
random forest estimator, upsampled	0.741176	0.848276	0.893462	0.80744	0.893462	0.0927835
knn 10	0.790196	0.882288	0.970944	0.808468	0.970944	0.0206186
knn 10 synthetic samples	0.527451	0.646109	0.532688	0.820896	0.532688	0.505155
knn 10 upsampled	0.57451	0.695652	0.600484	0.826667	0.600484	0.463918

TABLE LXXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.639216	0.765306	0.914634	0.657895	0.914634	0.142857
Logistic regression synthetic samples	0.556863	0.622074	0.567073	0.688889	0.567073	0.538462
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.643137	0.782816	1	0.643137	1	0
svm, linear kernel, synthetic samples	0.560784	0.616438	0.54878	0.703125	0.54878	0.582418
svm, linear kernel upsampled samples	0.554902	0.619765	0.564024	0.687732	0.564024	0.538462
svm, poly	0.643137	0.782816	1	0.643137	1	0
svm, poly synthetic samples	0.556863	0.604895	0.527439	0.709016	0.527439	0.60989
svm, poly upsampled	0.580392	0.646865	0.597561	0.705036	0.597561	0.549451
grid, rbf kernel	0.641176	0.780838	0.993902	0.642998	0.993902	0.00549451
grid, rbf kernel synthetic samples	0.54902	0.596491	0.518293	0.702479	0.518293	0.604396
grid, rbf kernel upsampled	0.594118	0.663415	0.621951	0.710801	0.621951	0.543956
grid, sigmoid kernel	0.617647	0.761322	0.948171	0.635992	0.948171	0.021978
grid, sigmoid kernel synthetic samples	0.541176	0.595156	0.52439	0.688	0.52439	0.571429
grid, sigmoid kernel upsampled	0.584314	0.66875	0.652439	0.685897	0.652439	0.461538
random forest estimator	0.652941	0.772201	0.914634	0.668151	0.914634	0.181319
random forest estimator synthetic samples	0.596078	0.669872	0.637195	0.706081	0.637195	0.521978
random forest estimator, upsampled	0.635294	0.730435	0.768293	0.696133	0.768293	0.395604
knn 10	0.572549	0.68314	0.716463	0.652778	0.716463	0.313187
knn 10 synthetic samples	0.519608	0.566372	0.487805	0.675105	0.487805	0.576923
knn 10 upsampled	0.527451	0.582322	0.512195	0.674699	0.512195	0.554945

TABLE LXXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.568627	0.345238	0.243697	0.591837	0.243697	0.852941
Logistic regression synthetic samples	0.558824	0.554455	0.588235	0.524345	0.588235	0.533088
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.533333	0.0245902	0.012605	0.5	0.012605	0.988971
svm, linear kernel, synthetic samples	0.562745	0.55666	0.588235	0.528302	0.588235	0.540441
svm, linear kernel upsampled samples	0.556863	0.53112	0.537815	0.52459	0.537815	0.573529
svm, poly	0.527451	0.00823045	0.00420168	0.2	0.00420168	0.985294
svm, poly synthetic samples	0.564706	0.541322	0.55042	0.53252	0.55042	0.577206
svm, poly upsampled	0.556863	0.533058	0.542017	0.52439	0.542017	0.569853
grid, rbf kernel	0.576471	0.307692	0.201681	0.648649	0.201681	0.904412
grid, rbf kernel synthetic samples	0.560784	0.502222	0.47479	0.533019	0.47479	0.636029
grid, rbf kernel upsampled	0.562745	0.489703	0.44958	0.537688	0.44958	0.661765
grid, sigmoid kernel	0.533333	0.161972	0.0966387	0.5	0.0966387	0.915441
grid, sigmoid kernel synthetic samples	0.533333	0.567273	0.655462	0.5	0.655462	0.426471
grid, sigmoid kernel upsampled	0.547059	0.56	0.617647	0.512195	0.617647	0.485294
random forest estimator	0.586275	0.381232	0.273109	0.631068	0.273109	0.860294
random forest estimator synthetic samples	0.558824	0.473068	0.42437	0.534392	0.42437	0.676471
random forest estimator, upsampled	0.533333	0.549242	0.609244	0.5	0.609244	0.466912
knn 10	0.57451	0.46683	0.39916	0.56213	0.39916	0.727941
knn 10 synthetic samples	0.55098	0.531697	0.546218	0.517928	0.546218	0.555147
knn 10 upsampled	0.545098	0.536	0.563025	0.51145	0.563025	0.529412

TABLE XC: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.956947	0.978	0.997959	0.958824	0.997959	0
Logistic regression synthetic samples	0.637965	0.77684	0.657143	0.949853	0.657143	0.190476
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.958904	0.979021	1	0.958904	1	0
svm, linear kernel, synthetic samples	0.581213	0.730479	0.591837	0.953947	0.591837	0.333333
svm, linear kernel upsampled samples	0.643836	0.780193	0.659184	0.955621	0.659184	0.285714
svm, poly	0.95499	0.976977	0.995918	0.958743	0.995918	0
svm, poly synthetic samples	0.604697	0.751232	0.622449	0.947205	0.622449	0.190476
svm, poly upsampled	0.639922	0.777778	0.657143	0.952663	0.657143	0.238095
grid, rbf kernel	0.958904	0.979021	1	0.958904	1	0
grid, rbf kernel synthetic samples	0.802348	0.889617	0.830612	0.957647	0.830612	0.142857
grid, rbf kernel upsampled	0.888454	0.940933	0.926531	0.955789	0.926531	0
grid, sigmoid kernel	0.956947	0.978	0.997959	0.958824	0.997959	0
grid, sigmoid kernel synthetic samples	0.53229	0.685112	0.530612	0.966543	0.530612	0.571429
grid, sigmoid kernel upsampled	0.592955	0.737374	0.595918	0.966887	0.595918	0.52381
random forest estimator	0.958904	0.979021	1	0.958904	1	0
random forest estimator synthetic samples	0.927593	0.962437	0.967347	0.957576	0.967347	0
random forest estimator, upsampled	0.956947	0.978	0.997959	0.958824	0.997959	0
knn 10	0.958904	0.979021	1	0.958904	1	0
knn 10 synthetic samples	0.632094	0.77129	0.646939	0.954819	0.646939	0.285714
knn 10 upsampled	0.831703	0.907328	0.859184	0.961187	0.859184	0.190476

TABLE XCI: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.90998	0.952869	0.997854	0.911765	0.997854	0
Logistic regression synthetic samples	0.579256	0.719687	0.592275	0.916944	0.592275	0.444444
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.911937	0.953941	1	0.911937	1	0
svm, linear kernel, synthetic samples	0.500978	0.647303	0.502146	0.910506	0.502146	0.488889
svm, linear kernel upsampled samples	0.600783	0.73913	0.620172	0.914557	0.620172	0.4
svm, poly	0.908023	0.951795	0.995708	0.911591	0.995708	0
svm, poly synthetic samples	0.524462	0.670285	0.530043	0.911439	0.530043	0.466667
svm, poly upsampled	0.592955	0.733333	0.613734	0.910828	0.613734	0.377778
grid, rbf kernel	0.911937	0.953941	1	0.911937	1	0
grid, rbf kernel synthetic samples	0.641879	0.773234	0.669528	0.914956	0.669528	0.355556
grid, rbf kernel upsampled	0.67319	0.795092	0.695279	0.928367	0.695279	0.444444
grid, sigmoid kernel	0.911937	0.953846	0.997854	0.913556	0.997854	0.0222222
grid, sigmoid kernel synthetic samples	0.479452	0.622159	0.469957	0.920168	0.469957	0.577778
grid, sigmoid kernel upsampled	0.553816	0.695187	0.55794	0.921986	0.55794	0.511111
random forest estimator	0.911937	0.953941	1	0.911937	1	0
random forest estimator synthetic samples	0.849315	0.917823	0.922747	0.912951	0.922747	0.0888889
random forest estimator, upsampled	0.908023	0.951795	0.995708	0.911591	0.995708	0
knn 10	0.911937	0.953941	1	0.911937	1	0
knn 10 synthetic samples	0.555773	0.700922	0.570815	0.90785	0.570815	0.4
knn 10 upsampled	0.636008	0.77037	0.669528	0.906977	0.669528	0.288889

TABLE XCII: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.782779	0.877888	0.995012	0.785433	0.995012	0.00909091
Logistic regression synthetic samples	0.526419	0.634441	0.523691	0.804598	0.523691	0.536364
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.784736	0.879386	1	0.784736	1	0
svm, linear kernel, synthetic samples	0.508806	0.608424	0.486284	0.8125	0.486284	0.590909
svm, linear kernel upsampled samples	0.51272	0.605388	0.476309	0.830435	0.476309	0.645455
svm, poly	0.780822	0.876923	0.995012	0.78389	0.995012	0
svm, poly synthetic samples	0.479452	0.568182	0.436409	0.813953	0.436409	0.636364
svm, poly upsampled	0.514677	0.603834	0.471322	0.84	0.471322	0.672727
grid, rbf kernel	0.784736	0.879386	1	0.784736	1	0
grid, rbf kernel synthetic samples	0.516634	0.619414	0.501247	0.810484	0.501247	0.572727
grid, rbf kernel upsampled	0.563601	0.666667	0.55611	0.83209	0.55611	0.590909
grid, sigmoid kernel	0.767123	0.866442	0.962594	0.787755	0.962594	0.0545455
grid, sigmoid kernel synthetic samples	0.502935	0.611621	0.498753	0.790514	0.498753	0.518182
grid, sigmoid kernel upsampled	0.493151	0.599691	0.483791	0.788618	0.483791	0.527273
random forest estimator	0.784736	0.879386	1	0.784736	1	0
random forest estimator synthetic samples	0.671233	0.787879	0.778055	0.797954	0.778055	0.281818
random forest estimator, upsampled	0.755382	0.855825	0.925187	0.796137	0.925187	0.136364
knn 10	0.771037	0.870718	0.982544	0.781746	0.982544	0
knn 10 synthetic samples	0.485323	0.603318	0.498753	0.763359	0.498753	0.436364
knn 10 upsampled	0.567515	0.690042	0.613466	0.788462	0.613466	0.4

TABLE XCIII: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.632094	0.754569	0.905956	0.646532	0.905956	0.177083
Logistic regression synthetic samples	0.540117	0.585538	0.520376	0.669355	0.520376	0.572917
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.624266	0.768116	0.996865	0.624754	0.996865	0.00520833
svm, linear kernel, synthetic samples	0.51272	0.531073	0.442006	0.665094	0.442006	0.630208
svm, linear kernel upsampled samples	0.542074	0.577617	0.501567	0.680851	0.501567	0.609375
svm, poly	0.618395	0.764208	0.990596	0.622047	0.990596	0
svm, poly synthetic samples	0.530333	0.558824	0.476489	0.675556	0.476489	0.619792
svm, poly upsampled	0.55773	0.599291	0.529781	0.689796	0.529781	0.604167
grid, rbf kernel	0.620352	0.765133	0.990596	0.623274	0.990596	0.00520833
grid, rbf kernel synthetic samples	0.518591	0.549451	0.470219	0.660793	0.470219	0.598958
grid, rbf kernel upsampled	0.577299	0.628866	0.573668	0.695817	0.573668	0.583333
grid, sigmoid kernel	0.620352	0.762255	0.974922	0.625755	0.974922	0.03125
grid, sigmoid kernel synthetic samples	0.540117	0.602369	0.557994	0.654412	0.557994	0.510417
grid, sigmoid kernel upsampled	0.53229	0.576991	0.510972	0.662602	0.510972	0.567708
random forest estimator	0.626223	0.751625	0.905956	0.642222	0.905956	0.161458
random forest estimator synthetic samples	0.55773	0.635484	0.617555	0.654485	0.617555	0.458333
random forest estimator, upsampled	0.598826	0.697194	0.739812	0.659218	0.739812	0.364583
knn 10	0.575342	0.692199	0.76489	0.632124	0.76489	0.260417
knn 10 synthetic samples	0.489237	0.521101	0.445141	0.628319	0.445141	0.5625
knn 10 upsampled	0.565558	0.619863	0.567398	0.683019	0.567398	0.5625

TABLE XCIV: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.567515	0.37037	0.296804	0.492424	0.296804	0.770548
Logistic regression synthetic samples	0.553816	0.538462	0.607306	0.483636	0.607306	0.513699
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.561644	0.216783	0.141553	0.462687	0.141553	0.876712
svm, linear kernel, synthetic samples	0.559687	0.545455	0.616438	0.48913	0.616438	0.517123
svm, linear kernel upsampled samples	0.536204	0.507277	0.557078	0.465649	0.557078	0.520548
svm, poly	0.575342	0.162162	0.0958904	0.525	0.0958904	0.934932
svm, poly synthetic samples	0.55773	0.538776	0.60274	0.487085	0.60274	0.523973
svm, poly upsampled	0.53229	0.503119	0.552511	0.461832	0.552511	0.517123
grid, rbf kernel	0.565558	0.26	0.178082	0.481481	0.178082	0.856164
grid, rbf kernel synthetic samples	0.55773	0.508696	0.534247	0.485477	0.534247	0.575342
grid, rbf kernel upsampled	0.530333	0.506173	0.561644	0.460674	0.561644	0.506849
grid, sigmoid kernel	0.579256	0.250871	0.164384	0.529412	0.164384	0.890411
grid, sigmoid kernel synthetic samples	0.547945	0.527607	0.589041	0.477778	0.589041	0.517123
grid, sigmoid kernel upsampled	0.544031	0.55619	0.666667	0.477124	0.666667	0.452055
random forest estimator	0.594912	0.389381	0.30137	0.55	0.30137	0.815068
random forest estimator synthetic samples	0.55773	0.45933	0.438356	0.482412	0.438356	0.64726
random forest estimator, upsampled	0.551859	0.56381	0.675799	0.48366	0.675799	0.458904
knn 10	0.579256	0.452926	0.406393	0.511494	0.406393	0.708904
knn 10 synthetic samples	0.528376	0.477223	0.502283	0.454545	0.502283	0.547945
knn 10 upsampled	0.530333	0.478261	0.502283	0.456432	0.502283	0.55137

TABLE XCV: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.974609	0.987141	0.996008	0.978431	0.996008	0
Logistic regression synthetic samples	0.630859	0.772563	0.640719	0.972727	0.640719	0.181818
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.976562	0.988142	0.998004	0.978474	0.998004	0
svm, linear kernel, synthetic samples	0.570312	0.725	0.578842	0.9699	0.578842	0.181818
svm, linear kernel upsampled samples	0.613281	0.758537	0.620758	0.974922	0.620758	0.272727
svm, poly	0.972656	0.986139	0.994012	0.978389	0.994012	0
svm, poly synthetic samples	0.615234	0.760049	0.622754	0.975	0.622754	0.272727
svm, poly upsampled	0.662109	0.79575	0.672655	0.973988	0.672655	0.181818
grid, rbf kernel	0.978516	0.989141	1	0.978516	1	0
grid, rbf kernel synthetic samples	0.851562	0.919831	0.870259	0.975391	0.870259	0
grid, rbf kernel upsampled	0.896484	0.945417	0.916168	0.976596	0.916168	0
grid, sigmoid kernel	0.976562	0.988142	0.998004	0.978474	0.998004	0
grid, sigmoid kernel synthetic samples	0.572266	0.72522	0.576846	0.976351	0.576846	0.363636
grid, sigmoid kernel upsampled	0.539062	0.695876	0.538922	0.981818	0.538922	0.545455
random forest estimator	0.978516	0.989141	1	0.978516	1	0
random forest estimator synthetic samples	0.951172	0.974975	0.972056	0.977912	0.972056	0
random forest estimator, upsampled	0.978516	0.989141	1	0.978516	1	0
knn 10	0.978516	0.989141	1	0.978516	1	0
knn 10 synthetic samples	0.648438	0.785714	0.658683	0.973451	0.658683	0.181818
knn 10 upsampled	0.839844	0.912766	0.856287	0.977221	0.856287	0.0909091

TABLE XCVI: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.927734	0.962513	0.995807	0.931373	0.995807	0
Logistic regression synthetic samples	0.587891	0.725618	0.584906	0.955479	0.584906	0.628571
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.931641	0.964611	1	0.931641	1	0
svm, linear kernel, synthetic samples	0.517578	0.662107	0.507338	0.952756	0.507338	0.657143
svm, linear kernel upsampled samples	0.730469	0.840278	0.761006	0.937984	0.761006	0.314286
svm, poly	0.927734	0.962513	0.995807	0.931373	0.995807	0
svm, poly synthetic samples	0.496094	0.63764	0.475891	0.965957	0.475891	0.771429
svm, poly upsampled	0.744141	0.849598	0.775681	0.939086	0.775681	0.314286
grid, rbf kernel	0.931641	0.964611	1	0.931641	1	0
grid, rbf kernel synthetic samples	0.5625	0.702918	0.555556	0.956679	0.555556	0.657143
grid, rbf kernel upsampled	0.740234	0.846243	0.767296	0.943299	0.767296	0.371429
grid, sigmoid kernel	0.925781	0.961382	0.991614	0.932939	0.991614	0.0285714
grid, sigmoid kernel synthetic samples	0.507812	0.652893	0.496855	0.951807	0.496855	0.657143
grid, sigmoid kernel upsampled	0.550781	0.693333	0.545073	0.952381	0.545073	0.628571
random forest estimator	0.931641	0.964611	1	0.931641	1	0
random forest estimator synthetic samples	0.875	0.932203	0.922432	0.942184	0.922432	0.228571
random forest estimator, upsampled	0.927734	0.962513	0.995807	0.931373	0.995807	0
knn 10	0.931641	0.964611	1	0.931641	1	0
knn 10 synthetic samples	0.583984	0.72445	0.587002	0.945946	0.587002	0.542857
knn 10 upsampled	0.630859	0.766954	0.651992	0.931138	0.651992	0.342857

TABLE XCVII: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.787109	0.880874	0.982927	0.79802	0.982927	0
Logistic regression synthetic samples	0.5625	0.674419	0.565854	0.834532	0.565854	0.54902
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.800781	0.889371	1	0.800781	1	0
svm, linear kernel, synthetic samples	0.505859	0.606532	0.47561	0.83691	0.47561	0.627451
svm, linear kernel upsampled samples	0.521484	0.629349	0.507317	0.828685	0.507317	0.578431
svm, poly	0.794922	0.885745	0.992683	0.799607	0.992683	0
svm, poly synthetic samples	0.490234	0.586371	0.45122	0.837104	0.45122	0.647059
svm, poly upsampled	0.527344	0.628834	0.5	0.847107	0.5	0.637255
grid, rbf kernel	0.800781	0.889371	1	0.800781	1	0
grid, rbf kernel synthetic samples	0.501953	0.61305	0.492683	0.811245	0.492683	0.539216
grid, rbf kernel upsampled	0.550781	0.673295	0.578049	0.806122	0.578049	0.441176
grid, sigmoid kernel	0.787109	0.880088	0.97561	0.801603	0.97561	0.0294118
grid, sigmoid kernel synthetic samples	0.505859	0.611367	0.485366	0.825726	0.485366	0.588235
grid, sigmoid kernel upsampled	0.490234	0.59409	0.465854	0.819742	0.465854	0.588235
random forest estimator	0.800781	0.889371	1	0.800781	1	0
random forest estimator synthetic samples	0.697266	0.809816	0.804878	0.814815	0.804878	0.264706
random forest estimator, upsampled	0.748047	0.850521	0.895122	0.810155	0.895122	0.156863
knn 10	0.779297	0.875138	0.965854	0.8	0.965854	0.0294118
knn 10 synthetic samples	0.509766	0.624813	0.509756	0.80695	0.509756	0.509804
knn 10 upsampled	0.552734	0.669553	0.565854	0.819788	0.565854	0.5

TABLE XCVIII: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.585938	0.725389	0.880503	0.61674	0.880503	0.103093
Logistic regression synthetic samples	0.550781	0.603448	0.550314	0.667939	0.550314	0.551546
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.621094	0.766265	1	0.621094	1	0
svm, linear kernel, synthetic samples	0.544922	0.577132	0.5	0.682403	0.5	0.618557
svm, linear kernel upsampled samples	0.583984	0.635897	0.584906	0.696629	0.584906	0.582474
svm, poly	0.619141	0.764777	0.996855	0.620352	0.996855	0
svm, poly synthetic samples	0.552734	0.582878	0.503145	0.692641	0.503145	0.634021
svm, poly upsampled	0.597656	0.650847	0.603774	0.705882	0.603774	0.587629
grid, rbf kernel	0.626953	0.769045	1	0.624754	1	0.0154639
grid, rbf kernel synthetic samples	0.544922	0.603066	0.556604	0.657993	0.556604	0.525773
grid, rbf kernel upsampled	0.583984	0.657005	0.641509	0.673267	0.641509	0.489691
grid, sigmoid kernel	0.603516	0.748451	0.949686	0.617587	0.949686	0.0360825
grid, sigmoid kernel synthetic samples	0.576172	0.63773	0.600629	0.679715	0.600629	0.536082
grid, sigmoid kernel upsampled	0.566406	0.626263	0.584906	0.673913	0.584906	0.536082
random forest estimator	0.613281	0.742857	0.899371	0.632743	0.899371	0.14433
random forest estimator synthetic samples	0.580078	0.664587	0.669811	0.659443	0.669811	0.43299
random forest estimator, upsampled	0.589844	0.689349	0.732704	0.650838	0.732704	0.35567
knn 10	0.580078	0.695898	0.773585	0.632391	0.773585	0.262887
knn 10 synthetic samples	0.523438	0.574913	0.518868	0.644531	0.518868	0.530928
knn 10 upsampled	0.529297	0.604269	0.578616	0.632302	0.578616	0.448454

TABLE XCIX: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.568359	0.380952	0.291845	0.548387	0.291845	0.799283
Logistic regression synthetic samples	0.541016	0.529058	0.566524	0.496241	0.566524	0.519713
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.558594	0.0661157	0.0343348	0.888889	0.0343348	0.996416
svm, linear kernel, synthetic samples	0.548828	0.542574	0.587983	0.503676	0.587983	0.516129
svm, linear kernel upsampled samples	0.527344	0.52549	0.575107	0.483755	0.575107	0.487455
svm, poly	0.542969	0.0330579	0.0171674	0.444444	0.0171674	0.982079
svm, poly synthetic samples	0.527344	0.521739	0.566524	0.483516	0.566524	0.494624
svm, poly upsampled	0.523438	0.527132	0.583691	0.480565	0.583691	0.473118
grid, rbf kernel	0.539062	0.276074	0.193133	0.483871	0.193133	0.827957
grid, rbf kernel synthetic samples	0.521484	0.535104	0.60515	0.479592	0.60515	0.451613
grid, rbf kernel upsampled	0.525391	0.529981	0.587983	0.482394	0.587983	0.473118
grid, sigmoid kernel	0.576172	0.297735	0.197425	0.605263	0.197425	0.892473
grid, sigmoid kernel synthetic samples	0.527344	0.56	0.660944	0.485804	0.660944	0.415771
grid, sigmoid kernel upsampled	0.533203	0.573975	0.690987	0.490854	0.690987	0.401434
random forest estimator	0.582031	0.392045	0.296137	0.579832	0.296137	0.820789
random forest estimator synthetic samples	0.523438	0.462555	0.450644	0.475113	0.450644	0.584229
random forest estimator, upsampled	0.521484	0.543762	0.626609	0.480263	0.626609	0.433692
knn 10	0.5625	0.476636	0.437768	0.523077	0.437768	0.666667
knn 10 synthetic samples	0.550781	0.554264	0.613734	0.5053	0.613734	0.498208
knn 10 upsampled	0.533203	0.5286	0.575107	0.489051	0.575107	0.498208

TABLE C: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.964912	0.982143	0.995976	0.968689	0.995976	0
Logistic regression synthetic samples	0.615984	0.758874	0.623742	0.96875	0.623742	0.375
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.964912	0.982143	0.995976	0.968689	0.995976	0
svm, linear kernel, synthetic samples	0.51462	0.671937	0.513078	0.973282	0.513078	0.5625
svm, linear kernel upsampled samples	0.623782	0.764347	0.629779	0.97205	0.629779	0.4375
svm, poly	0.964912	0.982143	0.995976	0.968689	0.995976	0
svm, poly synthetic samples	0.557505	0.711563	0.56338	0.965517	0.56338	0.375
svm, poly upsampled	0.637427	0.775904	0.647887	0.966967	0.647887	0.3125
grid, rbf kernel	0.968811	0.984158	1	0.968811	1	0
grid, rbf kernel synthetic samples	0.777778	0.874725	0.800805	0.96368	0.800805	0.0625
grid, rbf kernel upsampled	0.826511	0.905016	0.853119	0.963636	0.853119	0
grid, sigmoid kernel	0.966862	0.983152	0.997988	0.96875	0.997988	0
grid, sigmoid kernel synthetic samples	0.510721	0.666667	0.50503	0.980469	0.50503	0.6875
grid, sigmoid kernel upsampled	0.504873	0.661333	0.498994	0.980237	0.498994	0.6875
random forest estimator	0.968811	0.984158	1	0.968811	1	0
random forest estimator synthetic samples	0.949318	0.974	0.979879	0.968191	0.979879	0
random forest estimator, upsampled	0.968811	0.984158	1	0.968811	1	0
knn 10	0.968811	0.984158	1	0.968811	1	0
knn 10 synthetic samples	0.596491	0.744129	0.605634	0.964744	0.605634	0.3125
knn 10 upsampled	0.820663	0.901288	0.84507	0.965517	0.84507	0.0625

TABLE CI: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.910331	0.953061	0.993617	0.915686	0.993617	0
Logistic regression synthetic samples	0.569201	0.710354	0.576596	0.924915	0.576596	0.488372
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.916179	0.956256	1	0.916179	1	0
svm, linear kernel, synthetic samples	0.54191	0.682003	0.53617	0.936803	0.53617	0.604651
svm, linear kernel upsampled samples	0.653021	0.780788	0.674468	0.926901	0.674468	0.418605
svm, poly	0.910331	0.953061	0.993617	0.915686	0.993617	0
svm, poly synthetic samples	0.559454	0.697861	0.555319	0.938849	0.555319	0.604651
svm, poly upsampled	0.725146	0.833922	0.753191	0.934037	0.753191	0.418605
grid, rbf kernel	0.916179	0.956256	1	0.916179	1	0
grid, rbf kernel synthetic samples	0.569201	0.711864	0.580851	0.919192	0.580851	0.44186
grid, rbf kernel upsampled	0.74269	0.847222	0.778723	0.928934	0.778723	0.348837
grid, sigmoid kernel	0.912281	0.954035	0.993617	0.917485	0.993617	0.0232558
grid, sigmoid kernel synthetic samples	0.45614	0.597403	0.440426	0.928251	0.440426	0.627907
grid, sigmoid kernel upsampled	0.510721	0.654746	0.506383	0.92607	0.506383	0.55814
random forest estimator	0.916179	0.956256	1	0.916179	1	0
random forest estimator synthetic samples	0.844055	0.914347	0.908511	0.920259	0.908511	0.139535
random forest estimator, upsampled	0.900585	0.947692	0.982979	0.914851	0.982979	0
knn 10	0.916179	0.956256	1	0.916179	1	0
knn 10 synthetic samples	0.54386	0.691293	0.557447	0.909722	0.557447	0.395349
knn 10 upsampled	0.615984	0.756489	0.651064	0.902655	0.651064	0.232558

TABLE CII: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.779727	0.875688	0.992519	0.783465	0.992519	0.0178571
Logistic regression synthetic samples	0.565302	0.678211	0.586035	0.804795	0.586035	0.491071
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.781676	0.877462	1	0.781676	1	0
svm, linear kernel, synthetic samples	0.54191	0.650817	0.546135	0.805147	0.546135	0.526786
svm, linear kernel upsampled samples	0.586745	0.695402	0.603491	0.820339	0.603491	0.526786
svm, poly	0.777778	0.875	0.995012	0.780822	0.995012	0
svm, poly synthetic samples	0.499025	0.597809	0.476309	0.802521	0.476309	0.580357
svm, poly upsampled	0.578947	0.687861	0.593516	0.817869	0.593516	0.526786
grid, rbf kernel	0.781676	0.877462	1	0.781676	1	0
grid, rbf kernel synthetic samples	0.555556	0.657658	0.546135	0.826415	0.546135	0.589286
grid, rbf kernel upsampled	0.623782	0.734525	0.665835	0.819018	0.665835	0.473214
grid, sigmoid kernel	0.768031	0.867631	0.972569	0.783133	0.972569	0.0357143
grid, sigmoid kernel synthetic samples	0.473684	0.555921	0.421446	0.816425	0.421446	0.660714
grid, sigmoid kernel upsampled	0.524366	0.61875	0.493766	0.828452	0.493766	0.633929
random forest estimator	0.781676	0.877462	1	0.781676	1	0
random forest estimator synthetic samples	0.701754	0.809465	0.810474	0.808458	0.810474	0.3125
random forest estimator, upsampled	0.730994	0.838028	0.890274	0.791574	0.890274	0.160714
knn 10	0.768031	0.867336	0.970075	0.784274	0.970075	0.0446429
knn 10 synthetic samples	0.508772	0.618182	0.508728	0.787645	0.508728	0.508929
knn 10 upsampled	0.538012	0.658993	0.571072	0.778912	0.571072	0.419643

TABLE CIII: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.60039	0.738854	0.926518	0.614407	0.926518	0.09
Logistic regression synthetic samples	0.610136	0.673203	0.658147	0.688963	0.658147	0.535
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.608187	0.756364	0.996805	0.609375	0.996805	0
svm, linear kernel, synthetic samples	0.594542	0.648649	0.613419	0.688172	0.613419	0.565
svm, linear kernel upsampled samples	0.563353	0.629139	0.607029	0.652921	0.607029	0.495
svm, poly	0.606238	0.754854	0.99361	0.608611	0.99361	0
svm, poly synthetic samples	0.584795	0.643216	0.613419	0.676056	0.613419	0.54
svm, poly upsampled	0.567251	0.63	0.603834	0.658537	0.603834	0.51
grid, rbf kernel	0.610136	0.756691	0.99361	0.611002	0.99361	0.01
grid, rbf kernel synthetic samples	0.590643	0.642857	0.603834	0.687273	0.603834	0.57
grid, rbf kernel upsampled	0.610136	0.675325	0.664537	0.686469	0.664537	0.525
grid, sigmoid kernel	0.602339	0.75	0.977636	0.60835	0.977636	0.015
grid, sigmoid kernel synthetic samples	0.596491	0.67907	0.699681	0.659639	0.699681	0.435
grid, sigmoid kernel upsampled	0.580897	0.66563	0.683706	0.648485	0.683706	0.42
random forest estimator	0.62768	0.756066	0.945687	0.629787	0.945687	0.13
random forest estimator synthetic samples	0.631579	0.704225	0.71885	0.690184	0.71885	0.495
random forest estimator, upsampled	0.649123	0.73913	0.814696	0.676393	0.814696	0.39
knn 10	0.631579	0.734177	0.833866	0.655779	0.833866	0.315
knn 10 synthetic samples	0.563353	0.595668	0.527157	0.684647	0.527157	0.62
knn 10 upsampled	0.573099	0.642741	0.629393	0.656667	0.629393	0.485

TABLE CIV: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.578947	0.406593	0.327434	0.536232	0.327434	0.777003
Logistic regression synthetic samples	0.545809	0.559546	0.654867	0.488449	0.654867	0.45993
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.565302	0.0429185	0.0221239	0.714286	0.0221239	0.993031
svm, linear kernel, synthetic samples	0.532164	0.557196	0.668142	0.477848	0.668142	0.425087
svm, linear kernel upsampled samples	0.557505	0.552268	0.619469	0.498221	0.619469	0.508711
svm, poly	0.559454	0.0173913	0.00884956	0.5	0.00884956	0.993031
svm, poly synthetic samples	0.536062	0.554307	0.654867	0.480519	0.654867	0.442509
svm, poly upsampled	0.54386	0.541176	0.610619	0.485915	0.610619	0.491289
grid, rbf kernel	0.557505	0.255738	0.172566	0.493671	0.172566	0.860627
grid, rbf kernel synthetic samples	0.551657	0.524793	0.561947	0.492248	0.561947	0.543554
grid, rbf kernel upsampled	0.569201	0.53277	0.557522	0.510121	0.557522	0.578397
grid, sigmoid kernel	0.567251	0.27451	0.185841	0.525	0.185841	0.867596
grid, sigmoid kernel synthetic samples	0.510721	0.555752	0.69469	0.463127	0.69469	0.365854
grid, sigmoid kernel upsampled	0.532164	0.53125	0.60177	0.475524	0.60177	0.477352
random forest estimator	0.580897	0.394366	0.309735	0.542636	0.309735	0.794425
random forest estimator synthetic samples	0.569201	0.522678	0.535398	0.510549	0.535398	0.595819
random forest estimator, upsampled	0.54386	0.568266	0.681416	0.487342	0.681416	0.43554
knn 10	0.549708	0.432432	0.389381	0.486188	0.389381	0.675958
knn 10 synthetic samples	0.539961	0.512397	0.548673	0.48062	0.548673	0.533101
knn 10 upsampled	0.532164	0.510204	0.553097	0.473485	0.553097	0.515679

TABLE CV: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.963107	0.981207	1	0.963107	1	0
Logistic regression synthetic samples	0.660194	0.792899	0.675403	0.959885	0.675403	0.263158
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.963107	0.981207	1	0.963107	1	0
svm, linear kernel, synthetic samples	0.586408	0.734745	0.594758	0.960912	0.594758	0.368421
svm, linear kernel upsampled samples	0.578641	0.729763	0.590726	0.954397	0.590726	0.263158
svm, poly	0.963107	0.981207	1	0.963107	1	0
svm, poly synthetic samples	0.666019	0.79717	0.681452	0.960227	0.681452	0.263158
svm, poly upsampled	0.730097	0.842225	0.747984	0.963636	0.747984	0.263158
grid, rbf kernel	0.963107	0.981207	1	0.963107	1	0
grid, rbf kernel synthetic samples	0.825243	0.904051	0.854839	0.959276	0.854839	0.0526316
grid, rbf kernel upsampled	0.867961	0.929019	0.897177	0.963203	0.897177	0.105263
grid, sigmoid kernel	0.953398	0.976096	0.987903	0.964567	0.987903	0.0526316
grid, sigmoid kernel synthetic samples	0.537864	0.690104	0.534274	0.974265	0.534274	0.631579
grid, sigmoid kernel upsampled	0.514563	0.670185	0.512097	0.969466	0.512097	0.578947
random forest estimator	0.963107	0.981207	1	0.963107	1	0
random forest estimator synthetic samples	0.904854	0.950051	0.939516	0.960825	0.939516	0
random forest estimator, upsampled	0.95534	0.97716	0.991935	0.962818	0.991935	0
knn 10	0.963107	0.981207	1	0.963107	1	0
knn 10 synthetic samples	0.642718	0.779376	0.655242	0.961538	0.655242	0.315789
knn 10 upsampled	0.836893	0.910828	0.864919	0.961883	0.864919	0.105263

TABLE CVI: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.91068	0.953157	0.993631	0.915851	0.993631	0.0227273
Logistic regression synthetic samples	0.553398	0.69496	0.556263	0.925795	0.556263	0.522727
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.914563	0.955375	1	0.914563	1	0
svm, linear kernel, synthetic samples	0.497087	0.64177	0.492569	0.920635	0.492569	0.545455
svm, linear kernel upsampled samples	0.541748	0.685333	0.545648	0.921147	0.545648	0.5
svm, poly	0.914563	0.955375	1	0.914563	1	0
svm, poly synthetic samples	0.500971	0.645517	0.496815	0.92126	0.496815	0.545455
svm, poly upsampled	0.609709	0.745891	0.626327	0.921875	0.626327	0.431818
grid, rbf kernel	0.914563	0.955375	1	0.914563	1	0
grid, rbf kernel synthetic samples	0.598058	0.734955	0.609342	0.925806	0.609342	0.477273
grid, rbf kernel upsampled	0.681553	0.804762	0.717622	0.915989	0.717622	0.295455
grid, sigmoid kernel	0.908738	0.951795	0.985138	0.920635	0.985138	0.0909091
grid, sigmoid kernel synthetic samples	0.483495	0.627451	0.475584	0.921811	0.475584	0.568182
grid, sigmoid kernel upsampled	0.502913	0.647383	0.498938	0.921569	0.498938	0.545455
random forest estimator	0.914563	0.955375	1	0.914563	1	0
random forest estimator synthetic samples	0.831068	0.906552	0.895966	0.917391	0.895966	0.136364
random forest estimator, upsampled	0.904854	0.950051	0.989384	0.913725	0.989384	0
knn 10	0.912621	0.954315	0.997877	0.914397	0.997877	0
knn 10 synthetic samples	0.584466	0.725641	0.600849	0.915858	0.600849	0.409091
knn 10 upsampled	0.638835	0.772616	0.670913	0.910663	0.670913	0.295455

TABLE CVII: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.803883	0.890811	0.98801	0.811024	0.98801	0.0204082
Logistic regression synthetic samples	0.545631	0.664756	0.556355	0.825623	0.556355	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.809709	0.89485	1	0.809709	1	0
svm, linear kernel, synthetic samples	0.55534	0.672389	0.563549	0.833333	0.563549	0.520408
svm, linear kernel upsampled samples	0.61165	0.728261	0.642686	0.840125	0.642686	0.479592
svm, poly	0.809709	0.89485	1	0.809709	1	0
svm, poly synthetic samples	0.530097	0.645161	0.527578	0.830189	0.527578	0.540816
svm, poly upsampled	0.584466	0.70442	0.611511	0.830619	0.611511	0.469388
grid, rbf kernel	0.809709	0.89485	1	0.809709	1	0
grid, rbf kernel synthetic samples	0.512621	0.61562	0.482014	0.851695	0.482014	0.642857
grid, rbf kernel upsampled	0.619417	0.737265	0.659472	0.835866	0.659472	0.44898
grid, sigmoid kernel	0.798058	0.885965	0.968825	0.816162	0.968825	0.0714286
grid, sigmoid kernel synthetic samples	0.547573	0.667618	0.561151	0.823944	0.561151	0.489796
grid, sigmoid kernel upsampled	0.565049	0.68272	0.577938	0.83391	0.577938	0.510204
random forest estimator	0.809709	0.89485	1	0.809709	1	0
random forest estimator synthetic samples	0.679612	0.797546	0.779376	0.816583	0.779376	0.255102
random forest estimator, upsampled	0.714563	0.828471	0.851319	0.806818	0.851319	0.132653
knn 10	0.786408	0.878855	0.956835	0.812627	0.956835	0.0612245
knn 10 synthetic samples	0.475728	0.589666	0.465228	0.804979	0.465228	0.520408
knn 10 upsampled	0.533981	0.661972	0.563549	0.802048	0.563549	0.408163

TABLE CVIII: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.605825	0.733945	0.864198	0.637813	0.864198	0.167539
Logistic regression synthetic samples	0.561165	0.607639	0.540123	0.694444	0.540123	0.596859
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.629126	0.772348	1	0.629126	1	0
svm, linear kernel, synthetic samples	0.545631	0.571429	0.481481	0.702703	0.481481	0.65445
svm, linear kernel upsampled samples	0.553398	0.615385	0.567901	0.671533	0.567901	0.528796
svm, poly	0.631068	0.770531	0.984568	0.632937	0.984568	0.0314136
svm, poly synthetic samples	0.535922	0.569369	0.487654	0.683983	0.487654	0.617801
svm, poly upsampled	0.557282	0.62623	0.589506	0.667832	0.589506	0.502618
grid, rbf kernel	0.61165	0.756691	0.959877	0.624498	0.959877	0.0209424
grid, rbf kernel synthetic samples	0.547573	0.598967	0.537037	0.677043	0.537037	0.565445
grid, rbf kernel upsampled	0.532039	0.606852	0.574074	0.643599	0.574074	0.460733
grid, sigmoid kernel	0.627184	0.767554	0.978395	0.631474	0.978395	0.0314136
grid, sigmoid kernel synthetic samples	0.543689	0.585538	0.512346	0.683128	0.512346	0.596859
grid, sigmoid kernel upsampled	0.549515	0.614618	0.570988	0.665468	0.570988	0.513089
random forest estimator	0.598058	0.731518	0.87037	0.630872	0.87037	0.136126
random forest estimator synthetic samples	0.565049	0.655385	0.657407	0.653374	0.657407	0.408377
random forest estimator, upsampled	0.598058	0.701299	0.75	0.658537	0.75	0.340314
knn 10	0.580583	0.696629	0.765432	0.639175	0.765432	0.267016
knn 10 synthetic samples	0.512621	0.561955	0.496914	0.646586	0.496914	0.539267
knn 10 upsampled	0.528155	0.600985	0.564815	0.642105	0.564815	0.465969

TABLE CIX: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.56699	0.402145	0.326087	0.524476	0.326087	0.761404
Logistic regression synthetic samples	0.543689	0.521385	0.556522	0.490421	0.556522	0.533333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.574757	0.262626	0.169565	0.58209	0.169565	0.901754
svm, linear kernel, synthetic samples	0.526214	0.508065	0.547826	0.473684	0.547826	0.508772
svm, linear kernel upsampled samples	0.530097	0.506122	0.53913	0.476923	0.53913	0.522807
svm, poly	0.570874	0.224561	0.13913	0.581818	0.13913	0.919298
svm, poly synthetic samples	0.553398	0.545455	0.6	0.5	0.6	0.515789
svm, poly upsampled	0.526214	0.521569	0.578261	0.475	0.578261	0.484211
grid, rbf kernel	0.570874	0.351906	0.26087	0.540541	0.26087	0.821053
grid, rbf kernel synthetic samples	0.549515	0.532258	0.573913	0.496241	0.573913	0.529825
grid, rbf kernel upsampled	0.545631	0.55	0.621739	0.493103	0.621739	0.484211
grid, sigmoid kernel	0.582524	0.326019	0.226087	0.58427	0.226087	0.870175
grid, sigmoid kernel synthetic samples	0.528155	0.496894	0.521739	0.474308	0.521739	0.533333
grid, sigmoid kernel upsampled	0.51068	0.511628	0.573913	0.461538	0.573913	0.459649
random forest estimator	0.584466	0.412088	0.326087	0.559701	0.326087	0.792982
random forest estimator synthetic samples	0.551456	0.498915	0.5	0.497835	0.5	0.592982
random forest estimator, upsampled	0.499029	0.532609	0.63913	0.456522	0.63913	0.385965
knn 10	0.52233	0.38806	0.33913	0.453488	0.33913	0.670175
knn 10 synthetic samples	0.47767	0.460922	0.5	0.427509	0.5	0.459649
knn 10 upsampled	0.502913	0.477551	0.508696	0.45	0.508696	0.498246

TABLE CX: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.97093	0.985222	0.996016	0.974659	0.996016	0.0714286
Logistic regression synthetic samples	0.625969	0.768307	0.63745	0.966767	0.63745	0.214286
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.972868	0.986248	1	0.972868	1	0
svm, linear kernel, synthetic samples	0.569767	0.7225	0.575697	0.969799	0.575697	0.357143
svm, linear kernel upsampled samples	0.602713	0.749082	0.609562	0.971429	0.609562	0.357143
svm, poly	0.972868	0.986248	1	0.972868	1	0
svm, poly synthetic samples	0.635659	0.775656	0.64741	0.967262	0.64741	0.214286
svm, poly upsampled	0.676357	0.806039	0.691235	0.966574	0.691235	0.142857
grid, rbf kernel	0.972868	0.986248	1	0.972868	1	0
grid, rbf kernel synthetic samples	0.794574	0.885281	0.814741	0.969194	0.814741	0.0714286
grid, rbf kernel upsampled	0.837209	0.911205	0.858566	0.970721	0.858566	0.0714286
grid, sigmoid kernel	0.97093	0.985251	0.998008	0.972816	0.998008	0
grid, sigmoid kernel synthetic samples	0.507752	0.666667	0.505976	0.976923	0.505976	0.571429
grid, sigmoid kernel upsampled	0.501938	0.662286	0.501992	0.972973	0.501992	0.5
random forest estimator	0.972868	0.986248	1	0.972868	1	0
random forest estimator synthetic samples	0.920543	0.958544	0.944223	0.973306	0.944223	0.0714286
random forest estimator, upsampled	0.97093	0.985251	0.998008	0.972816	0.998008	0
knn 10	0.972868	0.986248	1	0.972868	1	0
knn 10 synthetic samples	0.660853	0.793875	0.671315	0.971182	0.671315	0.285714
knn 10 upsampled	0.835271	0.909671	0.85259	0.974943	0.85259	0.214286

TABLE CXI: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.920543	0.958544	0.989562	0.929412	0.989562	0.027027
Logistic regression synthetic samples	0.556202	0.702983	0.565762	0.928082	0.565762	0.432432
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.928295	0.962814	1	0.928295	1	0
svm, linear kernel, synthetic samples	0.48062	0.631868	0.480167	0.923695	0.480167	0.486486
svm, linear kernel upsampled samples	0.651163	0.782082	0.674322	0.930836	0.674322	0.351351
svm, poly	0.928295	0.962814	1	0.928295	1	0
svm, poly synthetic samples	0.498062	0.647619	0.496868	0.929688	0.496868	0.513514
svm, poly upsampled	0.631783	0.76601	0.649269	0.933934	0.649269	0.405405
grid, rbf kernel	0.928295	0.962814	1	0.928295	1	0
grid, rbf kernel synthetic samples	0.540698	0.691004	0.553236	0.920139	0.553236	0.378378
grid, rbf kernel upsampled	0.624031	0.760494	0.643006	0.930514	0.643006	0.378378
grid, sigmoid kernel	0.912791	0.954128	0.977035	0.932271	0.977035	0.0810811
grid, sigmoid kernel synthetic samples	0.507752	0.656757	0.507307	0.931034	0.507307	0.513514
grid, sigmoid kernel upsampled	0.468992	0.620499	0.467641	0.921811	0.467641	0.486486
random forest estimator	0.928295	0.962814	1	0.928295	1	0
random forest estimator synthetic samples	0.823643	0.902465	0.878914	0.927313	0.878914	0.108108
random forest estimator, upsampled	0.922481	0.959596	0.991649	0.92955	0.991649	0.027027
knn 10	0.928295	0.962814	1	0.928295	1	0
knn 10 synthetic samples	0.544574	0.692005	0.551148	0.929577	0.551148	0.459459
knn 10 upsampled	0.608527	0.74813	0.626305	0.928793	0.626305	0.378378

TABLE CXII: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.782946	0.877996	0.98533	0.791749	0.98533	0.00934579
Logistic regression synthetic samples	0.544574	0.648729	0.530562	0.834615	0.530562	0.598131
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.792636	0.884324	1	0.792636	1	0
svm, linear kernel, synthetic samples	0.488372	0.580952	0.447433	0.828054	0.447433	0.64486
svm, linear kernel upsampled samples	0.563953	0.674385	0.569682	0.826241	0.569682	0.542056
svm, poly	0.78876	0.881907	0.99511	0.791829	0.99511	0
svm, poly synthetic samples	0.443798	0.517647	0.376528	0.827957	0.376528	0.700935
svm, poly upsampled	0.540698	0.639269	0.513447	0.846774	0.513447	0.64486
grid, rbf kernel	0.792636	0.884324	1	0.792636	1	0
grid, rbf kernel synthetic samples	0.49031	0.585827	0.454768	0.823009	0.454768	0.626168
grid, rbf kernel upsampled	0.565891	0.676301	0.572127	0.826855	0.572127	0.542056
grid, sigmoid kernel	0.77907	0.873894	0.96577	0.79798	0.96577	0.0654206
grid, sigmoid kernel synthetic samples	0.53876	0.652047	0.545232	0.810909	0.545232	0.514019
grid, sigmoid kernel upsampled	0.540698	0.642534	0.520782	0.838583	0.520782	0.616822
random forest estimator	0.792636	0.884324	1	0.792636	1	0
random forest estimator synthetic samples	0.682171	0.796526	0.784841	0.808564	0.784841	0.28972
random forest estimator, upsampled	0.751938	0.853211	0.909535	0.803456	0.909535	0.149533
knn 10	0.78876	0.881393	0.99022	0.794118	0.99022	0.0186916
knn 10 synthetic samples	0.482558	0.594841	0.479218	0.784	0.479218	0.495327
knn 10 upsampled	0.523256	0.648571	0.555012	0.780069	0.555012	0.401869

TABLE CXIII: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.620155	0.75	0.910217	0.637744	0.910217	0.134715
Logistic regression synthetic samples	0.579457	0.625216	0.560372	0.707031	0.560372	0.611399
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.625969	0.769964	1	0.625969	1	0
svm, linear kernel, synthetic samples	0.552326	0.574586	0.482972	0.709091	0.482972	0.668394
svm, linear kernel upsampled samples	0.565891	0.616438	0.557276	0.689655	0.557276	0.580311
svm, poly	0.625969	0.769415	0.996904	0.626459	0.996904	0.00518135
svm, poly synthetic samples	0.560078	0.583486	0.49226	0.716216	0.49226	0.673575
svm, poly upsampled	0.565891	0.619048	0.563467	0.686792	0.563467	0.569948
grid, rbf kernel	0.620155	0.763855	0.981424	0.625247	0.981424	0.015544
grid, rbf kernel synthetic samples	0.563953	0.588665	0.498452	0.71875	0.498452	0.673575
grid, rbf kernel upsampled	0.562016	0.620805	0.572755	0.677656	0.572755	0.544041
grid, sigmoid kernel	0.625969	0.759051	0.941176	0.635983	0.941176	0.0984456
grid, sigmoid kernel synthetic samples	0.540698	0.571429	0.489164	0.686957	0.489164	0.626943
grid, sigmoid kernel upsampled	0.546512	0.582143	0.504644	0.687764	0.504644	0.61658
random forest estimator	0.627907	0.752577	0.904025	0.644592	0.904025	0.165803
random forest estimator synthetic samples	0.583333	0.646962	0.609907	0.688811	0.609907	0.53886
random forest estimator, upsampled	0.604651	0.706897	0.76161	0.659517	0.76161	0.341969
knn 10	0.587209	0.696148	0.755418	0.645503	0.755418	0.305699
knn 10 synthetic samples	0.532946	0.568873	0.49226	0.673729	0.49226	0.601036
knn 10 upsampled	0.563953	0.632953	0.600619	0.668966	0.600619	0.502591

TABLE CXIV: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.569767	0.383333	0.3	0.530769	0.3	0.786713
Logistic regression synthetic samples	0.571705	0.555332	0.6	0.516854	0.6	0.548951
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.560078	0.0956175	0.0521739	0.571429	0.0521739	0.968531
svm, linear kernel, synthetic samples	0.567829	0.565302	0.630435	0.512367	0.630435	0.517483
svm, linear kernel upsampled samples	0.544574	0.534653	0.586957	0.490909	0.586957	0.51049
svm, poly	0.54845	0.064257	0.0347826	0.421053	0.0347826	0.961538
svm, poly synthetic samples	0.567829	0.563601	0.626087	0.512456	0.626087	0.520979
svm, poly upsampled	0.556202	0.544732	0.595652	0.501832	0.595652	0.524476
grid, rbf kernel	0.579457	0.29316	0.195652	0.584416	0.195652	0.888112
grid, rbf kernel synthetic samples	0.563953	0.526316	0.543478	0.510204	0.543478	0.58042
grid, rbf kernel upsampled	0.562016	0.544355	0.586957	0.507519	0.586957	0.541958
grid, sigmoid kernel	0.593023	0.423077	0.334783	0.574627	0.334783	0.800699
grid, sigmoid kernel synthetic samples	0.550388	0.558935	0.63913	0.496622	0.63913	0.479021
grid, sigmoid kernel upsampled	0.581395	0.584615	0.66087	0.524138	0.66087	0.517483
random forest estimator	0.579457	0.381766	0.291304	0.553719	0.291304	0.811189
random forest estimator synthetic samples	0.571705	0.507795	0.495652	0.520548	0.495652	0.632867
random forest estimator, upsampled	0.550388	0.567164	0.66087	0.496732	0.66087	0.461538
knn 10	0.54845	0.446556	0.408696	0.492147	0.408696	0.660839
knn 10 synthetic samples	0.534884	0.518072	0.56087	0.481343	0.56087	0.513986
knn 10 upsampled	0.511628	0.5	0.547826	0.459854	0.547826	0.482517

TABLE CXV: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.96325	0.981281	0.997996	0.965116	0.997996	0
Logistic regression synthetic samples	0.653772	0.789164	0.671343	0.957143	0.671343	0.166667
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.965184	0.982283	1	0.965184	1	0
svm, linear kernel, synthetic samples	0.618956	0.762936	0.635271	0.954819	0.635271	0.166667
svm, linear kernel upsampled samples	0.568665	0.722981	0.583166	0.95098	0.583166	0.166667
svm, poly	0.965184	0.982283	1	0.965184	1	0
svm, poly synthetic samples	0.636364	0.77458	0.647295	0.964179	0.647295	0.333333
svm, poly upsampled	0.588008	0.735404	0.593186	0.96732	0.593186	0.444444
grid, rbf kernel	0.965184	0.982283	1	0.965184	1	0
grid, rbf kernel synthetic samples	0.852998	0.920335	0.87976	0.964835	0.87976	0.111111
grid, rbf kernel upsampled	0.889749	0.941418	0.917836	0.966245	0.917836	0.111111
grid, sigmoid kernel	0.961315	0.980276	0.995992	0.965049	0.995992	0
grid, sigmoid kernel synthetic samples	0.578337	0.725441	0.577154	0.976271	0.577154	0.611111
grid, sigmoid kernel upsampled	0.495164	0.652463	0.490982	0.972222	0.490982	0.611111
random forest estimator	0.965184	0.982283	1	0.965184	1	0
random forest estimator synthetic samples	0.932302	0.964965	0.965932	0.964	0.965932	0
random forest estimator, upsampled	0.96325	0.981281	0.997996	0.965116	0.997996	0
knn 10	0.965184	0.982283	1	0.965184	1	0
knn 10 synthetic samples	0.711799	0.829324	0.725451	0.967914	0.725451	0.333333
knn 10 upsampled	0.874275	0.932642	0.901804	0.965665	0.901804	0.111111

TABLE CXVI: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.926499	0.961847	1	0.926499	1	0
Logistic regression synthetic samples	0.55706	0.69908	0.555324	0.943262	0.555324	0.578947
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.926499	0.961847	1	0.926499	1	0
svm, linear kernel, synthetic samples	0.512573	0.652893	0.494781	0.959514	0.494781	0.736842
svm, linear kernel upsampled samples	0.547389	0.68883	0.54071	0.948718	0.54071	0.631579
svm, poly	0.924565	0.960804	0.997912	0.926357	0.997912	0
svm, poly synthetic samples	0.524178	0.665761	0.511482	0.953307	0.511482	0.684211
svm, poly upsampled	0.529981	0.672065	0.519833	0.950382	0.519833	0.657895
grid, rbf kernel	0.926499	0.961847	1	0.926499	1	0
grid, rbf kernel synthetic samples	0.580271	0.721438	0.586639	0.936667	0.586639	0.5
grid, rbf kernel upsampled	0.638298	0.76942	0.651357	0.939759	0.651357	0.473684
grid, sigmoid kernel	0.918762	0.957576	0.989562	0.927593	0.989562	0.0263158
grid, sigmoid kernel synthetic samples	0.495164	0.64	0.484342	0.943089	0.484342	0.631579
grid, sigmoid kernel upsampled	0.545455	0.688742	0.542797	0.942029	0.542797	0.578947
random forest estimator	0.926499	0.961847	1	0.926499	1	0
random forest estimator synthetic samples	0.818182	0.898488	0.868476	0.930649	0.868476	0.184211
random forest estimator, upsampled	0.920696	0.958628	0.991649	0.927734	0.991649	0.0263158
knn 10	0.926499	0.961847	1	0.926499	1	0
knn 10 synthetic samples	0.572534	0.713359	0.574113	0.941781	0.574113	0.552632
knn 10 upsampled	0.646035	0.774908	0.65762	0.943114	0.65762	0.5

TABLE CXVII: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.796905	0.886241	0.997561	0.797271	0.997561	0.0280374
Logistic regression synthetic samples	0.528046	0.63253	0.512195	0.826772	0.512195	0.588785
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.793037	0.884574	1	0.793037	1	0
svm, linear kernel, synthetic samples	0.487427	0.577352	0.441463	0.834101	0.441463	0.663551
svm, linear kernel upsampled samples	0.537718	0.646972	0.534146	0.820225	0.534146	0.551402
svm, poly	0.789168	0.882162	0.995122	0.792233	0.995122	0
svm, poly synthetic samples	0.471954	0.554649	0.414634	0.837438	0.414634	0.691589
svm, poly upsampled	0.553191	0.655738	0.536585	0.842912	0.536585	0.616822
grid, rbf kernel	0.793037	0.884574	1	0.793037	1	0
grid, rbf kernel synthetic samples	0.481625	0.579937	0.45122	0.811404	0.45122	0.598131
grid, rbf kernel upsampled	0.518375	0.618683	0.492683	0.831276	0.492683	0.616822
grid, sigmoid kernel	0.7853	0.879217	0.985366	0.793713	0.985366	0.0186916
grid, sigmoid kernel synthetic samples	0.537718	0.648012	0.536585	0.817844	0.536585	0.542056
grid, sigmoid kernel upsampled	0.533849	0.649199	0.543902	0.805054	0.543902	0.495327
random forest estimator	0.793037	0.884574	1	0.793037	1	0
random forest estimator synthetic samples	0.694391	0.804938	0.795122	0.815	0.795122	0.308411
random forest estimator, upsampled	0.748549	0.849885	0.897561	0.807018	0.897561	0.17757
knn 10	0.777563	0.873208	0.965854	0.796781	0.965854	0.0560748
knn 10 synthetic samples	0.495164	0.601527	0.480488	0.804082	0.480488	0.551402
knn 10 upsampled	0.514507	0.634643	0.531707	0.787004	0.531707	0.448598

TABLE CXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.617021	0.745501	0.91195	0.630435	0.91195	0.145729
Logistic regression synthetic samples	0.555126	0.59364	0.528302	0.677419	0.528302	0.59799
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613153	0.760192	0.996855	0.614341	0.996855	0
svm, linear kernel, synthetic samples	0.541586	0.546845	0.449686	0.697561	0.449686	0.688442
svm, linear kernel upsampled samples	0.547389	0.576087	0.5	0.679487	0.5	0.623116
svm, poly	0.611219	0.758703	0.993711	0.613592	0.993711	0
svm, poly synthetic samples	0.549323	0.552783	0.45283	0.70936	0.45283	0.703518
svm, poly upsampled	0.560928	0.59246	0.518868	0.690377	0.518868	0.628141
grid, rbf kernel	0.611219	0.758703	0.993711	0.613592	0.993711	0
grid, rbf kernel synthetic samples	0.560928	0.56926	0.471698	0.717703	0.471698	0.703518
grid, rbf kernel upsampled	0.555126	0.596491	0.534591	0.674603	0.534591	0.58794
grid, sigmoid kernel	0.601547	0.746929	0.955975	0.612903	0.955975	0.0351759
grid, sigmoid kernel synthetic samples	0.547389	0.569853	0.487421	0.685841	0.487421	0.643216
grid, sigmoid kernel upsampled	0.537718	0.581436	0.522013	0.656126	0.522013	0.562814
random forest estimator	0.622824	0.751592	0.927673	0.631692	0.927673	0.135678
random forest estimator synthetic samples	0.582205	0.657143	0.650943	0.663462	0.650943	0.472362
random forest estimator, upsampled	0.574468	0.671642	0.707547	0.639205	0.707547	0.361809
knn 10	0.591876	0.702398	0.783019	0.636829	0.783019	0.286432
knn 10 synthetic samples	0.508704	0.541516	0.471698	0.635593	0.471698	0.567839
knn 10 upsampled	0.533849	0.58087	0.525157	0.649805	0.525157	0.547739

TABLE CXIX: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.595745	0.383481	0.27897	0.613208	0.27897	0.855634
Logistic regression synthetic samples	0.572534	0.54433	0.566524	0.52381	0.566524	0.577465
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.551257	0.0252101	0.0128755	0.6	0.0128755	0.992958
svm, linear kernel, synthetic samples	0.5706	0.539419	0.55794	0.522088	0.55794	0.580986
svm, linear kernel upsampled samples	0.568665	0.536383	0.553648	0.520161	0.553648	0.580986
svm, poly	0.549323	0.0717131	0.0386266	0.5	0.0386266	0.96831
svm, poly synthetic samples	0.572534	0.528785	0.532189	0.525424	0.532189	0.605634
svm, poly upsampled	0.586074	0.54661	0.553648	0.539749	0.553648	0.612676
grid, rbf kernel	0.580271	0.288525	0.188841	0.611111	0.188841	0.901408
grid, rbf kernel synthetic samples	0.562863	0.497778	0.480687	0.516129	0.480687	0.630282
grid, rbf kernel upsampled	0.576402	0.536998	0.545064	0.529167	0.545064	0.602113
grid, sigmoid kernel	0.597679	0.341772	0.23176	0.650602	0.23176	0.897887
grid, sigmoid kernel synthetic samples	0.584139	0.556701	0.579399	0.535714	0.579399	0.588028
grid, sigmoid kernel upsampled	0.574468	0.537815	0.549356	0.526749	0.549356	0.59507
random forest estimator	0.574468	0.395604	0.309013	0.549618	0.309013	0.792254
random forest estimator synthetic samples	0.5706	0.493151	0.463519	0.526829	0.463519	0.658451
random forest estimator, upsampled	0.545455	0.564007	0.652361	0.496732	0.652361	0.457746
knn 10	0.562863	0.420513	0.351931	0.522293	0.351931	0.735915
knn 10 synthetic samples	0.529981	0.498969	0.519313	0.480159	0.519313	0.538732
knn 10 upsampled	0.535783	0.487179	0.48927	0.485106	0.48927	0.573944

TABLE CXX: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.955598	0.97725	0.993964	0.961089	0.993964	0.047619
Logistic regression synthetic samples	0.700772	0.820394	0.712274	0.967213	0.712274	0.428571
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.959459	0.97931	1	0.959459	1	0
svm, linear kernel, synthetic samples	0.623552	0.762485	0.629779	0.966049	0.629779	0.47619
svm, linear kernel upsampled samples	0.708494	0.826237	0.722334	0.965054	0.722334	0.380952
svm, poly	0.959459	0.97931	1	0.959459	1	0
svm, poly synthetic samples	0.627413	0.765492	0.633803	0.966258	0.633803	0.47619
svm, poly upsampled	0.741313	0.849099	0.758551	0.964194	0.758551	0.333333
grid, rbf kernel	0.959459	0.97931	1	0.959459	1	0
grid, rbf kernel synthetic samples	0.818533	0.899142	0.843058	0.963218	0.843058	0.238095
grid, rbf kernel upsampled	0.864865	0.926931	0.89336	0.963124	0.89336	0.190476
grid, sigmoid kernel	0.957529	0.978304	0.997988	0.959381	0.997988	0
grid, sigmoid kernel synthetic samples	0.540541	0.692506	0.539235	0.967509	0.539235	0.571429
grid, sigmoid kernel upsampled	0.521236	0.677083	0.523139	0.95941	0.523139	0.47619
random forest estimator	0.959459	0.97931	1	0.959459	1	0
random forest estimator synthetic samples	0.907336	0.951417	0.945674	0.95723	0.945674	0
random forest estimator, upsampled	0.955598	0.977295	0.995976	0.959302	0.995976	0
knn 10	0.959459	0.97931	1	0.959459	1	0
knn 10 synthetic samples	0.681467	0.807018	0.694165	0.963687	0.694165	0.380952
knn 10 upsampled	0.84556	0.915789	0.875252	0.960265	0.875252	0.142857

TABLE CXXI: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.1 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.899614	0.947154	0.995726	0.903101	0.995726	0
Logistic regression synthetic samples	0.57722	0.715215	0.587607	0.913621	0.587607	0.48
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.903475	0.94929	1	0.903475	1	0
svm, linear kernel, synthetic samples	0.523166	0.665765	0.525641	0.907749	0.525641	0.5
svm, linear kernel upsampled samples	0.571429	0.711688	0.58547	0.907285	0.58547	0.44
svm, poly	0.903475	0.94929	1	0.903475	1	0
svm, poly synthetic samples	0.528958	0.671159	0.532051	0.908759	0.532051	0.5
svm, poly upsampled	0.563707	0.704961	0.576923	0.90604	0.576923	0.44
grid, rbf kernel	0.903475	0.94929	1	0.903475	1	0
grid, rbf kernel synthetic samples	0.633205	0.764851	0.660256	0.908824	0.660256	0.38
grid, rbf kernel upsampled	0.642857	0.774115	0.67735	0.903134	0.67735	0.32
grid, sigmoid kernel	0.891892	0.942857	0.987179	0.902344	0.987179	0
grid, sigmoid kernel synthetic samples	0.5	0.64177	0.495726	0.909804	0.495726	0.54
grid, sigmoid kernel upsampled	0.445946	0.590585	0.442308	0.888412	0.442308	0.48
random forest estimator	0.903475	0.94929	1	0.903475	1	0
random forest estimator synthetic samples	0.851351	0.919203	0.935897	0.903093	0.935897	0.06
random forest estimator, upsampled	0.903475	0.949084	0.995726	0.906615	0.995726	0.04
knn 10	0.903475	0.94929	1	0.903475	1	0
knn 10 synthetic samples	0.567568	0.707572	0.57906	0.909396	0.57906	0.46
knn 10 upsampled	0.662162	0.787879	0.694444	0.910364	0.694444	0.36

TABLE CXXII: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.15 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.781853	0.87704	0.995062	0.784047	0.995062	0.0176991
Logistic regression synthetic samples	0.534749	0.635401	0.518519	0.820312	0.518519	0.59292
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.781853	0.877573	1	0.781853	1	0
svm, linear kernel, synthetic samples	0.492278	0.575121	0.439506	0.831776	0.439506	0.681416
svm, linear kernel upsampled samples	0.505792	0.594937	0.464198	0.828194	0.464198	0.654867
svm, poly	0.781853	0.877573	1	0.781853	1	0
svm, poly synthetic samples	0.465251	0.539101	0.4	0.826531	0.4	0.699115
svm, poly upsampled	0.528958	0.623457	0.498765	0.831276	0.498765	0.637168
grid, rbf kernel	0.781853	0.877573	1	0.781853	1	0
grid, rbf kernel synthetic samples	0.532819	0.631098	0.511111	0.824701	0.511111	0.610619
grid, rbf kernel upsampled	0.583012	0.686957	0.585185	0.831579	0.585185	0.575221
grid, sigmoid kernel	0.77027	0.868798	0.97284	0.784861	0.97284	0.0442478
grid, sigmoid kernel synthetic samples	0.544402	0.653959	0.550617	0.805054	0.550617	0.522124
grid, sigmoid kernel upsampled	0.534749	0.627512	0.501235	0.838843	0.501235	0.654867
random forest estimator	0.781853	0.877573	1	0.781853	1	0
random forest estimator synthetic samples	0.677606	0.795092	0.8	0.790244	0.8	0.238938
random forest estimator, upsampled	0.708494	0.824623	0.876543	0.778509	0.876543	0.106195
knn 10	0.776062	0.872527	0.980247	0.786139	0.980247	0.0442478
knn 10 synthetic samples	0.505792	0.608563	0.491358	0.799197	0.491358	0.557522
knn 10 upsampled	0.542471	0.658993	0.565432	0.789655	0.565432	0.460177

TABLE CXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.621622	0.751899	0.913846	0.63871	0.913846	0.129534
Logistic regression synthetic samples	0.559846	0.604167	0.535385	0.693227	0.535385	0.601036
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.627413	0.771056	1	0.627413	1	0
svm, linear kernel, synthetic samples	0.544402	0.584507	0.510769	0.683128	0.510769	0.601036
svm, linear kernel upsampled samples	0.57529	0.627119	0.569231	0.698113	0.569231	0.585492
svm, poly	0.625483	0.769596	0.996923	0.626692	0.996923	0
svm, poly synthetic samples	0.57722	0.624357	0.56	0.705426	0.56	0.606218
svm, poly upsampled	0.57722	0.642741	0.606154	0.684028	0.606154	0.528497
grid, rbf kernel	0.631274	0.772348	0.996923	0.63035	0.996923	0.015544
grid, rbf kernel synthetic samples	0.561776	0.615905	0.56	0.684211	0.56	0.564767
grid, rbf kernel upsampled	0.594595	0.664537	0.64	0.69103	0.64	0.518135
grid, sigmoid kernel	0.625483	0.766827	0.981538	0.629191	0.981538	0.0259067
grid, sigmoid kernel synthetic samples	0.608108	0.649396	0.578462	0.740157	0.578462	0.658031
grid, sigmoid kernel upsampled	0.590734	0.631944	0.56	0.7251	0.56	0.642487
random forest estimator	0.610039	0.741688	0.892308	0.634573	0.892308	0.134715
random forest estimator synthetic samples	0.581081	0.650564	0.621538	0.682432	0.621538	0.512953
random forest estimator, upsampled	0.6139	0.711816	0.76	0.669377	0.76	0.367876
knn 10	0.583012	0.696629	0.763077	0.640827	0.763077	0.279793
knn 10 synthetic samples	0.542471	0.584939	0.513846	0.678862	0.513846	0.590674
knn 10 upsampled	0.528958	0.596026	0.553846	0.645161	0.553846	0.487047

TABLE CXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.565637	0.4	0.321888	0.528169	0.321888	0.764912
Logistic regression synthetic samples	0.550193	0.54224	0.592275	0.5	0.592275	0.515789
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.57529	0.172932	0.0987124	0.69697	0.0987124	0.964912
svm, linear kernel, synthetic samples	0.552124	0.537849	0.579399	0.501859	0.579399	0.529825
svm, linear kernel upsampled samples	0.513514	0.507812	0.55794	0.46595	0.55794	0.477193
svm, poly	0.571429	0.159091	0.0901288	0.677419	0.0901288	0.964912
svm, poly synthetic samples	0.53861	0.515213	0.545064	0.488462	0.545064	0.533333
svm, poly upsampled	0.525097	0.504032	0.536481	0.475285	0.536481	0.515789
grid, rbf kernel	0.581081	0.344411	0.244635	0.581633	0.244635	0.85614
grid, rbf kernel synthetic samples	0.540541	0.506224	0.523605	0.48996	0.523605	0.554386
grid, rbf kernel upsampled	0.517375	0.472574	0.480687	0.46473	0.480687	0.547368
grid, sigmoid kernel	0.573359	0.213523	0.128755	0.625	0.128755	0.936842
grid, sigmoid kernel synthetic samples	0.53861	0.530452	0.579399	0.48913	0.579399	0.505263
grid, sigmoid kernel upsampled	0.548263	0.55	0.613734	0.498258	0.613734	0.494737
random forest estimator	0.586873	0.412088	0.321888	0.572519	0.321888	0.803509
random forest estimator synthetic samples	0.559846	0.504348	0.497854	0.511013	0.497854	0.610526
random forest estimator, upsampled	0.525097	0.544444	0.630901	0.478827	0.630901	0.438596
knn 10	0.565637	0.418605	0.347639	0.525974	0.347639	0.74386
knn 10 synthetic samples	0.517375	0.476987	0.48927	0.465306	0.48927	0.540351
knn 10 upsampled	0.565637	0.526316	0.536481	0.516529	0.536481	0.589474

TABLE CXXV: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.775926	0.873298	0.995227	0.777985	0.995227	0.0165289
Logistic regression synthetic samples	0.590741	0.697674	0.608592	0.817308	0.608592	0.528926
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.775926	0.873827	1	0.775926	1	0
svm, linear kernel, synthetic samples	0.577778	0.672414	0.558473	0.844765	0.558473	0.644628
svm, linear kernel upsampled samples	0.605556	0.703755	0.603819	0.843333	0.603819	0.61157
svm, poly	0.775926	0.873827	1	0.775926	1	0
svm, poly synthetic samples	0.551852	0.650289	0.536993	0.824176	0.536993	0.603306
svm, poly upsampled	0.603704	0.705234	0.610979	0.833876	0.610979	0.578512
grid, rbf kernel	0.775926	0.873827	1	0.775926	1	0
grid, rbf kernel synthetic samples	0.605556	0.715621	0.639618	0.812121	0.639618	0.487603
grid, rbf kernel upsampled	0.644444	0.753846	0.701671	0.814404	0.701671	0.446281
grid, sigmoid kernel	0.77037	0.869198	0.983294	0.778828	0.983294	0.0330579
grid, sigmoid kernel synthetic samples	0.503704	0.616046	0.513126	0.770609	0.513126	0.471074
grid, sigmoid kernel upsampled	0.512963	0.617176	0.505967	0.791045	0.505967	0.53719
random forest estimator	0.775926	0.873827	1	0.775926	1	0
random forest estimator synthetic samples	0.67963	0.795266	0.801909	0.788732	0.801909	0.256198
random forest estimator, upsampled	0.748148	0.84989	0.918854	0.790554	0.918854	0.157025
logistic regression	0.777778	0.87395	0.99284	0.780488	0.99284	0.0330579
logistic regression synthetic samples	0.590741	0.697674	0.608592	0.817308	0.608592	0.528926
logistic regression upsampled	0.614815	0.723404	0.649165	0.816817	0.649165	0.495868
knn 10	0.77037	0.869748	0.988067	0.776735	0.988067	0.0165289
knn 10 synthetic samples	0.548148	0.664835	0.577566	0.783172	0.577566	0.446281
knn 10 upsampled	0.581481	0.701058	0.632458	0.78635	0.632458	0.404959

TABLE CXXVI: Numerical results of ML methods, using data between time of birth + 1 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.605556	0.730721	0.889231	0.620172	0.889231	0.176744
Logistic regression synthetic samples	0.57963	0.62603	0.584615	0.673759	0.584615	0.572093
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.6	0.74942	0.993846	0.60149	0.993846	0.00465116
svm, linear kernel, synthetic samples	0.55	0.588832	0.535385	0.654135	0.535385	0.572093
svm, linear kernel upsampled samples	0.574074	0.619205	0.575385	0.670251	0.575385	0.572093
svm, poly	0.609259	0.750885	0.978462	0.609195	0.978462	0.0511628
svm, poly synthetic samples	0.553704	0.589438	0.532308	0.660305	0.532308	0.586047
svm, poly upsampled	0.577778	0.61745	0.566154	0.678967	0.566154	0.595349
grid, rbf kernel	0.609259	0.747305	0.96	0.611765	0.96	0.0790698
grid, rbf kernel synthetic samples	0.561111	0.606965	0.563077	0.658273	0.563077	0.55814
grid, rbf kernel upsampled	0.57037	0.614618	0.569231	0.66787	0.569231	0.572093
grid, sigmoid kernel	0.553704	0.668501	0.747692	0.604478	0.747692	0.260465
grid, sigmoid kernel synthetic samples	0.522222	0.568562	0.523077	0.622711	0.523077	0.52093
grid, sigmoid kernel upsampled	0.487037	0.524871	0.470769	0.593023	0.470769	0.511628
random forest estimator	0.609259	0.736579	0.907692	0.619748	0.907692	0.15814
random forest estimator synthetic samples	0.572222	0.65053	0.661538	0.639881	0.661538	0.437209
random forest estimator, upsampled	0.594444	0.693706	0.763077	0.635897	0.763077	0.339535
logistic regression	0.598148	0.726356	0.886154	0.615385	0.886154	0.162791
logistic regression synthetic samples	0.577778	0.625	0.584615	0.671378	0.584615	0.567442
logistic regression upsampled	0.581481	0.634304	0.603077	0.668942	0.603077	0.548837
knn 10	0.538889	0.651748	0.716923	0.597436	0.716923	0.269767
knn 10 synthetic samples	0.514815	0.535461	0.464615	0.631799	0.464615	0.590698
knn 10 upsampled	0.483333	0.523077	0.470769	0.588462	0.470769	0.502326

TABLE CXXVII: Numerical results of ML methods, using data between time of birth + 1 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.581481	0.323353	0.247706	0.465517	0.247706	0.807453
Logistic regression synthetic samples	0.514815	0.44958	0.490826	0.414729	0.490826	0.531056
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.583333	0.237288	0.16055	0.454545	0.16055	0.869565
svm, linear kernel, synthetic samples	0.544444	0.472103	0.504587	0.443548	0.504587	0.571429
svm, linear kernel upsampled samples	0.572222	0.380697	0.325688	0.458065	0.325688	0.73913
svm, poly	0.590741	0.219081	0.142202	0.476923	0.142202	0.89441
svm, poly synthetic samples	0.555556	0.464286	0.477064	0.452174	0.477064	0.608696
svm, poly upsampled	0.564815	0.345404	0.284404	0.439716	0.284404	0.754658
grid, rbf kernel	0.585185	0.248322	0.169725	0.4625	0.169725	0.86646
grid, rbf kernel synthetic samples	0.542593	0.452328	0.46789	0.437768	0.46789	0.593168
grid, rbf kernel upsampled	0.553704	0.435597	0.426606	0.444976	0.426606	0.639752
grid, sigmoid kernel	0.524074	0.389549	0.376147	0.403941	0.376147	0.624224
grid, sigmoid kernel synthetic samples	0.507407	0.46371	0.527523	0.413669	0.527523	0.493789
grid, sigmoid kernel upsampled	0.507407	0.47012	0.541284	0.415493	0.541284	0.484472
random forest estimator	0.581481	0.335294	0.261468	0.467213	0.261468	0.798137
random forest estimator synthetic samples	0.542593	0.442438	0.449541	0.435556	0.449541	0.60559
random forest estimator, upsampled	0.512963	0.524412	0.665138	0.432836	0.665138	0.409938
logistic regression	0.587037	0.342183	0.266055	0.479339	0.266055	0.804348
logistic regression synthetic samples	0.514815	0.44958	0.490826	0.414729	0.490826	0.531056
logistic regression upsampled	0.548148	0.462555	0.481651	0.444915	0.481651	0.593168
knn 10	0.525926	0.311828	0.266055	0.376623	0.266055	0.701863
knn 10 synthetic samples	0.518519	0.444444	0.477064	0.416	0.477064	0.546584
knn 10 upsampled	0.505556	0.433121	0.46789	0.403162	0.46789	0.531056

TABLE CXXVIII: Numerical results of ML methods, using data between time of birth + 1 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.774436	0.87234	0.997567	0.775047	0.997567	0.0165289
Logistic regression synthetic samples	0.588346	0.686695	0.583942	0.833333	0.583942	0.603306
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.772556	0.871686	1	0.772556	1	0
svm, linear kernel, synthetic samples	0.543233	0.627871	0.498783	0.847107	0.498783	0.694215
svm, linear kernel upsampled samples	0.578947	0.680912	0.581509	0.821306	0.581509	0.570248
svm, poly	0.772556	0.871686	1	0.772556	1	0
svm, poly synthetic samples	0.550752	0.643815	0.525547	0.830769	0.525547	0.636364
svm, poly upsampled	0.588346	0.697931	0.615572	0.805732	0.615572	0.495868
grid, rbf kernel	0.772556	0.871686	1	0.772556	1	0
grid, rbf kernel synthetic samples	0.569549	0.67701	0.583942	0.805369	0.583942	0.520661
grid, rbf kernel upsampled	0.607143	0.726797	0.676399	0.785311	0.676399	0.371901
grid, sigmoid kernel	0.738722	0.846069	0.92944	0.776423	0.92944	0.0909091
grid, sigmoid kernel synthetic samples	0.550752	0.657102	0.557178	0.800699	0.557178	0.528926
grid, sigmoid kernel upsampled	0.565789	0.676923	0.588808	0.796053	0.588808	0.487603
random forest estimator	0.772556	0.871686	1	0.772556	1	0
random forest estimator synthetic samples	0.671053	0.786845	0.785888	0.787805	0.785888	0.280992
random forest estimator, upsampled	0.729323	0.837838	0.905109	0.779874	0.905109	0.132231
logistic regression	0.776316	0.873539	1	0.775472	1	0.0165289
logistic regression synthetic samples	0.588346	0.686695	0.583942	0.833333	0.583942	0.603306
logistic regression upsampled	0.582707	0.683761	0.583942	0.824742	0.583942	0.578512
knn 10	0.763158	0.865096	0.982968	0.772467	0.982968	0.0165289
knn 10 synthetic samples	0.530075	0.635569	0.530414	0.792727	0.530414	0.528926
knn 10 upsampled	0.571429	0.687671	0.610706	0.786834	0.610706	0.438017

TABLE CXXIX: Numerical results of ML methods, using data between time of birth + 2 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.580827	0.722981	0.954098	0.582	0.954098	0.0792952
Logistic regression synthetic samples	0.556391	0.577061	0.527869	0.636364	0.527869	0.594714
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.573308	0.728793	1	0.573308	1	0
svm, linear kernel, synthetic samples	0.524436	0.465116	0.360656	0.654762	0.360656	0.744493
svm, linear kernel upsampled samples	0.565789	0.603774	0.577049	0.633094	0.577049	0.550661
svm, poly	0.573308	0.727491	0.993443	0.573864	0.993443	0.00881057
svm, poly synthetic samples	0.530075	0.49187	0.396721	0.647059	0.396721	0.709251
svm, poly upsampled	0.571429	0.631068	0.639344	0.623003	0.639344	0.480176
grid, rbf kernel	0.571429	0.723301	0.977049	0.574181	0.977049	0.0264317
grid, rbf kernel synthetic samples	0.518797	0.509579	0.436066	0.612903	0.436066	0.629956
grid, rbf kernel upsampled	0.513158	0.570481	0.563934	0.577181	0.563934	0.444934
grid, sigmoid kernel	0.541353	0.658263	0.770492	0.574572	0.770492	0.23348
grid, sigmoid kernel synthetic samples	0.537594	0.594059	0.590164	0.598007	0.590164	0.46696
grid, sigmoid kernel upsampled	0.550752	0.602329	0.593443	0.611486	0.593443	0.493392
random forest estimator	0.578947	0.717884	0.934426	0.582822	0.934426	0.101322
random forest estimator synthetic samples	0.550752	0.623622	0.64918	0.6	0.64918	0.418502
random forest estimator, upsampled	0.546992	0.655222	0.75082	0.581218	0.75082	0.273128
logistic regression	0.577068	0.719801	0.947541	0.580321	0.947541	0.0792952
logistic regression synthetic samples	0.556391	0.577061	0.527869	0.636364	0.527869	0.594714
logistic regression upsampled	0.565789	0.60781	0.586885	0.630282	0.586885	0.537445
knn 10	0.524436	0.647141	0.760656	0.563107	0.760656	0.207048
knn 10 synthetic samples	0.50188	0.510166	0.452459	0.584746	0.452459	0.568282
knn 10 upsampled	0.503759	0.562914	0.557377	0.568562	0.557377	0.431718

TABLE CXXX: Numerical results of ML methods, using data between time of birth + 2 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.601504	0.23741	0.160194	0.458333	0.160194	0.880368
Logistic regression synthetic samples	0.520677	0.460888	0.529126	0.40824	0.529126	0.515337
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.610902	0.028169	0.0145631	0.428571	0.0145631	0.98773
svm, linear kernel, synthetic samples	0.507519	0.46748	0.558252	0.402098	0.558252	0.47546
svm, linear kernel upsampled samples	0.569549	0.420253	0.402913	0.439153	0.402913	0.674847
svm, poly	0.618421	0.0287081	0.0145631	1	0.0145631	1
svm, poly synthetic samples	0.486842	0.487805	0.631068	0.397554	0.631068	0.395706
svm, poly upsampled	0.56391	0.42	0.407767	0.43299	0.407767	0.662577
grid, rbf kernel	0.605263	0.0869565	0.0485437	0.416667	0.0485437	0.957055
grid, rbf kernel synthetic samples	0.486842	0.461538	0.567961	0.388704	0.567961	0.435583
grid, rbf kernel upsampled	0.541353	0.447964	0.480583	0.419492	0.480583	0.579755
grid, sigmoid kernel	0.573308	0.338192	0.281553	0.423358	0.281553	0.757669
grid, sigmoid kernel synthetic samples	0.516917	0.427617	0.466019	0.395062	0.466019	0.54908
grid, sigmoid kernel upsampled	0.496241	0.464	0.563107	0.394558	0.563107	0.453988
random forest estimator	0.593985	0.275168	0.199029	0.445652	0.199029	0.843558
random forest estimator synthetic samples	0.543233	0.451467	0.485437	0.421941	0.485437	0.579755
random forest estimator, upsampled	0.496241	0.48855	0.621359	0.402516	0.621359	0.417178
logistic regression	0.601504	0.253521	0.174757	0.461538	0.174757	0.871166
logistic regression synthetic samples	0.520677	0.460888	0.529126	0.40824	0.529126	0.515337
logistic regression upsampled	0.535714	0.439909	0.470874	0.412766	0.470874	0.576687
knn 10	0.569549	0.379404	0.339806	0.429448	0.339806	0.714724
knn 10 synthetic samples	0.488722	0.451613	0.543689	0.386207	0.543689	0.453988
knn 10 upsampled	0.526316	0.447368	0.495146	0.408	0.495146	0.546012

TABLE CXXXI: Numerical results of ML methods, using data between time of birth + 2 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.753346	0.859016	0.992424	0.757225	0.992424	0.00787402
Logistic regression synthetic samples	0.535373	0.643172	0.55303	0.768421	0.55303	0.480315
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.75717	0.861806	1	0.75717	1	0
svm, linear kernel, synthetic samples	0.539197	0.645066	0.55303	0.773852	0.55303	0.496063
svm, linear kernel upsampled samples	0.562141	0.66373	0.570707	0.792982	0.570707	0.535433
svm, poly	0.75717	0.861806	1	0.75717	1	0
svm, poly synthetic samples	0.56979	0.679943	0.603535	0.778502	0.603535	0.464567
svm, poly upsampled	0.560229	0.666667	0.580808	0.782313	0.580808	0.496063
grid, rbf kernel	0.75717	0.861806	1	0.75717	1	0
grid, rbf kernel synthetic samples	0.560229	0.675141	0.603535	0.766026	0.603535	0.425197
grid, rbf kernel upsampled	0.600382	0.72391	0.691919	0.759003	0.691919	0.314961
grid, sigmoid kernel	0.728489	0.840449	0.944444	0.757085	0.944444	0.0551181
grid, sigmoid kernel synthetic samples	0.552581	0.655882	0.563131	0.785211	0.563131	0.519685
grid, sigmoid kernel upsampled	0.510516	0.612121	0.510101	0.765152	0.510101	0.511811
random forest estimator	0.75717	0.861806	1	0.75717	1	0
random forest estimator synthetic samples	0.676864	0.788486	0.795455	0.781638	0.795455	0.307087
random forest estimator, upsampled	0.726577	0.835821	0.919192	0.766316	0.919192	0.125984
logistic regression	0.751434	0.857768	0.989899	0.756757	0.989899	0.00787402
logistic regression synthetic samples	0.533461	0.642229	0.55303	0.765734	0.55303	0.472441
logistic regression upsampled	0.552581	0.658892	0.570707	0.77931	0.570707	0.496063
knn 10	0.74761	0.85558	0.987374	0.754826	0.987374	0
knn 10 synthetic samples	0.529637	0.627273	0.522727	0.784091	0.522727	0.551181
knn 10 upsampled	0.556405	0.663768	0.578283	0.778912	0.578283	0.488189

TABLE CXXXII: Numerical results of ML methods, using data between time of birth + 3 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.594646	0.731646	0.953795	0.593429	0.953795	0.1
Logistic regression synthetic samples	0.544933	0.600671	0.590759	0.610922	0.590759	0.481818
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.57935	0.733656	1	0.57935	1	0
svm, linear kernel, synthetic samples	0.535373	0.572935	0.537954	0.612782	0.537954	0.531818
svm, linear kernel upsampled samples	0.539197	0.579407	0.547855	0.614815	0.547855	0.527273
svm, poly	0.585086	0.735043	0.993399	0.583333	0.993399	0.0227273
svm, poly synthetic samples	0.548757	0.583039	0.544554	0.627376	0.544554	0.554545
svm, poly upsampled	0.554493	0.614876	0.613861	0.615894	0.613861	0.472727
grid, rbf kernel	0.583174	0.732843	0.986799	0.582846	0.986799	0.0272727
grid, rbf kernel synthetic samples	0.523901	0.587065	0.584158	0.59	0.584158	0.440909
grid, rbf kernel upsampled	0.548757	0.628931	0.660066	0.600601	0.660066	0.395455
grid, sigmoid kernel	0.583174	0.717617	0.914191	0.590618	0.914191	0.127273
grid, sigmoid kernel synthetic samples	0.506692	0.556701	0.534653	0.580645	0.534653	0.468182
grid, sigmoid kernel upsampled	0.499044	0.561873	0.554455	0.569492	0.554455	0.422727
random forest estimator	0.590822	0.731156	0.960396	0.590264	0.960396	0.0818182
random forest estimator synthetic samples	0.592734	0.678733	0.742574	0.625	0.742574	0.386364
random forest estimator, upsampled	0.585086	0.689557	0.79538	0.608586	0.79538	0.295455
logistic regression	0.592734	0.728662	0.943894	0.593361	0.943894	0.109091
logistic regression synthetic samples	0.544933	0.600671	0.590759	0.610922	0.590759	0.481818
logistic regression upsampled	0.544933	0.597973	0.584158	0.612457	0.584158	0.490909
knn 10	0.565966	0.677098	0.785479	0.595	0.785479	0.263636
knn 10 synthetic samples	0.544933	0.568841	0.518152	0.630522	0.518152	0.581818
knn 10 upsampled	0.525813	0.585284	0.577558	0.59322	0.577558	0.454545

TABLE CXXXIII: Numerical results of ML methods, using data between time of birth + 3 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.646272	0.268775	0.182796	0.507463	0.182796	0.902077
Logistic regression synthetic samples	0.518164	0.449782	0.553763	0.378676	0.553763	0.498516
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.638623	0.0307692	0.016129	0.333333	0.016129	0.982196
svm, linear kernel, synthetic samples	0.49522	0.428571	0.532258	0.358696	0.532258	0.474777
svm, linear kernel upsampled samples	0.506692	0.40553	0.473118	0.354839	0.473118	0.525223
svm, poly	0.638623	0.0502513	0.0268817	0.384615	0.0268817	0.976261
svm, poly synthetic samples	0.512428	0.45629	0.575269	0.378092	0.575269	0.477745
svm, poly upsampled	0.525813	0.420561	0.483871	0.371901	0.483871	0.548961
grid, rbf kernel	0.636711	0.103774	0.0591398	0.423077	0.0591398	0.95549
grid, rbf kernel synthetic samples	0.527725	0.407674	0.456989	0.367965	0.456989	0.566766
grid, rbf kernel upsampled	0.502868	0.409091	0.483871	0.354331	0.483871	0.513353
grid, sigmoid kernel	0.552581	0.380952	0.387097	0.375	0.387097	0.643917
grid, sigmoid kernel synthetic samples	0.537285	0.369792	0.38172	0.358586	0.38172	0.623145
grid, sigmoid kernel upsampled	0.556405	0.411168	0.435484	0.389423	0.435484	0.623145
random forest estimator	0.596558	0.269896	0.209677	0.378641	0.209677	0.810089
random forest estimator synthetic samples	0.537285	0.39196	0.419355	0.367925	0.419355	0.602374
random forest estimator, upsampled	0.478011	0.476008	0.666667	0.370149	0.666667	0.373887
logistic regression	0.632887	0.272727	0.193548	0.461538	0.193548	0.875371
logistic regression synthetic samples	0.520076	0.450766	0.553763	0.380074	0.553763	0.501484
logistic regression upsampled	0.521989	0.439462	0.526882	0.376923	0.526882	0.519288
knn 10	0.567878	0.354286	0.333333	0.378049	0.333333	0.697329
knn 10 synthetic samples	0.508604	0.417234	0.494624	0.360784	0.494624	0.51632
knn 10 upsampled	0.499044	0.427948	0.526882	0.360294	0.526882	0.48368

TABLE CXXXIV: Numerical results of ML methods, using data between time of birth + 3 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.776471	0.873051	0.984925	0.784	0.984925	0.0357143
Logistic regression synthetic samples	0.537255	0.64881	0.547739	0.79562	0.547739	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.780392	0.876652	1	0.780392	1	0
svm, linear kernel, synthetic samples	0.52549	0.623053	0.502513	0.819672	0.502513	0.607143
svm, linear kernel upsampled samples	0.57451	0.680412	0.580402	0.822064	0.580402	0.553571
svm, poly	0.77451	0.872647	0.98995	0.780198	0.98995	0.00892857
svm, poly synthetic samples	0.515686	0.613459	0.492462	0.813278	0.492462	0.598214
svm, poly upsampled	0.545098	0.66474	0.577889	0.782313	0.577889	0.428571
grid, rbf kernel	0.772549	0.871681	0.98995	0.778656	0.98995	0
grid, rbf kernel synthetic samples	0.505882	0.612308	0.5	0.789683	0.5	0.526786
grid, rbf kernel upsampled	0.539216	0.664765	0.585427	0.768977	0.585427	0.375
grid, sigmoid kernel	0.754902	0.858116	0.949749	0.782609	0.949749	0.0625
grid, sigmoid kernel synthetic samples	0.484314	0.588419	0.472362	0.780083	0.472362	0.526786
grid, sigmoid kernel upsampled	0.535294	0.647845	0.547739	0.792727	0.547739	0.491071
random forest estimator	0.780392	0.876652	1	0.780392	1	0
random forest estimator synthetic samples	0.676471	0.795031	0.80402	0.786241	0.80402	0.223214
random forest estimator, upsampled	0.745098	0.849537	0.922111	0.787554	0.922111	0.116071
logistic regression	0.776471	0.873051	0.984925	0.784	0.984925	0.0357143
logistic regression synthetic samples	0.537255	0.64881	0.547739	0.79562	0.547739	0.5
logistic regression upsampled	0.570588	0.681223	0.58794	0.809689	0.58794	0.508929
knn 10	0.768627	0.868304	0.977387	0.781124	0.977387	0.0267857
knn 10 synthetic samples	0.507843	0.613251	0.5	0.792829	0.5	0.535714
knn 10 upsampled	0.539216	0.662841	0.580402	0.772575	0.580402	0.392857

TABLE CXXXV: Numerical results of ML methods, using data between time of birth + 4 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.592157	0.723404	0.888889	0.609865	0.888889	0.147059
Logistic regression synthetic samples	0.547059	0.594025	0.552288	0.642586	0.552288	0.539216
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.594118	0.74476	0.986928	0.59802	0.986928	0.00490196
svm, linear kernel, synthetic samples	0.521569	0.541353	0.470588	0.637168	0.470588	0.598039
svm, linear kernel upsampled samples	0.554902	0.619765	0.604575	0.635739	0.604575	0.480392
svm, poly	0.596078	0.745679	0.986928	0.599206	0.986928	0.00980392
svm, poly synthetic samples	0.527451	0.57041	0.522876	0.627451	0.522876	0.534314
svm, poly upsampled	0.566667	0.635914	0.630719	0.641196	0.630719	0.470588
grid, rbf kernel	0.592157	0.74	0.96732	0.59919	0.96732	0.0294118
grid, rbf kernel synthetic samples	0.545098	0.585714	0.535948	0.645669	0.535948	0.558824
grid, rbf kernel upsampled	0.578431	0.646962	0.643791	0.650165	0.643791	0.480392
grid, sigmoid kernel	0.586275	0.717537	0.875817	0.60771	0.875817	0.151961
grid, sigmoid kernel synthetic samples	0.539216	0.568807	0.506536	0.648536	0.506536	0.588235
grid, sigmoid kernel upsampled	0.52549	0.585616	0.558824	0.615108	0.558824	0.47549
random forest estimator	0.596078	0.73107	0.915033	0.608696	0.915033	0.117647
random forest estimator synthetic samples	0.55098	0.634769	0.650327	0.619938	0.650327	0.401961
random forest estimator, upsampled	0.572549	0.679412	0.754902	0.617647	0.754902	0.29902
logistic regression	0.590196	0.720961	0.882353	0.609481	0.882353	0.151961
logistic regression synthetic samples	0.547059	0.594025	0.552288	0.642586	0.552288	0.539216
logistic regression upsampled	0.54902	0.606164	0.578431	0.636691	0.578431	0.504902
knn 10	0.57451	0.679468	0.751634	0.619946	0.751634	0.308824
knn 10 synthetic samples	0.511765	0.51272	0.428105	0.639024	0.428105	0.637255
knn 10 upsampled	0.541176	0.599315	0.571895	0.629496	0.571895	0.495098

TABLE CXXXVI: Numerical results of ML methods, using data between time of birth + 4 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.590196	0.281787	0.20098	0.471264	0.20098	0.849673
Logistic regression synthetic samples	0.494118	0.436681	0.490196	0.393701	0.490196	0.496732
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.6	0.00970874	0.00490196	0.5	0.00490196	0.996732
svm, linear kernel, synthetic samples	0.480392	0.455852	0.544118	0.392226	0.544118	0.437908
svm, linear kernel upsampled samples	0.513725	0.463203	0.52451	0.414729	0.52451	0.506536
svm, poly	0.596078	0.00961538	0.00490196	0.25	0.00490196	0.990196
svm, poly synthetic samples	0.490196	0.471545	0.568627	0.402778	0.568627	0.437908
svm, poly upsampled	0.515686	0.494888	0.593137	0.424561	0.593137	0.464052
grid, rbf kernel	0.596078	0.0636364	0.0343137	0.4375	0.0343137	0.970588
grid, rbf kernel synthetic samples	0.511765	0.452747	0.504902	0.410359	0.504902	0.51634
grid, rbf kernel upsampled	0.503922	0.469602	0.54902	0.410256	0.54902	0.473856
grid, sigmoid kernel	0.545098	0.32948	0.279412	0.401408	0.279412	0.722222
grid, sigmoid kernel synthetic samples	0.509804	0.470339	0.544118	0.414179	0.544118	0.486928
grid, sigmoid kernel upsampled	0.482353	0.443038	0.514706	0.388889	0.514706	0.460784
random forest estimator	0.564706	0.21831	0.151961	0.3875	0.151961	0.839869
random forest estimator synthetic samples	0.515686	0.404819	0.411765	0.398104	0.411765	0.584967
random forest estimator, upsampled	0.482353	0.501887	0.651961	0.407975	0.651961	0.369281
logistic regression	0.582353	0.273038	0.196078	0.449438	0.196078	0.839869
logistic regression synthetic samples	0.494118	0.436681	0.490196	0.393701	0.490196	0.496732
logistic regression upsampled	0.507843	0.460215	0.52451	0.409962	0.52451	0.496732
knn 10	0.537255	0.309942	0.259804	0.384058	0.259804	0.722222
knn 10 synthetic samples	0.529412	0.491525	0.568627	0.432836	0.568627	0.503268
knn 10 upsampled	0.501961	0.440529	0.490196	0.4	0.490196	0.509804

TABLE CXXXVII: Numerical results of ML methods, using data between time of birth + 4 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.799197	0.888143	0.994987	0.80202	0.994987	0.010101
Logistic regression synthetic samples	0.534137	0.639752	0.516291	0.840816	0.516291	0.606061
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.801205	0.889632	1	0.801205	1	0
svm, linear kernel, synthetic samples	0.453815	0.535836	0.393484	0.839572	0.393484	0.69697
svm, linear kernel upsampled samples	0.491968	0.592593	0.461153	0.828829	0.461153	0.616162
svm, poly	0.799197	0.888393	0.997494	0.800805	0.997494	0
svm, poly synthetic samples	0.447791	0.534687	0.39599	0.822917	0.39599	0.656566
svm, poly upsampled	0.532129	0.637636	0.513784	0.840164	0.513784	0.606061
grid, rbf kernel	0.801205	0.889632	1	0.801205	1	0
grid, rbf kernel synthetic samples	0.461847	0.559211	0.426065	0.813397	0.426065	0.606061
grid, rbf kernel upsampled	0.546185	0.66369	0.558897	0.81685	0.558897	0.494949
grid, sigmoid kernel	0.7751	0.87156	0.952381	0.803383	0.952381	0.0606061
grid, sigmoid kernel synthetic samples	0.538153	0.655689	0.548872	0.814126	0.548872	0.494949
grid, sigmoid kernel upsampled	0.48996	0.600629	0.478697	0.805907	0.478697	0.535354
random forest estimator	0.801205	0.889632	1	0.801205	1	0
random forest estimator synthetic samples	0.666667	0.78934	0.779449	0.799486	0.779449	0.212121
random forest estimator, upsampled	0.748996	0.852768	0.907268	0.804444	0.907268	0.111111
logistic regression	0.795181	0.88565	0.989975	0.801217	0.989975	0.010101
logistic regression synthetic samples	0.534137	0.639752	0.516291	0.840816	0.516291	0.606061
logistic regression upsampled	0.552209	0.664662	0.553885	0.830827	0.553885	0.545455
knn 10	0.7751	0.872727	0.962406	0.798337	0.962406	0.020202
knn 10 synthetic samples	0.435743	0.540098	0.413534	0.778302	0.413534	0.525253
knn 10 upsampled	0.564257	0.679468	0.576441	0.827338	0.576441	0.515152

TABLE CXXXVIII: Numerical results of ML methods, using data between time of birth + 5 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.598394	0.726027	0.898305	0.609195	0.898305	0.162562
Logistic regression synthetic samples	0.576305	0.612844	0.566102	0.668	0.566102	0.591133
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.592369	0.743363	0.99661	0.592742	0.99661	0.00492611
svm, linear kernel, synthetic samples	0.582329	0.625899	0.589831	0.666667	0.589831	0.571429
svm, linear kernel upsampled samples	0.570281	0.64214	0.650847	0.633663	0.650847	0.453202
svm, poly	0.594378	0.744304	0.99661	0.593939	0.99661	0.00985222
svm, poly synthetic samples	0.554217	0.618557	0.610169	0.627178	0.610169	0.472906
svm, poly upsampled	0.550201	0.63871	0.671186	0.609231	0.671186	0.374384
grid, rbf kernel	0.598394	0.738903	0.959322	0.600849	0.959322	0.0738916
grid, rbf kernel synthetic samples	0.546185	0.594982	0.562712	0.631179	0.562712	0.522167
grid, rbf kernel upsampled	0.53012	0.617647	0.640678	0.596215	0.640678	0.369458
grid, sigmoid kernel	0.594378	0.70977	0.837288	0.61596	0.837288	0.241379
grid, sigmoid kernel synthetic samples	0.51004	0.577855	0.566102	0.590106	0.566102	0.428571
grid, sigmoid kernel upsampled	0.52008	0.582897	0.566102	0.600719	0.566102	0.453202
random forest estimator	0.618474	0.743935	0.935593	0.61745	0.935593	0.157635
random forest estimator synthetic samples	0.548193	0.630542	0.650847	0.611465	0.650847	0.399015
random forest estimator, upsampled	0.590361	0.698225	0.8	0.619423	0.8	0.285714
logistic regression	0.594378	0.721763	0.888136	0.607889	0.888136	0.167488
logistic regression synthetic samples	0.576305	0.612844	0.566102	0.668	0.566102	0.591133
logistic regression upsampled	0.542169	0.594306	0.566102	0.625468	0.566102	0.507389
knn 10	0.512048	0.634586	0.715254	0.57027	0.715254	0.216749
knn 10 synthetic samples	0.481928	0.511364	0.457627	0.579399	0.457627	0.517241
knn 10 upsampled	0.522088	0.586806	0.572881	0.601423	0.572881	0.448276

TABLE CXXXIX: Numerical results of ML methods, using data between time of birth + 5 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.596386	0.229885	0.145631	0.545455	0.145631	0.914384
Logistic regression synthetic samples	0.514056	0.473913	0.529126	0.429134	0.529126	0.503425
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.586345	0	0	0	0	1
svm, linear kernel, synthetic samples	0.52008	0.507216	0.597087	0.44086	0.597087	0.465753
svm, linear kernel upsampled samples	0.495984	0.496994	0.601942	0.423208	0.601942	0.421233
svm, poly	0.586345	0.00961538	0.00485437	0.5	0.00485437	0.996575
svm, poly synthetic samples	0.481928	0.520446	0.679612	0.421687	0.679612	0.342466
svm, poly upsampled	0.477912	0.486166	0.597087	0.41	0.597087	0.393836
grid, rbf kernel	0.586345	0.0190476	0.00970874	0.5	0.00970874	0.993151
grid, rbf kernel synthetic samples	0.491968	0.482618	0.572816	0.416961	0.572816	0.434932
grid, rbf kernel upsampled	0.5	0.447894	0.490291	0.412245	0.490291	0.506849
grid, sigmoid kernel	0.560241	0.15444	0.0970874	0.377358	0.0970874	0.886986
grid, sigmoid kernel synthetic samples	0.485944	0.433628	0.475728	0.398374	0.475728	0.493151
grid, sigmoid kernel upsampled	0.463855	0.483559	0.606796	0.401929	0.606796	0.363014
random forest estimator	0.576305	0.232727	0.15534	0.463768	0.15534	0.873288
random forest estimator synthetic samples	0.532129	0.441247	0.446602	0.436019	0.446602	0.592466
random forest estimator, upsampled	0.495984	0.510721	0.635922	0.42671	0.635922	0.39726
logistic regression	0.596386	0.247191	0.160194	0.540984	0.160194	0.90411
logistic regression synthetic samples	0.514056	0.473913	0.529126	0.429134	0.529126	0.503425
logistic regression upsampled	0.47992	0.457023	0.529126	0.402214	0.529126	0.445205
knn 10	0.586345	0.375758	0.300971	0.5	0.300971	0.787671
knn 10 synthetic samples	0.544177	0.480549	0.509709	0.454545	0.509709	0.568493
knn 10 upsampled	0.516064	0.47033	0.519417	0.429719	0.519417	0.513699

TABLE CXL: Numerical results of ML methods, using data between time of birth + 5 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.770961	0.87037	0.992084	0.775258	0.992084	0.00909091
Logistic regression synthetic samples	0.507157	0.613162	0.503958	0.782787	0.503958	0.518182
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.775051	0.873272	1	0.775051	1	0
svm, linear kernel, synthetic samples	0.490798	0.585691	0.46438	0.792793	0.46438	0.581818
svm, linear kernel upsampled samples	0.501022	0.607717	0.498681	0.777778	0.498681	0.509091
svm, poly	0.775051	0.873272	1	0.775051	1	0
svm, poly synthetic samples	0.488753	0.576271	0.448549	0.805687	0.448549	0.627273
svm, poly upsampled	0.527607	0.635071	0.530343	0.791339	0.530343	0.518182
grid, rbf kernel	0.775051	0.873272	1	0.775051	1	0
grid, rbf kernel synthetic samples	0.484663	0.586885	0.472296	0.774892	0.472296	0.527273
grid, rbf kernel upsampled	0.640082	0.754875	0.71504	0.79941	0.71504	0.381818
grid, sigmoid kernel	0.770961	0.869159	0.98153	0.779874	0.98153	0.0454545
grid, sigmoid kernel synthetic samples	0.529652	0.639498	0.538259	0.787645	0.538259	0.5
grid, sigmoid kernel upsampled	0.515337	0.630265	0.532982	0.770992	0.532982	0.454545
random forest estimator	0.775051	0.873272	1	0.775051	1	0
random forest estimator synthetic samples	0.697342	0.804749	0.804749	0.804749	0.804749	0.327273
random forest estimator, upsampled	0.750511	0.852657	0.931398	0.786192	0.931398	0.127273
logistic regression	0.770961	0.87037	0.992084	0.775258	0.992084	0.00909091
logistic regression synthetic samples	0.507157	0.613162	0.503958	0.782787	0.503958	0.518182
logistic regression upsampled	0.523517	0.628389	0.519789	0.794355	0.519789	0.536364
knn 10	0.770961	0.87007	0.989446	0.776398	0.989446	0.0181818
knn 10 synthetic samples	0.505112	0.608414	0.496042	0.786611	0.496042	0.536364
knn 10 upsampled	0.531697	0.651446	0.564644	0.769784	0.564644	0.418182

TABLE CXLI: Numerical results of ML methods, using data between time of birth + 6 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.627812	0.752044	0.916944	0.637413	0.916944	0.164894
Logistic regression synthetic samples	0.556237	0.607595	0.55814	0.666667	0.55814	0.553191
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613497	0.760456	0.996678	0.614754	0.996678	0
svm, linear kernel, synthetic samples	0.543967	0.58473	0.521595	0.665254	0.521595	0.579787
svm, linear kernel upsampled samples	0.599182	0.681818	0.697674	0.666667	0.697674	0.441489
svm, poly	0.609407	0.756066	0.983389	0.614108	0.983389	0.0106383
svm, poly synthetic samples	0.558282	0.626298	0.601329	0.65343	0.601329	0.489362
svm, poly upsampled	0.607362	0.708207	0.774086	0.652661	0.774086	0.340426
grid, rbf kernel	0.613497	0.757381	0.980066	0.617155	0.980066	0.0265957
grid, rbf kernel synthetic samples	0.570552	0.64527	0.634551	0.656357	0.634551	0.468085
grid, rbf kernel upsampled	0.572597	0.681887	0.744186	0.629213	0.744186	0.297872
grid, sigmoid kernel	0.609407	0.739427	0.900332	0.627315	0.900332	0.143617
grid, sigmoid kernel synthetic samples	0.521472	0.60339	0.591362	0.615917	0.591362	0.409574
grid, sigmoid kernel upsampled	0.523517	0.607083	0.598007	0.616438	0.598007	0.404255
random forest estimator	0.607362	0.73842	0.900332	0.625866	0.900332	0.138298
random forest estimator synthetic samples	0.562372	0.651466	0.664452	0.638978	0.664452	0.398936
random forest estimator, upsampled	0.607362	0.715134	0.800664	0.646113	0.800664	0.297872
logistic regression	0.625767	0.747586	0.900332	0.639151	0.900332	0.18617
logistic regression synthetic samples	0.556237	0.607595	0.55814	0.666667	0.55814	0.553191
logistic regression upsampled	0.609407	0.673504	0.654485	0.693662	0.654485	0.537234
knn 10	0.586912	0.693009	0.757475	0.638655	0.757475	0.31383
knn 10 synthetic samples	0.496933	0.528736	0.458472	0.624434	0.458472	0.558511
knn 10 upsampled	0.509202	0.581882	0.554817	0.611722	0.554817	0.43617

TABLE CXLII: Numerical results of ML methods, using data between time of birth + 6 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.560327	0.122449	0.0738916	0.357143	0.0738916	0.905594
Logistic regression synthetic samples	0.507157	0.404938	0.403941	0.405941	0.403941	0.58042
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.584867	0	0	0	0	1
svm, linear kernel, synthetic samples	0.511247	0.421308	0.428571	0.414286	0.428571	0.56993
svm, linear kernel upsampled samples	0.543967	0.429668	0.413793	0.446809	0.413793	0.636364
svm, poly	0.582822	0	0	0	0	0.996503
svm, poly synthetic samples	0.498978	0.488518	0.576355	0.423913	0.576355	0.444056
svm, poly upsampled	0.523517	0.456876	0.482759	0.433628	0.482759	0.552448
grid, rbf kernel	0.582822	0	0	0	0	0.996503
grid, rbf kernel synthetic samples	0.505112	0.493724	0.581281	0.429091	0.581281	0.451049
grid, rbf kernel upsampled	0.552147	0.47482	0.487685	0.462617	0.487685	0.597902
grid, sigmoid kernel	0.574642	0.140496	0.0837438	0.435897	0.0837438	0.923077
grid, sigmoid kernel synthetic samples	0.511247	0.477024	0.536946	0.429134	0.536946	0.493007
grid, sigmoid kernel upsampled	0.513292	0.47807	0.536946	0.43083	0.536946	0.496503
random forest estimator	0.554192	0.148437	0.0935961	0.358491	0.0935961	0.881119
random forest estimator synthetic samples	0.529652	0.407216	0.389163	0.427027	0.389163	0.629371
random forest estimator, upsampled	0.496933	0.517647	0.650246	0.429967	0.650246	0.388112
logistic regression	0.554192	0.134921	0.0837438	0.346939	0.0837438	0.888112
logistic regression synthetic samples	0.507157	0.404938	0.403941	0.405941	0.403941	0.58042
logistic regression upsampled	0.529652	0.444444	0.453202	0.436019	0.453202	0.583916
knn 10	0.543967	0.309598	0.246305	0.416667	0.246305	0.755245
knn 10 synthetic samples	0.498978	0.454343	0.502463	0.414634	0.502463	0.496503
knn 10 upsampled	0.523517	0.443914	0.458128	0.430556	0.458128	0.56993

TABLE CXLIII: Numerical results of ML methods, using data between time of birth + 6 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.783333	0.87822	0.989446	0.789474	0.989446	0.00990099
Logistic regression synthetic samples	0.545833	0.652866	0.540897	0.823293	0.540897	0.564356
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.789583	0.882421	1	0.789583	1	0
svm, linear kernel, synthetic samples	0.479167	0.570447	0.437995	0.817734	0.437995	0.633663
svm, linear kernel upsampled samples	0.602083	0.713643	0.627968	0.826389	0.627968	0.50495
svm, poly	0.7875	0.881119	0.997361	0.789144	0.997361	0
svm, poly synthetic samples	0.495833	0.59396	0.467018	0.815668	0.467018	0.60396
svm, poly upsampled	0.597917	0.715758	0.641161	0.81	0.641161	0.435644
grid, rbf kernel	0.789583	0.882421	1	0.789583	1	0
grid, rbf kernel synthetic samples	0.491667	0.603896	0.490765	0.78481	0.490765	0.49505
grid, rbf kernel upsampled	0.602083	0.72198	0.654354	0.805195	0.654354	0.405941
grid, sigmoid kernel	0.7625	0.863636	0.952507	0.789934	0.952507	0.049505
grid, sigmoid kernel synthetic samples	0.516667	0.624595	0.509235	0.807531	0.509235	0.544554
grid, sigmoid kernel upsampled	0.514583	0.630745	0.525066	0.789683	0.525066	0.475248
random forest estimator	0.789583	0.882421	1	0.789583	1	0
random forest estimator synthetic samples	0.695833	0.807388	0.807388	0.807388	0.807388	0.277228
random forest estimator, upsampled	0.747917	0.851534	0.915567	0.795872	0.915567	0.118812
logistic regression	0.783333	0.87822	0.989446	0.789474	0.989446	0.00990099
logistic regression synthetic samples	0.545833	0.652866	0.540897	0.823293	0.540897	0.564356
logistic regression upsampled	0.585417	0.693374	0.593668	0.833333	0.593668	0.554455
knn 10	0.76875	0.868014	0.963061	0.790043	0.963061	0.039604
knn 10 synthetic samples	0.529167	0.64127	0.532982	0.804781	0.532982	0.514851
knn 10 upsampled	0.560417	0.679818	0.591029	0.8	0.591029	0.445545

TABLE CXLIV: Numerical results of ML methods, using data between time of birth + 7 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.583333	0.730458	0.960993	0.58913	0.960993	0.0454545
Logistic regression synthetic samples	0.508333	0.551331	0.514184	0.594262	0.514184	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.5875	0.740157	1	0.5875	1	0
svm, linear kernel, synthetic samples	0.5	0.504132	0.432624	0.60396	0.432624	0.59596
svm, linear kernel upsampled samples	0.50625	0.553672	0.521277	0.590361	0.521277	0.484848
svm, poly	0.585417	0.737813	0.992908	0.587002	0.992908	0.00505051
svm, poly synthetic samples	0.464583	0.463466	0.393617	0.563452	0.393617	0.565657
svm, poly upsampled	0.464583	0.489066	0.43617	0.556561	0.43617	0.505051
grid, rbf kernel	0.591667	0.741425	0.996454	0.590336	0.996454	0.0151515
grid, rbf kernel synthetic samples	0.4625	0.457983	0.386525	0.561856	0.386525	0.570707
grid, rbf kernel upsampled	0.491667	0.504065	0.439716	0.590476	0.439716	0.565657
grid, sigmoid kernel	0.58125	0.721992	0.925532	0.591837	0.925532	0.0909091
grid, sigmoid kernel synthetic samples	0.491667	0.556364	0.542553	0.570896	0.542553	0.419192
grid, sigmoid kernel upsampled	0.475	0.529851	0.503546	0.559055	0.503546	0.434343
random forest estimator	0.579167	0.720994	0.925532	0.590498	0.925532	0.0858586
random forest estimator synthetic samples	0.5125	0.590909	0.599291	0.582759	0.599291	0.388889
random forest estimator, upsampled	0.5625	0.675926	0.776596	0.598361	0.776596	0.257576
logistic regression	0.59375	0.736842	0.968085	0.594771	0.968085	0.0606061
logistic regression synthetic samples	0.508333	0.551331	0.514184	0.594262	0.514184	0.5
logistic regression upsampled	0.510417	0.564007	0.539007	0.59144	0.539007	0.469697
knn 10	0.54375	0.646204	0.70922	0.593472	0.70922	0.308081
knn 10 synthetic samples	0.447917	0.444444	0.375887	0.54359	0.375887	0.550505
knn 10 upsampled	0.48125	0.51272	0.464539	0.572052	0.464539	0.505051

TABLE CXLV: Numerical results of ML methods, using data between time of birth + 7 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.610417	0.230453	0.153005	0.466667	0.153005	0.892256
Logistic regression synthetic samples	0.508333	0.463636	0.557377	0.396887	0.557377	0.478114
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.61875	0	0	0	0	1
svm, linear kernel, synthetic samples	0.483333	0.476793	0.617486	0.388316	0.617486	0.400673
svm, linear kernel upsampled samples	0.495833	0.502058	0.666667	0.40264	0.666667	0.390572
svm, poly	0.610417	0	0	0	0	0.986532
svm, poly synthetic samples	0.479167	0.49187	0.661202	0.391586	0.661202	0.367003
svm, poly upsampled	0.485417	0.518519	0.726776	0.40303	0.726776	0.3367
grid, rbf kernel	0.614583	0.0314136	0.0163934	0.375	0.0163934	0.983165
grid, rbf kernel synthetic samples	0.529167	0.474419	0.557377	0.412955	0.557377	0.511785
grid, rbf kernel upsampled	0.525	0.462264	0.535519	0.406639	0.535519	0.518519
grid, sigmoid kernel	0.575	0.296552	0.234973	0.401869	0.234973	0.784512
grid, sigmoid kernel synthetic samples	0.508333	0.401015	0.431694	0.374408	0.431694	0.555556
grid, sigmoid kernel upsampled	0.483333	0.524904	0.748634	0.40413	0.748634	0.319865
random forest estimator	0.577083	0.191235	0.131148	0.352941	0.131148	0.851852
random forest estimator synthetic samples	0.516667	0.359116	0.355191	0.363128	0.355191	0.616162
random forest estimator, upsampled	0.495833	0.482906	0.617486	0.396491	0.617486	0.420875
logistic regression	0.6125	0.25	0.169399	0.476923	0.169399	0.885522
logistic regression synthetic samples	0.508333	0.463636	0.557377	0.396887	0.557377	0.478114
logistic regression upsampled	0.516667	0.484444	0.595628	0.40824	0.595628	0.468013
knn 10	0.547917	0.297735	0.251366	0.365079	0.251366	0.73064
knn 10 synthetic samples	0.525	0.432836	0.47541	0.39726	0.47541	0.555556
knn 10 upsampled	0.520833	0.430693	0.47541	0.393665	0.47541	0.548822

TABLE CXLVI: Numerical results of ML methods, using data between time of birth + 7 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.780384	0.876647	0.997275	0.782051	0.997275	0
Logistic regression synthetic samples	0.530917	0.630872	0.512262	0.820961	0.512262	0.598039
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.782516	0.87799	1	0.782516	1	0
svm, linear kernel, synthetic samples	0.477612	0.561717	0.427793	0.817708	0.427793	0.656863
svm, linear kernel upsampled samples	0.513859	0.622517	0.512262	0.793249	0.512262	0.519608
svm, poly	0.780384	0.876647	0.997275	0.782051	0.997275	0
svm, poly synthetic samples	0.473348	0.562832	0.433243	0.80303	0.433243	0.617647
svm, poly upsampled	0.550107	0.666667	0.574932	0.793233	0.574932	0.460784
grid, rbf kernel	0.782516	0.87799	1	0.782516	1	0
grid, rbf kernel synthetic samples	0.503198	0.612313	0.501362	0.786325	0.501362	0.509804
grid, rbf kernel upsampled	0.605544	0.725111	0.66485	0.797386	0.66485	0.392157
grid, sigmoid kernel	0.75693	0.861314	0.964578	0.778022	0.964578	0.00980392
grid, sigmoid kernel synthetic samples	0.511727	0.643857	0.564033	0.75	0.564033	0.323529
grid, sigmoid kernel upsampled	0.496802	0.605351	0.493188	0.78355	0.493188	0.509804
random forest estimator	0.782516	0.87799	1	0.782516	1	0
random forest estimator synthetic samples	0.675906	0.790634	0.782016	0.799443	0.782016	0.294118
random forest estimator, upsampled	0.731343	0.84131	0.910082	0.782201	0.910082	0.0882353
logistic regression	0.780384	0.876647	0.997275	0.782051	0.997275	0
logistic regression synthetic samples	0.530917	0.630872	0.512262	0.820961	0.512262	0.598039
logistic regression upsampled	0.535181	0.646104	0.542234	0.799197	0.542234	0.509804
knn 10	0.776119	0.873341	0.986376	0.78355	0.986376	0.0196078
knn 10 synthetic samples	0.49467	0.608264	0.501362	0.773109	0.501362	0.470588
knn 10 upsampled	0.558635	0.687783	0.621253	0.77027	0.621253	0.333333

TABLE CXLVII: Numerical results of ML methods, using data between time of birth + 8 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.605544	0.733813	0.891608	0.623472	0.891608	0.15847
Logistic regression synthetic samples	0.513859	0.563218	0.513986	0.622881	0.513986	0.513661
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.609808	0.757616	1	0.609808	1	0
svm, linear kernel, synthetic samples	0.530917	0.568627	0.506993	0.647321	0.506993	0.568306
svm, linear kernel upsampled samples	0.54371	0.621908	0.615385	0.628571	0.615385	0.431694
svm, poly	0.61194	0.757979	0.996503	0.611588	0.996503	0.010929
svm, poly synthetic samples	0.522388	0.557312	0.493007	0.640909	0.493007	0.568306
svm, poly upsampled	0.530917	0.623288	0.636364	0.610738	0.636364	0.36612
grid, rbf kernel	0.609808	0.753036	0.975524	0.613187	0.975524	0.0382514
grid, rbf kernel synthetic samples	0.513859	0.559846	0.506993	0.625	0.506993	0.52459
grid, rbf kernel upsampled	0.539446	0.626298	0.632867	0.619863	0.632867	0.393443
grid, sigmoid kernel	0.571429	0.7157	0.884615	0.60095	0.884615	0.0819672
grid, sigmoid kernel synthetic samples	0.526652	0.561265	0.496503	0.645455	0.496503	0.57377
grid, sigmoid kernel upsampled	0.539446	0.607273	0.583916	0.632576	0.583916	0.469945
random forest estimator	0.599147	0.735955	0.916084	0.615023	0.916084	0.103825
random forest estimator synthetic samples	0.522388	0.611111	0.615385	0.606897	0.615385	0.377049
random forest estimator, upsampled	0.533049	0.658346	0.737762	0.594366	0.737762	0.213115
logistic regression	0.601279	0.728592	0.877622	0.622829	0.877622	0.169399
logistic regression synthetic samples	0.513859	0.563218	0.513986	0.622881	0.513986	0.513661
logistic regression upsampled	0.513859	0.568182	0.524476	0.619835	0.524476	0.497268
knn 10	0.556503	0.671924	0.744755	0.612069	0.744755	0.262295
knn 10 synthetic samples	0.518124	0.55336	0.48951	0.636364	0.48951	0.562842
knn 10 upsampled	0.520256	0.568138	0.517483	0.629787	0.517483	0.52459

TABLE CXLVIII: Numerical results of ML methods, using data between time of birth + 8 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.58209	0.196721	0.126984	0.436364	0.126984	0.889286
Logistic regression synthetic samples	0.526652	0.471429	0.52381	0.428571	0.52381	0.528571
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.592751	0	0	0	0	0.992857
svm, linear kernel, synthetic samples	0.515991	0.460808	0.513228	0.418103	0.513228	0.517857
svm, linear kernel upsampled samples	0.501066	0.41791	0.444444	0.394366	0.444444	0.539286
svm, poly	0.597015	0.0307692	0.015873	0.5	0.015873	0.989286
svm, poly synthetic samples	0.511727	0.523909	0.666667	0.431507	0.666667	0.407143
svm, poly upsampled	0.496802	0.40404	0.42328	0.386473	0.42328	0.546429
grid, rbf kernel	0.594883	0	0	0	0	0.996429
grid, rbf kernel synthetic samples	0.484009	0.471616	0.571429	0.401487	0.571429	0.425
grid, rbf kernel upsampled	0.462687	0.442478	0.529101	0.380228	0.529101	0.417857
grid, sigmoid kernel	0.594883	0.0776699	0.042328	0.470588	0.042328	0.967857
grid, sigmoid kernel synthetic samples	0.490405	0.418491	0.455026	0.387387	0.455026	0.514286
grid, sigmoid kernel upsampled	0.535181	0.457711	0.486772	0.431925	0.486772	0.567857
random forest estimator	0.554371	0.110638	0.0687831	0.282609	0.0687831	0.882143
random forest estimator synthetic samples	0.47548	0.342246	0.338624	0.345946	0.338624	0.567857
random forest estimator, upsampled	0.466951	0.465812	0.57672	0.390681	0.57672	0.392857
logistic regression	0.579957	0.221344	0.148148	0.4375	0.148148	0.871429
logistic regression synthetic samples	0.526652	0.471429	0.52381	0.428571	0.52381	0.528571
logistic regression upsampled	0.507463	0.451306	0.502646	0.409483	0.502646	0.510714
knn 10	0.535181	0.35503	0.31746	0.402685	0.31746	0.682143
knn 10 synthetic samples	0.518124	0.493274	0.582011	0.428016	0.582011	0.475
knn 10 upsampled	0.492537	0.463964	0.544974	0.403922	0.544974	0.457143

TABLE CXLIX: Numerical results of ML methods, using data between time of birth + 8 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.784783	0.879415	0.99449	0.78821	0.99449	0
Logistic regression synthetic samples	0.508696	0.620805	0.509642	0.793991	0.509642	0.505155
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.78913	0.882139	1	0.78913	1	0
svm, linear kernel, synthetic samples	0.456522	0.547101	0.415978	0.798942	0.415978	0.608247
svm, linear kernel upsampled samples	0.504348	0.602787	0.476584	0.819905	0.476584	0.608247
svm, poly	0.78913	0.882139	1	0.78913	1	0
svm, poly synthetic samples	0.467391	0.564831	0.438017	0.795	0.438017	0.57732
svm, poly upsampled	0.55	0.655574	0.5427	0.827731	0.5427	0.57732
grid, rbf kernel	0.78913	0.882139	1	0.78913	1	0
grid, rbf kernel synthetic samples	0.46087	0.557143	0.429752	0.791878	0.429752	0.57732
grid, rbf kernel upsampled	0.530435	0.64	0.528926	0.810127	0.528926	0.536082
grid, sigmoid kernel	0.767391	0.866083	0.953168	0.793578	0.953168	0.0721649
grid, sigmoid kernel synthetic samples	0.571739	0.690738	0.606061	0.80292	0.606061	0.443299
grid, sigmoid kernel upsampled	0.563043	0.683465	0.597796	0.797794	0.597796	0.43299
random forest estimator	0.78913	0.882139	1	0.78913	1	0
random forest estimator synthetic samples	0.656522	0.778711	0.76584	0.792023	0.76584	0.247423
random forest estimator, upsampled	0.736957	0.843467	0.898072	0.795122	0.898072	0.134021
logistic regression	0.784783	0.879415	0.99449	0.78821	0.99449	0
logistic regression synthetic samples	0.508696	0.620805	0.509642	0.793991	0.509642	0.505155
logistic regression upsampled	0.554348	0.663383	0.556474	0.821138	0.556474	0.546392
knn 10	0.780435	0.876074	0.983471	0.789823	0.983471	0.0206186
knn 10 synthetic samples	0.458696	0.57725	0.46832	0.752212	0.46832	0.42268
knn 10 upsampled	0.51087	0.637681	0.545455	0.767442	0.545455	0.381443

TABLE CL: Numerical results of ML methods, using data between time of birth + 9 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.617391	0.751412	0.939929	0.625882	0.939929	0.101695
Logistic regression synthetic samples	0.536957	0.595825	0.55477	0.643443	0.55477	0.508475
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613043	0.760108	0.996466	0.614379	0.996466	0
svm, linear kernel, synthetic samples	0.517391	0.564706	0.508834	0.634361	0.508834	0.531073
svm, linear kernel upsampled samples	0.523913	0.579655	0.533569	0.634454	0.533569	0.508475
svm, poly	0.608696	0.756098	0.985866	0.613187	0.985866	0.00564972
svm, poly synthetic samples	0.530435	0.598513	0.568905	0.631373	0.568905	0.468927
svm, poly upsampled	0.530435	0.621053	0.625442	0.616725	0.625442	0.378531
grid, rbf kernel	0.61087	0.757781	0.989399	0.614035	0.989399	0.00564972
grid, rbf kernel synthetic samples	0.536957	0.600375	0.565371	0.64	0.565371	0.491525
grid, rbf kernel upsampled	0.580435	0.670085	0.69258	0.649007	0.69258	0.40113
grid, sigmoid kernel	0.593478	0.732475	0.904594	0.615385	0.904594	0.0960452
grid, sigmoid kernel synthetic samples	0.491304	0.56015	0.526502	0.598394	0.526502	0.435028
grid, sigmoid kernel upsampled	0.493478	0.549323	0.501767	0.606838	0.501767	0.480226
random forest estimator	0.621739	0.752137	0.932862	0.630072	0.932862	0.124294
random forest estimator synthetic samples	0.586957	0.667832	0.674912	0.6609	0.674912	0.446328
random forest estimator, upsampled	0.615217	0.72126	0.809187	0.650568	0.809187	0.305085
logistic regression	0.61087	0.747532	0.936396	0.622066	0.936396	0.0903955
logistic regression synthetic samples	0.536957	0.595825	0.55477	0.643443	0.55477	0.508475
logistic regression upsampled	0.55	0.627027	0.614841	0.639706	0.614841	0.446328
knn 10	0.565217	0.684543	0.766784	0.618234	0.766784	0.242938
knn 10 synthetic samples	0.515217	0.553106	0.487633	0.638889	0.487633	0.559322
knn 10 upsampled	0.517391	0.577947	0.537102	0.625514	0.537102	0.485876

TABLE CLI: Numerical results of ML methods, using data between time of birth + 9 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.58913	0.181818	0.11413	0.446809	0.11413	0.905797
Logistic regression synthetic samples	0.528261	0.494172	0.576087	0.432653	0.576087	0.496377
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.602174	0.0108108	0.00543478	1	0.00543478	1
svm, linear kernel, synthetic samples	0.495652	0.518672	0.679348	0.419463	0.679348	0.373188
svm, linear kernel upsampled samples	0.536957	0.496454	0.570652	0.439331	0.570652	0.514493
svm, poly	0.606522	0.042328	0.0217391	0.8	0.0217391	0.996377
svm, poly synthetic samples	0.473913	0.512097	0.690217	0.407051	0.690217	0.32971
svm, poly upsampled	0.5	0.512712	0.657609	0.420139	0.657609	0.394928
grid, rbf kernel	0.591304	0.0309278	0.0163043	0.3	0.0163043	0.974638
grid, rbf kernel synthetic samples	0.456522	0.451754	0.559783	0.378676	0.559783	0.387681
grid, rbf kernel upsampled	0.465217	0.474359	0.603261	0.390845	0.603261	0.373188
grid, sigmoid kernel	0.571739	0.303887	0.233696	0.434343	0.233696	0.797101
grid, sigmoid kernel synthetic samples	0.471739	0.414458	0.467391	0.372294	0.467391	0.474638
grid, sigmoid kernel upsampled	0.484783	0.4859	0.608696	0.404332	0.608696	0.402174
random forest estimator	0.586957	0.257812	0.179348	0.458333	0.179348	0.858696
random forest estimator synthetic samples	0.543478	0.447368	0.461957	0.433673	0.461957	0.597826
random forest estimator, upsampled	0.513043	0.527426	0.679348	0.431034	0.679348	0.402174
logistic regression	0.571739	0.202429	0.13587	0.396825	0.13587	0.862319
logistic regression synthetic samples	0.528261	0.494172	0.576087	0.432653	0.576087	0.496377
logistic regression upsampled	0.532609	0.498834	0.581522	0.436735	0.581522	0.5
knn 10	0.56087	0.412791	0.38587	0.44375	0.38587	0.677536
knn 10 synthetic samples	0.519565	0.520607	0.652174	0.433213	0.652174	0.431159
knn 10 upsampled	0.530435	0.492958	0.570652	0.433884	0.570652	0.503623

TABLE CLII: Numerical results of ML methods, using data between time of birth + 9 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.801325	0.889706	1	0.801325	1	0
Logistic regression synthetic samples	0.536424	0.652318	0.5427	0.817427	0.5427	0.511111
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.799117	0.888344	0.997245	0.800885	0.997245	0
svm, linear kernel, synthetic samples	0.503311	0.60733	0.479339	0.828571	0.479339	0.6
svm, linear kernel upsampled samples	0.483444	0.588028	0.460055	0.814634	0.460055	0.577778
svm, poly	0.801325	0.889706	1	0.801325	1	0
svm, poly synthetic samples	0.501104	0.606272	0.479339	0.824645	0.479339	0.588889
svm, poly upsampled	0.523179	0.64	0.528926	0.810127	0.528926	0.5
grid, rbf kernel	0.801325	0.889706	1	0.801325	1	0
grid, rbf kernel synthetic samples	0.523179	0.635135	0.517906	0.820961	0.517906	0.544444
grid, rbf kernel upsampled	0.578366	0.704791	0.628099	0.802817	0.628099	0.377778
grid, sigmoid kernel	0.774834	0.872818	0.964187	0.797267	0.964187	0.0111111
grid, sigmoid kernel synthetic samples	0.527594	0.657051	0.564738	0.785441	0.564738	0.377778
grid, sigmoid kernel upsampled	0.536424	0.656863	0.553719	0.807229	0.553719	0.466667
random forest estimator	0.801325	0.889706	1	0.801325	1	0
random forest estimator synthetic samples	0.677704	0.790831	0.760331	0.823881	0.760331	0.344444
random forest estimator, upsampled	0.754967	0.856404	0.911846	0.807317	0.911846	0.122222
logistic regression	0.796909	0.886978	0.99449	0.800443	0.99449	0
logistic regression synthetic samples	0.536424	0.652318	0.5427	0.817427	0.5427	0.511111
logistic regression upsampled	0.543046	0.657851	0.548209	0.822314	0.548209	0.522222
knn 10	0.794702	0.884758	0.983471	0.804054	0.983471	0.0333333
knn 10 synthetic samples	0.560706	0.673235	0.564738	0.833333	0.564738	0.544444
knn 10 upsampled	0.584989	0.707165	0.625344	0.81362	0.625344	0.422222

TABLE CLIII: Numerical results of ML methods, using data between time of birth + 10 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.615894	0.745614	0.917266	0.628079	0.917266	0.137143
Logistic regression synthetic samples	0.516556	0.564612	0.510791	0.631111	0.510791	0.525714
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613687	0.760602	1	0.613687	1	0
svm, linear kernel, synthetic samples	0.472406	0.496842	0.42446	0.598985	0.42446	0.548571
svm, linear kernel upsampled samples	0.536424	0.58	0.521583	0.653153	0.521583	0.56
svm, poly	0.609272	0.757202	0.992806	0.611973	0.992806	0
svm, poly synthetic samples	0.490066	0.505353	0.42446	0.624339	0.42446	0.594286
svm, poly upsampled	0.507726	0.558416	0.507194	0.621145	0.507194	0.508571
grid, rbf kernel	0.611479	0.758242	0.992806	0.613333	0.992806	0.00571429
grid, rbf kernel synthetic samples	0.487859	0.530364	0.471223	0.606481	0.471223	0.514286
grid, rbf kernel upsampled	0.543046	0.631016	0.636691	0.625442	0.636691	0.394286
grid, sigmoid kernel	0.569536	0.703196	0.830935	0.609499	0.830935	0.154286
grid, sigmoid kernel synthetic samples	0.512141	0.572534	0.532374	0.619247	0.532374	0.48
grid, sigmoid kernel upsampled	0.481236	0.555766	0.528777	0.585657	0.528777	0.405714
random forest estimator	0.613687	0.743025	0.910072	0.627792	0.910072	0.142857
random forest estimator synthetic samples	0.540839	0.61194	0.589928	0.635659	0.589928	0.462857
random forest estimator, upsampled	0.576159	0.675676	0.719424	0.636943	0.719424	0.348571
logistic regression	0.622517	0.746667	0.906475	0.634761	0.906475	0.171429
logistic regression synthetic samples	0.516556	0.564612	0.510791	0.631111	0.510791	0.525714
logistic regression upsampled	0.527594	0.57874	0.528777	0.63913	0.528777	0.525714
knn 10	0.580574	0.702194	0.805755	0.622222	0.805755	0.222857
knn 10 synthetic samples	0.538631	0.590998	0.543165	0.648069	0.543165	0.531429
knn 10 upsampled	0.534216	0.608534	0.589928	0.628352	0.589928	0.445714

TABLE CLIV: Numerical results of ML methods, using data between time of birth + 10 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.593819	0.148148	0.0888889	0.444444	0.0888889	0.92674
Logistic regression synthetic samples	0.505519	0.461538	0.533333	0.40678	0.533333	0.487179
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.602649	0.010989	0.00555556	0.5	0.00555556	0.996337
svm, linear kernel, synthetic samples	0.496689	0.495575	0.622222	0.411765	0.622222	0.413919
svm, linear kernel upsampled samples	0.481236	0.469526	0.577778	0.395437	0.577778	0.417582
svm, poly	0.602649	0.0217391	0.0111111	0.5	0.0111111	0.992674
svm, poly synthetic samples	0.483444	0.502128	0.655556	0.406897	0.655556	0.369963
svm, poly upsampled	0.470199	0.42029	0.483333	0.371795	0.483333	0.461538
grid, rbf kernel	0.602649	0	0	0	0	1
grid, rbf kernel synthetic samples	0.501104	0.456731	0.527778	0.402542	0.527778	0.483516
grid, rbf kernel upsampled	0.483444	0.370968	0.383333	0.359375	0.383333	0.549451
grid, sigmoid kernel	0.556291	0.165975	0.111111	0.327869	0.111111	0.849817
grid, sigmoid kernel synthetic samples	0.503311	0.514039	0.661111	0.420495	0.661111	0.399267
grid, sigmoid kernel upsampled	0.423841	0.408163	0.5	0.344828	0.5	0.373626
random forest estimator	0.604857	0.244726	0.161111	0.508772	0.161111	0.897436
random forest estimator synthetic samples	0.520971	0.395543	0.394444	0.396648	0.394444	0.604396
random forest estimator, upsampled	0.494481	0.5054	0.65	0.413428	0.65	0.391941
logistic regression	0.582781	0.167401	0.105556	0.404255	0.105556	0.897436
logistic regression synthetic samples	0.505519	0.461538	0.533333	0.40678	0.533333	0.487179
logistic regression upsampled	0.483444	0.468182	0.572222	0.396154	0.572222	0.424908
knn 10	0.547461	0.438356	0.444444	0.432432	0.444444	0.615385
knn 10 synthetic samples	0.483444	0.5	0.65	0.40625	0.65	0.373626
knn 10 upsampled	0.481236	0.464692	0.566667	0.393822	0.566667	0.424908

TABLE CLV: Numerical results of ML methods, using data between time of birth + 10 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.757303	0.861893	0.997041	0.759009	0.997041	0
Logistic regression synthetic samples	0.573034	0.67128	0.573964	0.808333	0.573964	0.570093
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.759551	0.863346	1	0.759551	1	0
svm, linear kernel, synthetic samples	0.548315	0.629834	0.505917	0.834146	0.505917	0.682243
svm, linear kernel upsampled samples	0.496629	0.575758	0.449704	0.8	0.449704	0.64486
svm, poly	0.757303	0.861893	0.997041	0.759009	0.997041	0
svm, poly synthetic samples	0.546067	0.641844	0.535503	0.800885	0.535503	0.579439
svm, poly upsampled	0.548315	0.654045	0.56213	0.781893	0.56213	0.504673
grid, rbf kernel	0.759551	0.863346	1	0.759551	1	0
grid, rbf kernel synthetic samples	0.546067	0.65411	0.565089	0.776423	0.565089	0.485981
grid, rbf kernel upsampled	0.586517	0.710692	0.668639	0.758389	0.668639	0.327103
grid, sigmoid kernel	0.74382	0.851948	0.970414	0.759259	0.970414	0.0280374
grid, sigmoid kernel synthetic samples	0.58427	0.690117	0.609467	0.795367	0.609467	0.504673
grid, sigmoid kernel upsampled	0.575281	0.686567	0.612426	0.781132	0.612426	0.457944
random forest estimator	0.759551	0.863346	1	0.759551	1	0
random forest estimator synthetic samples	0.658427	0.777126	0.784024	0.770349	0.784024	0.261682
random forest estimator, upsampled	0.714607	0.829071	0.911243	0.760494	0.911243	0.0934579
logistic regression	0.759551	0.862996	0.997041	0.760722	0.997041	0.00934579
logistic regression synthetic samples	0.573034	0.67128	0.573964	0.808333	0.573964	0.570093
logistic regression upsampled	0.575281	0.669002	0.565089	0.819742	0.565089	0.607477
knn 10	0.739326	0.849351	0.967456	0.756944	0.967456	0.0186916
knn 10 synthetic samples	0.548315	0.654045	0.56213	0.781893	0.56213	0.504673
knn 10 upsampled	0.546067	0.663333	0.588757	0.759542	0.588757	0.411215

TABLE CLVI: Numerical results of ML methods, using data between time of birth + 11 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.579775	0.71964	0.916031	0.592593	0.916031	0.0983607
Logistic regression synthetic samples	0.595506	0.641434	0.614504	0.670833	0.614504	0.568306
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.586517	0.739377	0.996183	0.587838	0.996183	0
svm, linear kernel, synthetic samples	0.566292	0.605317	0.564885	0.651982	0.564885	0.568306
svm, linear kernel upsampled samples	0.561798	0.604462	0.568702	0.645022	0.568702	0.551913
svm, poly	0.582022	0.733524	0.977099	0.587156	0.977099	0.0163934
svm, poly synthetic samples	0.537079	0.59127	0.568702	0.615702	0.568702	0.491803
svm, poly upsampled	0.564045	0.629771	0.629771	0.629771	0.629771	0.469945
grid, rbf kernel	0.577528	0.722714	0.935115	0.588942	0.935115	0.0655738
grid, rbf kernel synthetic samples	0.507865	0.555781	0.522901	0.593074	0.522901	0.486339
grid, rbf kernel upsampled	0.557303	0.633147	0.648855	0.618182	0.648855	0.42623
grid, sigmoid kernel	0.579775	0.706436	0.858779	0.6	0.858779	0.180328
grid, sigmoid kernel synthetic samples	0.51236	0.558045	0.522901	0.598253	0.522901	0.497268
grid, sigmoid kernel upsampled	0.537079	0.577869	0.538168	0.623894	0.538168	0.535519
random forest estimator	0.58427	0.722639	0.919847	0.595062	0.919847	0.103825
random forest estimator synthetic samples	0.548315	0.624299	0.637405	0.611722	0.637405	0.420765
random forest estimator, upsampled	0.575281	0.688633	0.79771	0.605797	0.79771	0.256831
logistic regression	0.582022	0.719033	0.908397	0.595	0.908397	0.114754
logistic regression synthetic samples	0.595506	0.641434	0.614504	0.670833	0.614504	0.568306
logistic regression upsampled	0.559551	0.604839	0.572519	0.641026	0.572519	0.540984
knn 10	0.570787	0.68325	0.78626	0.604106	0.78626	0.262295
knn 10 synthetic samples	0.51236	0.531317	0.469466	0.61194	0.469466	0.57377
knn 10 upsampled	0.557303	0.614481	0.599237	0.630522	0.599237	0.497268

TABLE CLVII: Numerical results of ML methods, using data between time of birth + 11 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.550562	0.137931	0.0820513	0.432432	0.0820513	0.916
Logistic regression synthetic samples	0.503371	0.472554	0.507692	0.441964	0.507692	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.561798	0	0	0	0	1
svm, linear kernel, synthetic samples	0.516854	0.512472	0.579487	0.45935	0.579487	0.468
svm, linear kernel upsampled samples	0.525843	0.463104	0.466667	0.459596	0.466667	0.572
svm, poly	0.564045	0.020202	0.0102564	0.666667	0.0102564	0.996
svm, poly synthetic samples	0.510112	0.52193	0.610256	0.455939	0.610256	0.432
svm, poly upsampled	0.503371	0.454321	0.471795	0.438095	0.471795	0.528
grid, rbf kernel	0.557303	0	0	0	0	0.992
grid, rbf kernel synthetic samples	0.503371	0.464891	0.492308	0.440367	0.492308	0.512
grid, rbf kernel upsampled	0.48764	0.497797	0.579487	0.436293	0.579487	0.416
grid, sigmoid kernel	0.552809	0.056872	0.0307692	0.375	0.0307692	0.96
grid, sigmoid kernel synthetic samples	0.496629	0.495495	0.564103	0.441767	0.564103	0.444
grid, sigmoid kernel upsampled	0.476404	0.519588	0.646154	0.434483	0.646154	0.344
random forest estimator	0.573034	0.194915	0.117949	0.560976	0.117949	0.928
random forest estimator synthetic samples	0.507865	0.379603	0.34359	0.424051	0.34359	0.636
random forest estimator, upsampled	0.505618	0.543568	0.671795	0.456446	0.671795	0.376
logistic regression	0.548315	0.17284	0.107692	0.4375	0.107692	0.892
logistic regression synthetic samples	0.503371	0.472554	0.507692	0.441964	0.507692	0.5
logistic regression upsampled	0.503371	0.454321	0.471795	0.438095	0.471795	0.528
knn 10	0.521348	0.31068	0.246154	0.421053	0.246154	0.736
knn 10 synthetic samples	0.516854	0.489311	0.528205	0.455752	0.528205	0.508
knn 10 upsampled	0.494382	0.48037	0.533333	0.436975	0.533333	0.464

TABLE CLVIII: Numerical results of ML methods, using data between time of birth + 11 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.773973	0.872587	0.997059	0.775744	0.997059	0
Logistic regression synthetic samples	0.579909	0.687075	0.594118	0.814516	0.594118	0.530612
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.776256	0.874036	1	0.776256	1	0
svm, linear kernel, synthetic samples	0.52968	0.629496	0.514706	0.810185	0.514706	0.581633
svm, linear kernel upsampled samples	0.541096	0.641711	0.529412	0.81448	0.529412	0.581633
svm, poly	0.776256	0.874036	1	0.776256	1	0
svm, poly synthetic samples	0.538813	0.639286	0.526471	0.813636	0.526471	0.581633
svm, poly upsampled	0.582192	0.689304	0.597059	0.815261	0.597059	0.530612
grid, rbf kernel	0.776256	0.874036	1	0.776256	1	0
grid, rbf kernel synthetic samples	0.586758	0.70947	0.65	0.780919	0.65	0.367347
grid, rbf kernel upsampled	0.652968	0.769697	0.747059	0.79375	0.747059	0.326531
grid, sigmoid kernel	0.746575	0.85298	0.947059	0.775904	0.947059	0.0510204
grid, sigmoid kernel synthetic samples	0.563927	0.681135	0.6	0.787645	0.6	0.438776
grid, sigmoid kernel upsampled	0.561644	0.684211	0.611765	0.776119	0.611765	0.387755
random forest estimator	0.776256	0.874036	1	0.776256	1	0
random forest estimator synthetic samples	0.671233	0.788235	0.788235	0.788235	0.788235	0.265306
random forest estimator, upsampled	0.744292	0.847411	0.914706	0.78934	0.914706	0.153061
logistic regression	0.773973	0.872587	0.997059	0.775744	0.997059	0
logistic regression synthetic samples	0.582192	0.689304	0.597059	0.815261	0.597059	0.530612
logistic regression upsampled	0.554795	0.658494	0.552941	0.813853	0.552941	0.561224
knn 10	0.769406	0.86934	0.988235	0.775982	0.988235	0.0102041
knn 10 synthetic samples	0.504566	0.606171	0.491176	0.791469	0.491176	0.55102
knn 10 upsampled	0.570776	0.67474	0.573529	0.819328	0.573529	0.561224

TABLE CLIX: Numerical results of ML methods, using data between time of birth + 12 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.577626	0.716692	0.910506	0.590909	0.910506	0.104972
Logistic regression synthetic samples	0.506849	0.55	0.513619	0.591928	0.513619	0.497238
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.586758	0.739568	1	0.586758	1	0
svm, linear kernel, synthetic samples	0.511416	0.54661	0.501946	0.6	0.501946	0.524862
svm, linear kernel upsampled samples	0.545662	0.587992	0.552529	0.628319	0.552529	0.535912
svm, poly	0.591324	0.736377	0.972763	0.592417	0.972763	0.0497238
svm, poly synthetic samples	0.509132	0.553015	0.51751	0.59375	0.51751	0.497238
svm, poly upsampled	0.543379	0.604743	0.595331	0.614458	0.595331	0.469613
grid, rbf kernel	0.593607	0.739003	0.980545	0.592941	0.980545	0.0441989
grid, rbf kernel synthetic samples	0.52968	0.581301	0.55642	0.608511	0.55642	0.491713
grid, rbf kernel upsampled	0.552511	0.634328	0.661479	0.609319	0.661479	0.39779
grid, sigmoid kernel	0.575342	0.71028	0.88716	0.592208	0.88716	0.132597
grid, sigmoid kernel synthetic samples	0.531963	0.587525	0.568093	0.608333	0.568093	0.480663
grid, sigmoid kernel upsampled	0.520548	0.583333	0.571984	0.595142	0.571984	0.447514
random forest estimator	0.577626	0.716692	0.910506	0.590909	0.910506	0.104972
random forest estimator synthetic samples	0.570776	0.645283	0.66537	0.626374	0.66537	0.436464
random forest estimator, upsampled	0.559361	0.668954	0.758755	0.59816	0.758755	0.276243
logistic regression	0.579909	0.71517	0.898833	0.59383	0.898833	0.127072
logistic regression synthetic samples	0.506849	0.55	0.513619	0.591928	0.513619	0.497238
logistic regression upsampled	0.531963	0.579055	0.548638	0.613043	0.548638	0.508287
knn 10	0.586758	0.691652	0.789883	0.615152	0.789883	0.298343
knn 10 synthetic samples	0.531963	0.557235	0.501946	0.626214	0.501946	0.574586
knn 10 upsampled	0.554795	0.619883	0.618677	0.621094	0.618677	0.464088

TABLE CLX: Numerical results of ML methods, using data between time of birth + 12 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.568493	0.247012	0.181287	0.3875	0.181287	0.816479
Logistic regression synthetic samples	0.47032	0.42	0.491228	0.366812	0.491228	0.456929
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.609589	0.0228571	0.0116959	0.5	0.0116959	0.992509
svm, linear kernel, synthetic samples	0.497717	0.458128	0.54386	0.395745	0.54386	0.468165
svm, linear kernel upsampled samples	0.493151	0.4689	0.573099	0.396761	0.573099	0.441948
svm, poly	0.609589	0.0115607	0.00584795	0.5	0.00584795	0.996255
svm, poly synthetic samples	0.518265	0.489104	0.590643	0.417355	0.590643	0.47191
svm, poly upsampled	0.506849	0.475728	0.573099	0.406639	0.573099	0.464419
grid, rbf kernel	0.577626	0.131455	0.0818713	0.333333	0.0818713	0.895131
grid, rbf kernel synthetic samples	0.534247	0.471503	0.532164	0.423256	0.532164	0.535581
grid, rbf kernel upsampled	0.541096	0.464	0.508772	0.426471	0.508772	0.561798
grid, sigmoid kernel	0.570776	0.298507	0.233918	0.412371	0.233918	0.786517
grid, sigmoid kernel synthetic samples	0.511416	0.480583	0.578947	0.410788	0.578947	0.468165
grid, sigmoid kernel upsampled	0.468037	0.459397	0.578947	0.380769	0.578947	0.397004
random forest estimator	0.584475	0.254098	0.181287	0.424658	0.181287	0.842697
random forest estimator synthetic samples	0.518265	0.391931	0.397661	0.386364	0.397661	0.595506
random forest estimator, upsampled	0.5	0.484706	0.602339	0.405512	0.602339	0.434457
logistic regression	0.575342	0.27907	0.210526	0.413793	0.210526	0.808989
logistic regression synthetic samples	0.47032	0.42	0.491228	0.366812	0.491228	0.456929
logistic regression upsampled	0.47032	0.425743	0.502924	0.369099	0.502924	0.449438
knn 10	0.589041	0.415584	0.374269	0.467153	0.374269	0.726592
knn 10 synthetic samples	0.53653	0.493766	0.578947	0.430435	0.578947	0.509363
knn 10 upsampled	0.53653	0.486076	0.561404	0.428571	0.561404	0.520599

TABLE CLXI: Numerical results of ML methods, using data between time of birth + 12 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.782407	0.877922	0.994118	0.786047	0.994118	0
Logistic regression synthetic samples	0.55787	0.664323	0.555882	0.825328	0.555882	0.565217
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.787037	0.880829	1	0.787037	1	0
svm, linear kernel, synthetic samples	0.5	0.590909	0.458824	0.829787	0.458824	0.652174
svm, linear kernel upsampled samples	0.486111	0.566406	0.426471	0.843023	0.426471	0.706522
svm, poly	0.787037	0.880829	1	0.787037	1	0
svm, poly synthetic samples	0.520833	0.610169	0.476471	0.848168	0.476471	0.684783
svm, poly upsampled	0.525463	0.623853	0.5	0.829268	0.5	0.619565
grid, rbf kernel	0.787037	0.880829	1	0.787037	1	0
grid, rbf kernel synthetic samples	0.555556	0.66782	0.567647	0.810924	0.567647	0.51087
grid, rbf kernel upsampled	0.587963	0.703333	0.620588	0.811538	0.620588	0.467391
grid, sigmoid kernel	0.770833	0.868176	0.958824	0.793187	0.958824	0.076087
grid, sigmoid kernel synthetic samples	0.553241	0.652252	0.532353	0.84186	0.532353	0.630435
grid, sigmoid kernel upsampled	0.534722	0.645503	0.538235	0.806167	0.538235	0.521739
random forest estimator	0.787037	0.880829	1	0.787037	1	0
random forest estimator synthetic samples	0.657407	0.778443	0.764706	0.792683	0.764706	0.26087
random forest estimator, upsampled	0.75	0.852459	0.917647	0.795918	0.917647	0.130435
logistic regression	0.782407	0.877922	0.994118	0.786047	0.994118	0
logistic regression synthetic samples	0.560185	0.666667	0.558824	0.826087	0.558824	0.565217
logistic regression upsampled	0.539352	0.636197	0.511765	0.84058	0.511765	0.641304
knn 10	0.768519	0.868766	0.973529	0.78436	0.973529	0.0108696
knn 10 synthetic samples	0.476852	0.587591	0.473529	0.774038	0.473529	0.48913
knn 10 upsampled	0.550926	0.673401	0.588235	0.787402	0.588235	0.413043

TABLE CLXII: Numerical results of ML methods, using data between time of birth + 13 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.608796	0.736349	0.904215	0.621053	0.904215	0.157895
Logistic regression synthetic samples	0.523148	0.559829	0.501916	0.63285	0.501916	0.555556
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613426	0.754772	0.984674	0.611905	0.984674	0.0467836
svm, linear kernel, synthetic samples	0.490741	0.481132	0.390805	0.625767	0.390805	0.643275
svm, linear kernel upsampled samples	0.488426	0.477541	0.386973	0.623457	0.386973	0.643275
svm, poly	0.611111	0.753666	0.984674	0.610451	0.984674	0.0409357
svm, poly synthetic samples	0.476852	0.44335	0.344828	0.62069	0.344828	0.678363
svm, poly upsampled	0.474537	0.485261	0.409962	0.594444	0.409962	0.573099
grid, rbf kernel	0.613426	0.75405	0.980843	0.61244	0.980843	0.0526316
grid, rbf kernel synthetic samples	0.490741	0.488372	0.402299	0.621302	0.402299	0.625731
grid, rbf kernel upsampled	0.486111	0.50885	0.440613	0.602094	0.440613	0.555556
grid, sigmoid kernel	0.585648	0.728376	0.91954	0.603015	0.91954	0.0760234
grid, sigmoid kernel synthetic samples	0.511574	0.587084	0.574713	0.6	0.574713	0.415205
grid, sigmoid kernel upsampled	0.527778	0.603113	0.59387	0.612648	0.59387	0.426901
random forest estimator	0.592593	0.726708	0.896552	0.610966	0.896552	0.128655
random forest estimator synthetic samples	0.509259	0.574297	0.547893	0.603376	0.547893	0.450292
random forest estimator, upsampled	0.583333	0.672727	0.708812	0.640138	0.708812	0.391813
logistic regression	0.606481	0.732704	0.89272	0.621333	0.89272	0.169591
logistic regression synthetic samples	0.523148	0.559829	0.501916	0.63285	0.501916	0.555556
logistic regression upsampled	0.5	0.546218	0.498084	0.604651	0.498084	0.502924
knn 10	0.523148	0.637324	0.693487	0.589577	0.693487	0.263158
knn 10 synthetic samples	0.493056	0.520788	0.455939	0.607143	0.455939	0.549708
knn 10 upsampled	0.490741	0.54918	0.51341	0.590308	0.51341	0.45614

TABLE CLXIII: Numerical results of ML methods, using data between time of birth + 13 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.574074	0.239669	0.174699	0.381579	0.174699	0.823308
Logistic regression synthetic samples	0.50463	0.433862	0.493976	0.386792	0.493976	0.511278
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613426	0.0457143	0.0240964	0.444444	0.0240964	0.981203
svm, linear kernel, synthetic samples	0.493056	0.461916	0.566265	0.390041	0.566265	0.447368
svm, linear kernel upsampled samples	0.476852	0.44878	0.554217	0.377049	0.554217	0.428571
svm, poly	0.613426	0.0346821	0.0180723	0.428571	0.0180723	0.984962
svm, poly synthetic samples	0.472222	0.464789	0.596386	0.380769	0.596386	0.394737
svm, poly upsampled	0.453704	0.443396	0.566265	0.364341	0.566265	0.383459
grid, rbf kernel	0.615741	0.0119048	0.0060241	0.5	0.0060241	0.996241
grid, rbf kernel synthetic samples	0.513889	0.485294	0.596386	0.409091	0.596386	0.462406
grid, rbf kernel upsampled	0.497685	0.445013	0.524096	0.386667	0.524096	0.481203
grid, sigmoid kernel	0.56713	0.288973	0.228916	0.391753	0.228916	0.778195
grid, sigmoid kernel synthetic samples	0.50463	0.454082	0.536145	0.393805	0.536145	0.484962
grid, sigmoid kernel upsampled	0.474537	0.473318	0.614458	0.384906	0.614458	0.387218
random forest estimator	0.587963	0.212389	0.144578	0.4	0.144578	0.864662
random forest estimator synthetic samples	0.520833	0.38209	0.385542	0.378698	0.385542	0.605263
random forest estimator, upsampled	0.472222	0.479452	0.63253	0.386029	0.63253	0.37218
logistic regression	0.578704	0.260163	0.192771	0.4	0.192771	0.819549
logistic regression synthetic samples	0.50463	0.433862	0.493976	0.386792	0.493976	0.511278
logistic regression upsampled	0.5	0.44898	0.53012	0.389381	0.53012	0.481203
knn 10	0.597222	0.408163	0.361446	0.46875	0.361446	0.744361
knn 10 synthetic samples	0.543981	0.48294	0.554217	0.427907	0.554217	0.537594
knn 10 upsampled	0.555556	0.481081	0.536145	0.436275	0.536145	0.567669

TABLE CLXIV: Numerical results of ML methods, using data between time of birth + 13 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.805164	0.891786	0.994186	0.808511	0.994186	0.0121951
Logistic regression synthetic samples	0.514085	0.628366	0.508721	0.821596	0.508721	0.536585
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.807512	0.893506	1	0.807512	1	0
svm, linear kernel, synthetic samples	0.443662	0.543353	0.409884	0.805714	0.409884	0.585366
svm, linear kernel upsampled samples	0.467136	0.572505	0.44186	0.812834	0.44186	0.573171
svm, poly	0.807512	0.893506	1	0.807512	1	0
svm, poly synthetic samples	0.446009	0.547893	0.415698	0.803371	0.415698	0.573171
svm, poly upsampled	0.476526	0.589319	0.465116	0.80402	0.465116	0.52439
grid, rbf kernel	0.807512	0.893506	1	0.807512	1	0
grid, rbf kernel synthetic samples	0.511737	0.625899	0.505814	0.820755	0.505814	0.536585
grid, rbf kernel upsampled	0.492958	0.617021	0.505814	0.790909	0.505814	0.439024
grid, sigmoid kernel	0.800469	0.886212	0.962209	0.82134	0.962209	0.121951
grid, sigmoid kernel synthetic samples	0.497653	0.596226	0.459302	0.849462	0.459302	0.658537
grid, sigmoid kernel upsampled	0.532864	0.646536	0.52907	0.83105	0.52907	0.54878
random forest estimator	0.807512	0.893506	1	0.807512	1	0
random forest estimator synthetic samples	0.669014	0.791111	0.776163	0.806647	0.776163	0.219512
random forest estimator, upsampled	0.71831	0.832869	0.869186	0.799465	0.869186	0.0853659
logistic regression	0.805164	0.891786	0.994186	0.808511	0.994186	0.0121951
logistic regression synthetic samples	0.514085	0.628366	0.508721	0.821596	0.508721	0.536585
logistic regression upsampled	0.507042	0.620939	0.5	0.819048	0.5	0.536585
knn 10	0.786385	0.878828	0.959302	0.810811	0.959302	0.0609756
knn 10 synthetic samples	0.502347	0.615942	0.494186	0.817308	0.494186	0.536585
knn 10 upsampled	0.514085	0.648557	0.555233	0.779592	0.555233	0.341463

TABLE CLXV: Numerical results of ML methods, using data between time of birth + 14 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.589202	0.728682	0.896947	0.613577	0.896947	0.097561
Logistic regression synthetic samples	0.553991	0.60084	0.545802	0.668224	0.545802	0.567073
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.617371	0.760646	0.98855	0.618138	0.98855	0.0243902
svm, linear kernel, synthetic samples	0.551643	0.572707	0.48855	0.691892	0.48855	0.652439
svm, linear kernel upsampled samples	0.521127	0.540541	0.458015	0.659341	0.458015	0.621951
svm, poly	0.607981	0.75405	0.977099	0.613909	0.977099	0.0182927
svm, poly synthetic samples	0.530516	0.547511	0.461832	0.672222	0.461832	0.640244
svm, poly upsampled	0.49061	0.51236	0.435115	0.622951	0.435115	0.579268
grid, rbf kernel	0.610329	0.753709	0.969466	0.616505	0.969466	0.0365854
grid, rbf kernel synthetic samples	0.551643	0.587473	0.519084	0.676617	0.519084	0.603659
grid, rbf kernel upsampled	0.549296	0.609756	0.572519	0.652174	0.572519	0.512195
grid, sigmoid kernel	0.584507	0.723869	0.885496	0.612137	0.885496	0.103659
grid, sigmoid kernel synthetic samples	0.502347	0.526786	0.450382	0.634409	0.450382	0.585366
grid, sigmoid kernel upsampled	0.516432	0.563559	0.507634	0.633333	0.507634	0.530488
random forest estimator	0.603286	0.73717	0.90458	0.622047	0.90458	0.121951
random forest estimator synthetic samples	0.56338	0.638132	0.625954	0.650794	0.625954	0.463415
random forest estimator, upsampled	0.561033	0.670194	0.725191	0.622951	0.725191	0.29878
logistic regression	0.579812	0.720749	0.881679	0.609499	0.881679	0.097561
logistic regression synthetic samples	0.553991	0.60084	0.545802	0.668224	0.545802	0.567073
logistic regression upsampled	0.523474	0.563441	0.5	0.64532	0.5	0.560976
knn 10	0.579812	0.683186	0.736641	0.636964	0.736641	0.329268
knn 10 synthetic samples	0.511737	0.537778	0.461832	0.643617	0.461832	0.591463
knn 10 upsampled	0.511737	0.582329	0.553435	0.614407	0.553435	0.445122

TABLE CLXVI: Numerical results of ML methods, using data between time of birth + 14 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.539906	0.125	0.076087	0.35	0.076087	0.892562
Logistic regression synthetic samples	0.521127	0.497537	0.548913	0.454955	0.548913	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.568075	0	0	0	0	1
svm, linear kernel, synthetic samples	0.511737	0.518519	0.608696	0.451613	0.608696	0.438017
svm, linear kernel upsampled samples	0.497653	0.540773	0.684783	0.446809	0.684783	0.355372
svm, poly	0.56338	0.03125	0.0163043	0.375	0.0163043	0.979339
svm, poly synthetic samples	0.514085	0.510638	0.586957	0.451883	0.586957	0.458678
svm, poly upsampled	0.516432	0.531818	0.63587	0.457031	0.63587	0.42562
grid, rbf kernel	0.553991	0.0104167	0.00543478	0.125	0.00543478	0.971074
grid, rbf kernel synthetic samples	0.556338	0.521519	0.559783	0.488152	0.559783	0.553719
grid, rbf kernel upsampled	0.546948	0.490765	0.505435	0.476923	0.505435	0.578512
grid, sigmoid kernel	0.556338	0.222222	0.146739	0.457627	0.146739	0.867769
grid, sigmoid kernel synthetic samples	0.495305	0.455696	0.48913	0.42654	0.48913	0.5
grid, sigmoid kernel upsampled	0.478873	0.430769	0.456522	0.407767	0.456522	0.495868
random forest estimator	0.558685	0.175439	0.108696	0.454545	0.108696	0.900826
random forest estimator synthetic samples	0.549296	0.478261	0.478261	0.478261	0.478261	0.603306
random forest estimator, upsampled	0.485915	0.501139	0.597826	0.431373	0.597826	0.400826
logistic regression	0.549296	0.179487	0.11413	0.42	0.11413	0.880165
logistic regression synthetic samples	0.521127	0.497537	0.548913	0.454955	0.548913	0.5
logistic regression upsampled	0.488263	0.5	0.592391	0.43254	0.592391	0.409091
knn 10	0.584507	0.40404	0.326087	0.530973	0.326087	0.780992
knn 10 synthetic samples	0.544601	0.512563	0.554348	0.476636	0.554348	0.53719
knn 10 upsampled	0.549296	0.497382	0.516304	0.479798	0.516304	0.57438

TABLE CLXVII: Numerical results of ML methods, using data between time of birth + 14 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.784689	0.879357	0.990937	0.790361	0.990937	0
Logistic regression synthetic samples	0.566986	0.671506	0.558912	0.840909	0.558912	0.597701
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.791866	0.883845	1	0.791866	1	0
svm, linear kernel, synthetic samples	0.538278	0.632381	0.501511	0.85567	0.501511	0.678161
svm, linear kernel upsampled samples	0.514354	0.614801	0.489426	0.826531	0.489426	0.609195
svm, poly	0.789474	0.882353	0.996979	0.791367	0.996979	0
svm, poly synthetic samples	0.533493	0.627151	0.495468	0.854167	0.495468	0.678161
svm, poly upsampled	0.526316	0.626415	0.501511	0.834171	0.501511	0.62069
grid, rbf kernel	0.789474	0.882353	0.996979	0.791367	0.996979	0
grid, rbf kernel synthetic samples	0.54067	0.643123	0.522659	0.835749	0.522659	0.609195
grid, rbf kernel upsampled	0.58134	0.69459	0.601208	0.822314	0.601208	0.505747
grid, sigmoid kernel	0.744019	0.851182	0.924471	0.78866	0.924471	0.0574713
grid, sigmoid kernel synthetic samples	0.552632	0.660617	0.549849	0.827273	0.549849	0.563218
grid, sigmoid kernel upsampled	0.543062	0.663139	0.567976	0.79661	0.567976	0.448276
random forest estimator	0.791866	0.883845	1	0.791866	1	0
random forest estimator synthetic samples	0.677033	0.791988	0.776435	0.808176	0.776435	0.298851
random forest estimator, upsampled	0.722488	0.833811	0.879154	0.792916	0.879154	0.126437
logistic regression	0.779904	0.876344	0.984894	0.789346	0.984894	0
logistic regression synthetic samples	0.566986	0.672694	0.561934	0.837838	0.561934	0.586207
logistic regression upsampled	0.5311	0.643636	0.534743	0.808219	0.534743	0.517241
knn 10	0.772727	0.870748	0.966767	0.792079	0.966767	0.0344828
knn 10 synthetic samples	0.464115	0.572519	0.453172	0.777202	0.453172	0.505747
knn 10 upsampled	0.516746	0.636691	0.534743	0.786667	0.534743	0.448276

TABLE CLXVIII: Numerical results of ML methods, using data between time of birth + 15 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.574163	0.720126	0.919679	0.591731	0.919679	0.0650888
Logistic regression synthetic samples	0.523923	0.579281	0.550201	0.611607	0.550201	0.485207
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.595694	0.746627	1	0.595694	1	0
svm, linear kernel, synthetic samples	0.521531	0.557522	0.506024	0.62069	0.506024	0.544379
svm, linear kernel upsampled samples	0.504785	0.530612	0.46988	0.609375	0.46988	0.556213
svm, poly	0.590909	0.738132	0.967871	0.596535	0.967871	0.035503
svm, poly synthetic samples	0.502392	0.539823	0.48996	0.600985	0.48996	0.52071
svm, poly upsampled	0.495215	0.540305	0.497992	0.590476	0.497992	0.491124
grid, rbf kernel	0.593301	0.740854	0.975904	0.597052	0.975904	0.0295858
grid, rbf kernel synthetic samples	0.521531	0.583333	0.562249	0.606061	0.562249	0.461538
grid, rbf kernel upsampled	0.495215	0.550107	0.518072	0.586364	0.518072	0.461538
grid, sigmoid kernel	0.586124	0.733436	0.955823	0.595	0.955823	0.0414201
grid, sigmoid kernel synthetic samples	0.523923	0.542529	0.473896	0.634409	0.473896	0.597633
grid, sigmoid kernel upsampled	0.516746	0.551111	0.497992	0.616915	0.497992	0.544379
random forest estimator	0.614833	0.748044	0.959839	0.612821	0.959839	0.106509
random forest estimator synthetic samples	0.57177	0.652427	0.674699	0.631579	0.674699	0.420118
random forest estimator, upsampled	0.555024	0.669039	0.75502	0.600639	0.75502	0.260355
logistic regression	0.58134	0.724409	0.923695	0.595855	0.923695	0.0769231
logistic regression synthetic samples	0.523923	0.579281	0.550201	0.611607	0.550201	0.485207
logistic regression upsampled	0.509569	0.561028	0.526104	0.600917	0.526104	0.485207
knn 10	0.588517	0.679104	0.730924	0.634146	0.730924	0.378698
knn 10 synthetic samples	0.523923	0.51816	0.429719	0.652439	0.429719	0.662722
knn 10 upsampled	0.523923	0.55079	0.48996	0.628866	0.48996	0.573964

TABLE CLXIX: Numerical results of ML methods, using data between time of birth + 15 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.566986	0.242678	0.168605	0.432836	0.168605	0.845528
Logistic regression synthetic samples	0.485646	0.435696	0.482558	0.397129	0.482558	0.487805
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.590909	0.0115607	0.00581395	1	0.00581395	1
svm, linear kernel, synthetic samples	0.502392	0.495146	0.593023	0.425	0.593023	0.439024
svm, linear kernel upsampled samples	0.5	0.468193	0.534884	0.41629	0.534884	0.47561
svm, poly	0.578947	0.032967	0.0174419	0.3	0.0174419	0.971545
svm, poly synthetic samples	0.504785	0.52194	0.656977	0.43295	0.656977	0.398374
svm, poly upsampled	0.502392	0.431694	0.459302	0.407216	0.459302	0.53252
grid, rbf kernel	0.58134	0.0540541	0.0290698	0.384615	0.0290698	0.96748
grid, rbf kernel synthetic samples	0.511962	0.502439	0.598837	0.432773	0.598837	0.45122
grid, rbf kernel upsampled	0.478469	0.443878	0.505814	0.395455	0.505814	0.45935
grid, sigmoid kernel	0.583732	0.0543478	0.0290698	0.416667	0.0290698	0.971545
grid, sigmoid kernel synthetic samples	0.5	0.51954	0.656977	0.429658	0.656977	0.390244
grid, sigmoid kernel upsampled	0.485646	0.484412	0.587209	0.412245	0.587209	0.414634
random forest estimator	0.574163	0.232759	0.156977	0.45	0.156977	0.865854
random forest estimator synthetic samples	0.516746	0.41954	0.424419	0.414773	0.424419	0.581301
random forest estimator, upsampled	0.464115	0.474178	0.587209	0.397638	0.587209	0.378049
logistic regression	0.54067	0.232	0.168605	0.371795	0.168605	0.800813
logistic regression synthetic samples	0.485646	0.435696	0.482558	0.397129	0.482558	0.487805
logistic regression upsampled	0.5	0.445623	0.488372	0.409756	0.488372	0.50813
knn 10	0.538278	0.318021	0.261628	0.405405	0.261628	0.731707
knn 10 synthetic samples	0.497608	0.450262	0.5	0.409524	0.5	0.495935
knn 10 upsampled	0.507177	0.427778	0.447674	0.409574	0.447674	0.54878

TABLE CLXX: Numerical results of ML methods, using data between time of birth + 15 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.781553	0.877384	1	0.781553	1	0
Logistic regression synthetic samples	0.504854	0.617978	0.512422	0.778302	0.512422	0.477778
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.781553	0.877384	1	0.781553	1	0
svm, linear kernel, synthetic samples	0.487864	0.580517	0.453416	0.80663	0.453416	0.611111
svm, linear kernel upsampled samples	0.497573	0.596491	0.475155	0.801047	0.475155	0.577778
svm, poly	0.781553	0.877384	1	0.781553	1	0
svm, poly synthetic samples	0.487864	0.591876	0.475155	0.784615	0.475155	0.533333
svm, poly upsampled	0.502427	0.609524	0.496894	0.788177	0.496894	0.522222
grid, rbf kernel	0.781553	0.877384	1	0.781553	1	0
grid, rbf kernel synthetic samples	0.531553	0.648452	0.552795	0.784141	0.552795	0.455556
grid, rbf kernel upsampled	0.553398	0.680556	0.608696	0.771654	0.608696	0.355556
grid, sigmoid kernel	0.762136	0.86236	0.953416	0.787179	0.953416	0.0777778
grid, sigmoid kernel synthetic samples	0.558252	0.67029	0.574534	0.804348	0.574534	0.5
grid, sigmoid kernel upsampled	0.541262	0.656987	0.562112	0.790393	0.562112	0.466667
random forest estimator	0.781553	0.877384	1	0.781553	1	0
random forest estimator synthetic samples	0.660194	0.785276	0.795031	0.775758	0.795031	0.177778
random forest estimator, upsampled	0.723301	0.83526	0.897516	0.781081	0.897516	0.1
logistic regression	0.776699	0.874317	0.993789	0.780488	0.993789	0
logistic regression synthetic samples	0.504854	0.617978	0.512422	0.778302	0.512422	0.477778
logistic regression upsampled	0.558252	0.673835	0.583851	0.79661	0.583851	0.466667
knn 10	0.762136	0.864266	0.968944	0.78	0.968944	0.0222222
knn 10 synthetic samples	0.470874	0.597786	0.503106	0.736364	0.503106	0.355556
knn 10 upsampled	0.521845	0.645045	0.555901	0.76824	0.555901	0.4

TABLE CLXXI: Numerical results of ML methods, using data between time of birth + 16 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.59466	0.7328	0.90873	0.613941	0.90873	0.1
Logistic regression synthetic samples	0.521845	0.58351	0.547619	0.624434	0.547619	0.48125
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.616505	0.75841	0.984127	0.616915	0.984127	0.0375
svm, linear kernel, synthetic samples	0.509709	0.553097	0.496032	0.625	0.496032	0.53125
svm, linear kernel upsampled samples	0.507282	0.547884	0.488095	0.624365	0.488095	0.5375
svm, poly	0.616505	0.757669	0.980159	0.6175	0.980159	0.04375
svm, poly synthetic samples	0.502427	0.535147	0.468254	0.624339	0.468254	0.55625
svm, poly upsampled	0.509709	0.545045	0.480159	0.630208	0.480159	0.55625
grid, rbf kernel	0.606796	0.751534	0.972222	0.6125	0.972222	0.03125
grid, rbf kernel synthetic samples	0.519417	0.576923	0.535714	0.625	0.535714	0.49375
grid, rbf kernel upsampled	0.521845	0.60521	0.599206	0.611336	0.599206	0.4
grid, sigmoid kernel	0.61165	0.746835	0.936508	0.621053	0.936508	0.1
grid, sigmoid kernel synthetic samples	0.538835	0.579646	0.519841	0.655	0.519841	0.56875
grid, sigmoid kernel upsampled	0.514563	0.568966	0.52381	0.622642	0.52381	0.5
random forest estimator	0.614078	0.751174	0.952381	0.620155	0.952381	0.08125
random forest estimator synthetic samples	0.555825	0.64466	0.65873	0.631179	0.65873	0.39375
random forest estimator, upsampled	0.589806	0.699822	0.781746	0.633441	0.781746	0.2875
logistic regression	0.599515	0.733441	0.900794	0.618529	0.900794	0.125
logistic regression synthetic samples	0.521845	0.58351	0.547619	0.624434	0.547619	0.48125
logistic regression upsampled	0.507282	0.56531	0.52381	0.613953	0.52381	0.48125
knn 10	0.558252	0.682927	0.777778	0.608696	0.777778	0.2125
knn 10 synthetic samples	0.541262	0.595289	0.551587	0.646512	0.551587	0.525
knn 10 upsampled	0.546117	0.623742	0.615079	0.632653	0.615079	0.4375

TABLE CLXXII: Numerical results of ML methods, using data between time of birth + 16 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.56068	0.306513	0.242424	0.416667	0.242424	0.773279
Logistic regression synthetic samples	0.521845	0.503778	0.606061	0.431034	0.606061	0.465587
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.599515	0.0350877	0.0181818	0.5	0.0181818	0.987854
svm, linear kernel, synthetic samples	0.487864	0.491566	0.618182	0.408	0.618182	0.40081
svm, linear kernel upsampled samples	0.478155	0.447301	0.527273	0.388393	0.527273	0.445344
svm, poly	0.59466	0.0118343	0.00606061	0.25	0.00606061	0.987854
svm, poly synthetic samples	0.5	0.5	0.624242	0.417004	0.624242	0.417004
svm, poly upsampled	0.487864	0.476427	0.581818	0.403361	0.581818	0.425101
grid, rbf kernel	0.584951	0.11399	0.0666667	0.392857	0.0666667	0.931174
grid, rbf kernel synthetic samples	0.521845	0.493573	0.581818	0.428571	0.581818	0.481781
grid, rbf kernel upsampled	0.502427	0.508393	0.642424	0.420635	0.642424	0.408907
grid, sigmoid kernel	0.584951	0.0952381	0.0545455	0.375	0.0545455	0.939271
grid, sigmoid kernel synthetic samples	0.495146	0.5	0.630303	0.414343	0.630303	0.404858
grid, sigmoid kernel upsampled	0.519417	0.481675	0.557576	0.423963	0.557576	0.493927
random forest estimator	0.558252	0.208696	0.145455	0.369231	0.145455	0.834008
random forest estimator synthetic samples	0.521845	0.374603	0.357576	0.393333	0.357576	0.631579
random forest estimator, upsampled	0.492718	0.510539	0.660606	0.416031	0.660606	0.380567
logistic regression	0.56068	0.306513	0.242424	0.416667	0.242424	0.773279
logistic regression synthetic samples	0.521845	0.503778	0.606061	0.431034	0.606061	0.465587
logistic regression upsampled	0.480583	0.488038	0.618182	0.403162	0.618182	0.388664
knn 10	0.533981	0.368421	0.339394	0.402878	0.339394	0.663968
knn 10 synthetic samples	0.497573	0.450928	0.515152	0.400943	0.515152	0.48583
knn 10 upsampled	0.5	0.463542	0.539394	0.406393	0.539394	0.473684

TABLE CLXXIII: Numerical results of ML methods, using data between time of birth + 16 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.789216	0.882192	0.993827	0.793103	0.993827	0
Logistic regression synthetic samples	0.556373	0.665434	0.555556	0.829493	0.555556	0.559524
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.794118	0.885246	1	0.794118	1	0
svm, linear kernel, synthetic samples	0.485294	0.574899	0.438272	0.835294	0.438272	0.666667
svm, linear kernel upsampled samples	0.485294	0.581673	0.450617	0.820225	0.450617	0.619048
svm, poly	0.794118	0.885246	1	0.794118	1	0
svm, poly synthetic samples	0.519608	0.611111	0.475309	0.855556	0.475309	0.690476
svm, poly upsampled	0.593137	0.700361	0.598765	0.843478	0.598765	0.571429
grid, rbf kernel	0.794118	0.885246	1	0.794118	1	0
grid, rbf kernel synthetic samples	0.610294	0.719577	0.62963	0.839506	0.62963	0.535714
grid, rbf kernel upsampled	0.683824	0.794258	0.768519	0.821782	0.768519	0.357143
grid, sigmoid kernel	0.769608	0.868715	0.959877	0.793367	0.959877	0.0357143
grid, sigmoid kernel synthetic samples	0.52451	0.642066	0.537037	0.798165	0.537037	0.47619
grid, sigmoid kernel upsampled	0.522059	0.632768	0.518519	0.811594	0.518519	0.535714
random forest estimator	0.794118	0.885246	1	0.794118	1	0
random forest estimator synthetic samples	0.666667	0.785489	0.768519	0.803226	0.768519	0.27381
random forest estimator, upsampled	0.759804	0.85879	0.919753	0.805405	0.919753	0.142857
logistic regression	0.789216	0.882192	0.993827	0.793103	0.993827	0
logistic regression synthetic samples	0.556373	0.665434	0.555556	0.829493	0.555556	0.559524
logistic regression upsampled	0.573529	0.683636	0.580247	0.831858	0.580247	0.547619
knn 10	0.781863	0.877579	0.984568	0.791563	0.984568	0
knn 10 synthetic samples	0.487745	0.597303	0.478395	0.794872	0.478395	0.52381
knn 10 upsampled	0.57598	0.694885	0.608025	0.8107	0.608025	0.452381

TABLE CLXXIV: Numerical results of ML methods, using data between time of birth + 17 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.607843	0.745223	0.92126	0.625668	0.92126	0.0909091
Logistic regression synthetic samples	0.578431	0.640167	0.602362	0.683036	0.602362	0.538961
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.622549	0.763804	0.980315	0.625628	0.980315	0.0324675
svm, linear kernel, synthetic samples	0.571078	0.623656	0.570866	0.687204	0.570866	0.571429
svm, linear kernel upsampled samples	0.529412	0.612903	0.598425	0.628099	0.598425	0.415584
svm, poly	0.625	0.765697	0.984252	0.626566	0.984252	0.0324675
svm, poly synthetic samples	0.556373	0.61242	0.562992	0.671362	0.562992	0.545455
svm, poly upsampled	0.534314	0.625984	0.625984	0.625984	0.625984	0.383117
grid, rbf kernel	0.625	0.765697	0.984252	0.626566	0.984252	0.0324675
grid, rbf kernel synthetic samples	0.571078	0.653465	0.649606	0.657371	0.649606	0.441558
grid, rbf kernel upsampled	0.563725	0.662879	0.688976	0.638686	0.688976	0.357143
grid, sigmoid kernel	0.620098	0.747967	0.905512	0.637119	0.905512	0.149351
grid, sigmoid kernel synthetic samples	0.573529	0.628205	0.57874	0.686916	0.57874	0.564935
grid, sigmoid kernel upsampled	0.531863	0.606186	0.57874	0.636364	0.57874	0.454545
random forest estimator	0.602941	0.743671	0.925197	0.621693	0.925197	0.0714286
random forest estimator synthetic samples	0.583333	0.675573	0.69685	0.655556	0.69685	0.396104
random forest estimator, upsampled	0.571078	0.692443	0.775591	0.625397	0.775591	0.233766
logistic regression	0.610294	0.743961	0.909449	0.629428	0.909449	0.116883
logistic regression synthetic samples	0.578431	0.640167	0.602362	0.683036	0.602362	0.538961
logistic regression upsampled	0.553922	0.619247	0.582677	0.660714	0.582677	0.506494
knn 10	0.593137	0.712803	0.811024	0.635802	0.811024	0.233766
knn 10 synthetic samples	0.541667	0.589011	0.527559	0.666667	0.527559	0.564935
knn 10 upsampled	0.539216	0.61157	0.582677	0.643478	0.582677	0.467532

TABLE CLXXV: Numerical results of ML methods, using data between time of birth + 17 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.583333	0.182692	0.104972	0.703704	0.104972	0.964758
Logistic regression synthetic samples	0.517157	0.480211	0.502762	0.459596	0.502762	0.528634
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.556373	0	0	0	0	1
svm, linear kernel, synthetic samples	0.529412	0.497382	0.524862	0.472637	0.524862	0.53304
svm, linear kernel upsampled samples	0.539216	0.548077	0.629834	0.485106	0.629834	0.46696
svm, poly	0.556373	0.010929	0.00552486	0.5	0.00552486	0.995595
svm, poly synthetic samples	0.517157	0.540793	0.640884	0.467742	0.640884	0.418502
svm, poly upsampled	0.529412	0.507692	0.546961	0.473684	0.546961	0.515419
grid, rbf kernel	0.563725	0.0430108	0.0220994	0.8	0.0220994	0.995595
grid, rbf kernel synthetic samples	0.536765	0.557377	0.657459	0.48374	0.657459	0.440529
grid, rbf kernel upsampled	0.52451	0.535885	0.618785	0.472574	0.618785	0.449339
grid, sigmoid kernel	0.541667	0.0410256	0.0220994	0.285714	0.0220994	0.955947
grid, sigmoid kernel synthetic samples	0.477941	0.481752	0.546961	0.430435	0.546961	0.422907
grid, sigmoid kernel upsampled	0.541667	0.549398	0.629834	0.487179	0.629834	0.471366
random forest estimator	0.566176	0.176744	0.104972	0.558824	0.104972	0.933921
random forest estimator synthetic samples	0.522059	0.396285	0.353591	0.450704	0.353591	0.656388
random forest estimator, upsampled	0.485294	0.524887	0.640884	0.444444	0.640884	0.361233
logistic regression	0.571078	0.200913	0.121547	0.578947	0.121547	0.929515
logistic regression synthetic samples	0.514706	0.47619	0.497238	0.456853	0.497238	0.528634
logistic regression upsampled	0.531863	0.53753	0.61326	0.478448	0.61326	0.46696
knn 10	0.551471	0.407767	0.348066	0.492188	0.348066	0.713656
knn 10 synthetic samples	0.517157	0.515971	0.58011	0.464602	0.58011	0.46696
knn 10 upsampled	0.509804	0.516908	0.59116	0.459227	0.59116	0.444934

TABLE CLXXVI: Numerical results of ML methods, using data between time of birth + 17 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.794554	0.885201	0.966767	0.816327	0.966767	0.0136986
Logistic regression synthetic samples	0.529703	0.644195	0.519637	0.847291	0.519637	0.575342
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.819307	0.90068	1	0.819307	1	0
svm, linear kernel, synthetic samples	0.49505	0.598425	0.459215	0.858757	0.459215	0.657534
svm, linear kernel upsampled samples	0.554455	0.681979	0.583082	0.821277	0.583082	0.424658
svm, poly	0.816832	0.899183	0.996979	0.818859	0.996979	0
svm, poly synthetic samples	0.534653	0.645283	0.516616	0.859296	0.516616	0.616438
svm, poly upsampled	0.601485	0.728499	0.652568	0.824427	0.652568	0.369863
grid, rbf kernel	0.816832	0.899183	0.996979	0.818859	0.996979	0
grid, rbf kernel synthetic samples	0.559406	0.687719	0.592145	0.820084	0.592145	0.410959
grid, rbf kernel upsampled	0.660891	0.781499	0.740181	0.827703	0.740181	0.30137
grid, sigmoid kernel	0.792079	0.883008	0.957704	0.819121	0.957704	0.0410959
grid, sigmoid kernel synthetic samples	0.509901	0.616279	0.480363	0.859459	0.480363	0.643836
grid, sigmoid kernel upsampled	0.509901	0.62069	0.489426	0.848168	0.489426	0.60274
random forest estimator	0.819307	0.90068	1	0.819307	1	0
random forest estimator synthetic samples	0.64604	0.774803	0.743202	0.809211	0.743202	0.205479
random forest estimator, upsampled	0.747525	0.852601	0.891239	0.817175	0.891239	0.0958904
logistic regression	0.79703	0.886427	0.966767	0.818414	0.966767	0.0273973
logistic regression synthetic samples	0.529703	0.644195	0.519637	0.847291	0.519637	0.575342
logistic regression upsampled	0.55198	0.677362	0.574018	0.826087	0.574018	0.452055
knn 10	0.799505	0.887967	0.969789	0.818878	0.969789	0.0273973
knn 10 synthetic samples	0.512376	0.624762	0.495468	0.845361	0.495468	0.589041
knn 10 upsampled	0.586634	0.706503	0.607251	0.844538	0.607251	0.493151

TABLE CLXXVII: Numerical results of ML methods, using data between time of birth + 18 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.596535	0.72326	0.806818	0.655385	0.806818	0.2
Logistic regression synthetic samples	0.544554	0.6	0.522727	0.704082	0.522727	0.585714
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.658416	0.791541	0.992424	0.658291	0.992424	0.0285714
svm, linear kernel, synthetic samples	0.524752	0.567568	0.477273	0.7	0.477273	0.614286
svm, linear kernel upsampled samples	0.54703	0.614737	0.55303	0.691943	0.55303	0.535714
svm, poly	0.658416	0.788344	0.973485	0.662371	0.973485	0.0642857
svm, poly synthetic samples	0.529703	0.588745	0.515152	0.686869	0.515152	0.557143
svm, poly upsampled	0.534653	0.62249	0.587121	0.662393	0.587121	0.435714
grid, rbf kernel	0.621287	0.755981	0.897727	0.652893	0.897727	0.1
grid, rbf kernel synthetic samples	0.519802	0.580087	0.507576	0.676768	0.507576	0.542857
grid, rbf kernel upsampled	0.55198	0.647173	0.628788	0.666667	0.628788	0.407143
grid, sigmoid kernel	0.628713	0.761905	0.909091	0.655738	0.909091	0.1
grid, sigmoid kernel synthetic samples	0.534653	0.594828	0.522727	0.69	0.522727	0.557143
grid, sigmoid kernel upsampled	0.54703	0.628803	0.587121	0.676856	0.587121	0.471429
random forest estimator	0.638614	0.760656	0.878788	0.67052	0.878788	0.185714
random forest estimator synthetic samples	0.544554	0.62449	0.579545	0.676991	0.579545	0.478571
random forest estimator, upsampled	0.594059	0.70073	0.727273	0.676056	0.727273	0.342857
logistic regression	0.594059	0.718213	0.791667	0.657233	0.791667	0.221429
logistic regression synthetic samples	0.544554	0.6	0.522727	0.704082	0.522727	0.585714
logistic regression upsampled	0.539604	0.609244	0.549242	0.683962	0.549242	0.521429
knn 10	0.559406	0.6787	0.712121	0.648276	0.712121	0.271429
knn 10 synthetic samples	0.492574	0.526559	0.431818	0.674556	0.431818	0.607143
knn 10 upsampled	0.522277	0.61167	0.575758	0.652361	0.575758	0.421429

TABLE CLXXVIII: Numerical results of ML methods, using data between time of birth + 18 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.542079	0.139535	0.0815217	0.483871	0.0815217	0.927273
Logistic regression synthetic samples	0.55198	0.524934	0.543478	0.507614	0.543478	0.559091
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.544554	0	0	0	0	1
svm, linear kernel, synthetic samples	0.539604	0.544118	0.603261	0.495536	0.603261	0.486364
svm, linear kernel upsampled samples	0.559406	0.494318	0.472826	0.517857	0.472826	0.631818
svm, poly	0.54703	0.0213904	0.0108696	0.666667	0.0108696	0.995455
svm, poly synthetic samples	0.542079	0.554217	0.625	0.497835	0.625	0.472727
svm, poly upsampled	0.544554	0.486034	0.472826	0.5	0.472826	0.604545
grid, rbf kernel	0.539604	0.0106383	0.00543478	0.25	0.00543478	0.986364
grid, rbf kernel synthetic samples	0.544554	0.532995	0.570652	0.5	0.570652	0.522727
grid, rbf kernel upsampled	0.50495	0.489796	0.521739	0.461538	0.521739	0.490909
grid, sigmoid kernel	0.527228	0.127854	0.076087	0.4	0.076087	0.904545
grid, sigmoid kernel synthetic samples	0.524752	0.463687	0.451087	0.477011	0.451087	0.586364
grid, sigmoid kernel upsampled	0.509901	0.494898	0.527174	0.466346	0.527174	0.495455
random forest estimator	0.532178	0.112676	0.0652174	0.413793	0.0652174	0.922727
random forest estimator synthetic samples	0.571782	0.45768	0.396739	0.540741	0.396739	0.718182
random forest estimator, upsampled	0.502475	0.537931	0.63587	0.466135	0.63587	0.390909
logistic regression	0.544554	0.163636	0.0978261	0.5	0.0978261	0.918182
logistic regression synthetic samples	0.55198	0.524934	0.543478	0.507614	0.543478	0.559091
logistic regression upsampled	0.561881	0.515068	0.51087	0.519337	0.51087	0.604545
knn 10	0.539604	0.375839	0.304348	0.491228	0.304348	0.736364
knn 10 synthetic samples	0.554455	0.545455	0.586957	0.509434	0.586957	0.527273
knn 10 upsampled	0.532178	0.511628	0.538043	0.487685	0.538043	0.527273

TABLE CLXXIX: Numerical results of ML methods, using data between time of birth + 18 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.829146	0.906593	0.988024	0.837563	0.988024	0
Logistic regression synthetic samples	0.484925	0.603482	0.467066	0.852459	0.467066	0.578125
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.839196	0.912568	1	0.839196	1	0
svm, linear kernel, synthetic samples	0.432161	0.53112	0.383234	0.864865	0.383234	0.6875
svm, linear kernel upsampled samples	0.457286	0.579767	0.446108	0.827778	0.446108	0.515625
svm, poly	0.834171	0.909589	0.994012	0.838384	0.994012	0
svm, poly synthetic samples	0.447236	0.56	0.419162	0.843373	0.419162	0.59375
svm, poly upsampled	0.535176	0.670232	0.562874	0.828194	0.562874	0.390625
grid, rbf kernel	0.839196	0.912568	1	0.839196	1	0
grid, rbf kernel synthetic samples	0.525126	0.656987	0.541916	0.834101	0.541916	0.4375
grid, rbf kernel upsampled	0.635678	0.759536	0.685629	0.851301	0.685629	0.375
grid, sigmoid kernel	0.821608	0.901526	0.973054	0.839793	0.973054	0.03125
grid, sigmoid kernel synthetic samples	0.497487	0.621212	0.491018	0.845361	0.491018	0.53125
grid, sigmoid kernel upsampled	0.474874	0.600382	0.47006	0.830688	0.47006	0.5
random forest estimator	0.839196	0.912568	1	0.839196	1	0
random forest estimator synthetic samples	0.635678	0.768	0.718563	0.824742	0.718563	0.203125
random forest estimator, upsampled	0.743719	0.847761	0.850299	0.845238	0.850299	0.1875
logistic regression	0.829146	0.906593	0.988024	0.837563	0.988024	0
logistic regression synthetic samples	0.484925	0.603482	0.467066	0.852459	0.467066	0.578125
logistic regression upsampled	0.542714	0.662963	0.535928	0.868932	0.535928	0.578125
knn 10	0.811558	0.895105	0.958084	0.839895	0.958084	0.046875
knn 10 synthetic samples	0.487437	0.610687	0.479042	0.842105	0.479042	0.53125
knn 10 upsampled	0.555276	0.691099	0.592814	0.828452	0.592814	0.359375

TABLE CLXXX: Numerical results of ML methods, using data between time of birth + 19 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.61809	0.752443	0.905882	0.643454	0.905882	0.104895
Logistic regression synthetic samples	0.545226	0.615711	0.568627	0.671296	0.568627	0.503497
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.640704	0.781011	1	0.640704	1	0
svm, linear kernel, synthetic samples	0.562814	0.626609	0.572549	0.691943	0.572549	0.545455
svm, linear kernel upsampled samples	0.560302	0.611973	0.541176	0.704082	0.541176	0.594406
svm, poly	0.645729	0.781395	0.988235	0.646154	0.988235	0.034965
svm, poly synthetic samples	0.545226	0.641584	0.635294	0.648	0.635294	0.384615
svm, poly upsampled	0.567839	0.653226	0.635294	0.672199	0.635294	0.447552
grid, rbf kernel	0.635678	0.77237	0.964706	0.643979	0.964706	0.048951
grid, rbf kernel synthetic samples	0.550251	0.644135	0.635294	0.653226	0.635294	0.398601
grid, rbf kernel upsampled	0.572864	0.675573	0.694118	0.657993	0.694118	0.356643
grid, sigmoid kernel	0.630653	0.764045	0.933333	0.646739	0.933333	0.0909091
grid, sigmoid kernel synthetic samples	0.547739	0.635628	0.615686	0.656904	0.615686	0.426573
grid, sigmoid kernel upsampled	0.505025	0.557303	0.486275	0.652632	0.486275	0.538462
random forest estimator	0.628141	0.758958	0.913725	0.649025	0.913725	0.118881
random forest estimator synthetic samples	0.547739	0.644269	0.639216	0.649402	0.639216	0.384615
random forest estimator, upsampled	0.600503	0.709324	0.760784	0.664384	0.760784	0.314685
logistic regression	0.623116	0.754098	0.901961	0.647887	0.901961	0.125874
logistic regression synthetic samples	0.545226	0.615711	0.568627	0.671296	0.568627	0.503497
logistic regression upsampled	0.570352	0.632258	0.576471	0.7	0.576471	0.559441
knn 10	0.550251	0.679785	0.745098	0.625	0.745098	0.202797
knn 10 synthetic samples	0.494975	0.544218	0.470588	0.645161	0.470588	0.538462
knn 10 upsampled	0.525126	0.618182	0.6	0.6375	0.6	0.391608

TABLE CLXXXI: Numerical results of ML methods, using data between time of birth + 19 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.560302	0.178404	0.113095	0.422222	0.113095	0.886957
Logistic regression synthetic samples	0.517588	0.51269	0.60119	0.446903	0.60119	0.456522
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.572864	0	0	0	0	0.991304
svm, linear kernel, synthetic samples	0.487437	0.546667	0.732143	0.43617	0.732143	0.308696
svm, linear kernel upsampled samples	0.482412	0.485	0.577381	0.418103	0.577381	0.413043
svm, poly	0.570352	0.0228571	0.0119048	0.285714	0.0119048	0.978261
svm, poly synthetic samples	0.484925	0.547461	0.738095	0.435088	0.738095	0.3
svm, poly upsampled	0.459799	0.486874	0.607143	0.406375	0.607143	0.352174
grid, rbf kernel	0.570352	0.0228571	0.0119048	0.285714	0.0119048	0.978261
grid, rbf kernel synthetic samples	0.507538	0.512438	0.613095	0.440171	0.613095	0.430435
grid, rbf kernel upsampled	0.51005	0.501279	0.583333	0.439462	0.583333	0.456522
grid, sigmoid kernel	0.572864	0.0555556	0.0297619	0.416667	0.0297619	0.969565
grid, sigmoid kernel synthetic samples	0.515075	0.562358	0.738095	0.454212	0.738095	0.352174
grid, sigmoid kernel upsampled	0.492462	0.473958	0.541667	0.421296	0.541667	0.456522
random forest estimator	0.552764	0.118812	0.0714286	0.352941	0.0714286	0.904348
random forest estimator synthetic samples	0.542714	0.405229	0.369048	0.449275	0.369048	0.669565
random forest estimator, upsampled	0.497487	0.526066	0.660714	0.437008	0.660714	0.378261
logistic regression	0.567839	0.225225	0.14881	0.462963	0.14881	0.873913
logistic regression synthetic samples	0.517588	0.51269	0.60119	0.446903	0.60119	0.456522
logistic regression upsampled	0.520101	0.485175	0.535714	0.44335	0.535714	0.508696
knn 10	0.567839	0.390071	0.327381	0.482456	0.327381	0.743478
knn 10 synthetic samples	0.484925	0.470284	0.541667	0.415525	0.541667	0.443478
knn 10 upsampled	0.550251	0.509589	0.553571	0.472081	0.553571	0.547826

TABLE CLXXXII: Numerical results of ML methods, using data between time of birth + 19 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.804569	0.891702	0.996855	0.806616	0.996855	0
Logistic regression synthetic samples	0.540609	0.659134	0.550314	0.821596	0.550314	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.807107	0.893258	1	0.807107	1	0
svm, linear kernel, synthetic samples	0.484772	0.591549	0.462264	0.821229	0.462264	0.578947
svm, linear kernel upsampled samples	0.497462	0.619231	0.506289	0.79703	0.506289	0.460526
svm, poly	0.807107	0.893258	1	0.807107	1	0
svm, poly synthetic samples	0.482234	0.592	0.465409	0.813187	0.465409	0.552632
svm, poly upsampled	0.548223	0.676364	0.584906	0.801724	0.584906	0.394737
grid, rbf kernel	0.807107	0.893258	1	0.807107	1	0
grid, rbf kernel synthetic samples	0.530457	0.647619	0.534591	0.821256	0.534591	0.513158
grid, rbf kernel upsampled	0.621827	0.746167	0.688679	0.814126	0.688679	0.342105
grid, sigmoid kernel	0.77665	0.874286	0.962264	0.801047	0.962264	0
grid, sigmoid kernel synthetic samples	0.477157	0.600775	0.487421	0.782828	0.487421	0.434211
grid, sigmoid kernel upsampled	0.515228	0.640301	0.534591	0.798122	0.534591	0.434211
random forest estimator	0.807107	0.893258	1	0.807107	1	0
random forest estimator synthetic samples	0.687817	0.809302	0.820755	0.798165	0.820755	0.131579
random forest estimator, upsampled	0.746193	0.853372	0.915094	0.799451	0.915094	0.0394737
logistic regression	0.804569	0.891702	0.996855	0.806616	0.996855	0
logistic regression synthetic samples	0.540609	0.659134	0.550314	0.821596	0.550314	0.5
logistic regression upsampled	0.538071	0.662963	0.562893	0.806306	0.562893	0.434211
knn 10	0.80203	0.889205	0.984277	0.810881	0.984277	0.0394737
knn 10 synthetic samples	0.517766	0.624506	0.496855	0.840426	0.496855	0.605263
knn 10 upsampled	0.611675	0.730159	0.650943	0.831325	0.650943	0.447368

TABLE CLXXXIII: Numerical results of ML methods, using data between time of birth + 20 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.576142	0.72213	0.904167	0.601108	0.904167	0.0649351
Logistic regression synthetic samples	0.507614	0.548837	0.491667	0.621053	0.491667	0.532468
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.609137	0.757098	1	0.609137	1	0
svm, linear kernel, synthetic samples	0.489848	0.524823	0.4625	0.606557	0.4625	0.532468
svm, linear kernel upsampled samples	0.482234	0.518868	0.458333	0.597826	0.458333	0.519481
svm, poly	0.601523	0.7488	0.975	0.607792	0.975	0.0194805
svm, poly synthetic samples	0.510152	0.548009	0.4875	0.625668	0.4875	0.545455
svm, poly upsampled	0.494924	0.558758	0.525	0.597156	0.525	0.448052
grid, rbf kernel	0.611675	0.758294	1	0.610687	1	0.00649351
grid, rbf kernel synthetic samples	0.520305	0.591793	0.570833	0.61435	0.570833	0.441558
grid, rbf kernel upsampled	0.535533	0.609808	0.595833	0.624454	0.595833	0.441558
grid, sigmoid kernel	0.611675	0.754414	0.979167	0.613577	0.979167	0.038961
grid, sigmoid kernel synthetic samples	0.510152	0.568233	0.529167	0.613527	0.529167	0.480519
grid, sigmoid kernel upsampled	0.507614	0.535885	0.466667	0.629213	0.466667	0.571429
random forest estimator	0.609137	0.746711	0.945833	0.616848	0.945833	0.0844156
random forest estimator synthetic samples	0.532995	0.618257	0.620833	0.615702	0.620833	0.396104
random forest estimator, upsampled	0.535533	0.654064	0.720833	0.598616	0.720833	0.246753
logistic regression	0.571066	0.717863	0.895833	0.598886	0.895833	0.0649351
logistic regression synthetic samples	0.507614	0.548837	0.491667	0.621053	0.491667	0.532468
logistic regression upsampled	0.497462	0.537383	0.479167	0.611702	0.479167	0.525974
knn 10	0.588832	0.708633	0.820833	0.623418	0.820833	0.227273
knn 10 synthetic samples	0.507614	0.555046	0.504167	0.617347	0.504167	0.512987
knn 10 upsampled	0.507614	0.576419	0.55	0.605505	0.55	0.441558

TABLE CLXXXIV: Numerical results of ML methods, using data between time of birth + 20 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.530457	0.177778	0.11976	0.344828	0.11976	0.832599
Logistic regression synthetic samples	0.538071	0.52356	0.598802	0.465116	0.598802	0.493392
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.576142	0	0	0	0	1
svm, linear kernel, synthetic samples	0.51269	0.533981	0.658683	0.44898	0.658683	0.405286
svm, linear kernel upsampled samples	0.482234	0.504854	0.622754	0.42449	0.622754	0.378855
svm, poly	0.57868	0.0119048	0.00598802	1	0.00598802	1
svm, poly synthetic samples	0.489848	0.510949	0.628743	0.430328	0.628743	0.387665
svm, poly upsampled	0.505076	0.518519	0.628743	0.441176	0.628743	0.414097
grid, rbf kernel	0.57868	0.045977	0.0239521	0.571429	0.0239521	0.986784
grid, rbf kernel synthetic samples	0.510152	0.482574	0.538922	0.436893	0.538922	0.488987
grid, rbf kernel upsampled	0.517766	0.507772	0.586826	0.447489	0.586826	0.46696
grid, sigmoid kernel	0.576142	0.251121	0.167665	0.5	0.167665	0.876652
grid, sigmoid kernel synthetic samples	0.532995	0.510638	0.57485	0.45933	0.57485	0.502203
grid, sigmoid kernel upsampled	0.527919	0.477528	0.508982	0.449735	0.508982	0.54185
random forest estimator	0.576142	0.244344	0.161677	0.5	0.161677	0.881057
random forest estimator synthetic samples	0.510152	0.437318	0.449102	0.426136	0.449102	0.555066
random forest estimator, upsampled	0.467005	0.50237	0.634731	0.415686	0.634731	0.343612
logistic regression	0.558376	0.243478	0.167665	0.444444	0.167665	0.845815
logistic regression synthetic samples	0.538071	0.52356	0.598802	0.465116	0.598802	0.493392
logistic regression upsampled	0.510152	0.493438	0.562874	0.439252	0.562874	0.471366
knn 10	0.568528	0.440789	0.401198	0.489051	0.401198	0.69163
knn 10 synthetic samples	0.510152	0.488064	0.550898	0.438095	0.550898	0.480176
knn 10 upsampled	0.532995	0.513228	0.580838	0.459716	0.580838	0.497797

TABLE CLXXXV: Numerical results of ML methods, using data between time of birth + 20 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.804627	0.891738	0.996815	0.806701	0.996815	0
Logistic regression synthetic samples	0.508997	0.629126	0.515924	0.80597	0.515924	0.48
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.807198	0.893314	1	0.807198	1	0
svm, linear kernel, synthetic samples	0.44473	0.542373	0.407643	0.810127	0.407643	0.6
svm, linear kernel upsampled samples	0.498715	0.610778	0.487261	0.818182	0.487261	0.546667
svm, poly	0.804627	0.891738	0.996815	0.806701	0.996815	0
svm, poly synthetic samples	0.470437	0.572614	0.43949	0.821429	0.43949	0.6
svm, poly upsampled	0.547558	0.661538	0.547771	0.834951	0.547771	0.546667
grid, rbf kernel	0.807198	0.893314	1	0.807198	1	0
grid, rbf kernel synthetic samples	0.529563	0.651429	0.544586	0.810427	0.544586	0.466667
grid, rbf kernel upsampled	0.596401	0.715064	0.627389	0.831224	0.627389	0.466667
grid, sigmoid kernel	0.802057	0.888889	0.980892	0.812665	0.980892	0.0533333
grid, sigmoid kernel synthetic samples	0.465296	0.580645	0.458599	0.791209	0.458599	0.493333
grid, sigmoid kernel upsampled	0.470437	0.586345	0.464968	0.793478	0.464968	0.493333
random forest estimator	0.807198	0.893314	1	0.807198	1	0
random forest estimator synthetic samples	0.686375	0.804487	0.799363	0.809677	0.799363	0.213333
random forest estimator, upsampled	0.773779	0.869048	0.929936	0.815642	0.929936	0.12
logistic regression	0.804627	0.891429	0.993631	0.80829	0.993631	0.0133333
logistic regression synthetic samples	0.508997	0.629126	0.515924	0.80597	0.515924	0.48
logistic regression upsampled	0.568123	0.680608	0.570064	0.84434	0.570064	0.56
knn 10	0.786632	0.880576	0.974522	0.80315	0.974522	0
knn 10 synthetic samples	0.496144	0.603239	0.474522	0.827778	0.474522	0.586667
knn 10 upsampled	0.562982	0.67803	0.570064	0.836449	0.570064	0.533333

TABLE CLXXXVI: Numerical results of ML methods, using data between time of birth + 21 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.640103	0.771987	0.959514	0.645777	0.959514	0.084507
Logistic regression synthetic samples	0.570694	0.626398	0.566802	0.7	0.566802	0.577465
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.634961	0.77673	1	0.634961	1	0
svm, linear kernel, synthetic samples	0.539846	0.568675	0.477733	0.702381	0.477733	0.647887
svm, linear kernel upsampled samples	0.562982	0.613636	0.546559	0.699482	0.546559	0.591549
svm, poly	0.642674	0.780411	1	0.639896	1	0.0211268
svm, poly synthetic samples	0.503856	0.528117	0.437247	0.666667	0.437247	0.619718
svm, poly upsampled	0.560411	0.636943	0.607287	0.669643	0.607287	0.478873
grid, rbf kernel	0.640103	0.77918	1	0.638243	1	0.0140845
grid, rbf kernel synthetic samples	0.560411	0.613995	0.550607	0.693878	0.550607	0.577465
grid, rbf kernel upsampled	0.539846	0.642715	0.651822	0.633858	0.651822	0.34507
grid, sigmoid kernel	0.627249	0.768	0.97166	0.634921	0.97166	0.028169
grid, sigmoid kernel synthetic samples	0.568123	0.621622	0.558704	0.700508	0.558704	0.584507
grid, sigmoid kernel upsampled	0.55527	0.616408	0.562753	0.681373	0.562753	0.542254
random forest estimator	0.622108	0.753769	0.910931	0.642857	0.910931	0.119718
random forest estimator synthetic samples	0.55527	0.656064	0.668016	0.644531	0.668016	0.359155
random forest estimator, upsampled	0.59383	0.714801	0.801619	0.644951	0.801619	0.232394
logistic regression	0.637532	0.769231	0.951417	0.645604	0.951417	0.0915493
logistic regression synthetic samples	0.570694	0.626398	0.566802	0.7	0.566802	0.577465
logistic regression upsampled	0.562982	0.628821	0.582996	0.682464	0.582996	0.528169
knn 10	0.552699	0.678967	0.744939	0.623729	0.744939	0.21831
knn 10 synthetic samples	0.498715	0.513716	0.417004	0.668831	0.417004	0.640845
knn 10 upsampled	0.491003	0.543779	0.477733	0.631016	0.477733	0.514085

TABLE CLXXXVII: Numerical results of ML methods, using data between time of birth + 21 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.59383	0.217822	0.134969	0.564103	0.134969	0.924779
Logistic regression synthetic samples	0.550129	0.489796	0.515337	0.466667	0.515337	0.575221
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.580977	0	0	0	0	1
svm, linear kernel, synthetic samples	0.550129	0.509804	0.558282	0.469072	0.558282	0.544248
svm, linear kernel upsampled samples	0.557841	0.535135	0.607362	0.478261	0.607362	0.522124
svm, poly	0.580977	0	0	0	0	1
svm, poly synthetic samples	0.552699	0.551546	0.656442	0.475556	0.656442	0.477876
svm, poly upsampled	0.539846	0.532637	0.625767	0.463636	0.625767	0.477876
grid, rbf kernel	0.583548	0.0898876	0.0490798	0.533333	0.0490798	0.969027
grid, rbf kernel synthetic samples	0.570694	0.56168	0.656442	0.490826	0.656442	0.50885
grid, rbf kernel upsampled	0.562982	0.530387	0.588957	0.482412	0.588957	0.544248
grid, sigmoid kernel	0.586118	0.214634	0.134969	0.52381	0.134969	0.911504
grid, sigmoid kernel synthetic samples	0.547558	0.502825	0.546012	0.465969	0.546012	0.548673
grid, sigmoid kernel upsampled	0.565553	0.518519	0.558282	0.484043	0.558282	0.570796
random forest estimator	0.570694	0.134715	0.0797546	0.433333	0.0797546	0.924779
random forest estimator synthetic samples	0.529563	0.453731	0.466258	0.44186	0.466258	0.575221
random forest estimator, upsampled	0.473008	0.506024	0.644172	0.416667	0.644172	0.349558
logistic regression	0.586118	0.229665	0.147239	0.521739	0.147239	0.902655
logistic regression synthetic samples	0.552699	0.491228	0.515337	0.469274	0.515337	0.579646
logistic regression upsampled	0.570694	0.537396	0.595092	0.489899	0.595092	0.553097
knn 10	0.534704	0.378007	0.337423	0.429688	0.337423	0.676991
knn 10 synthetic samples	0.508997	0.503896	0.595092	0.436937	0.595092	0.446903
knn 10 upsampled	0.508997	0.476712	0.533742	0.430693	0.533742	0.49115

TABLE CLXXXVIII: Numerical results of ML methods, using data between time of birth + 21 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.81039	0.895265	0.996805	0.8125	0.996805	0
Logistic regression synthetic samples	0.522078	0.644788	0.533546	0.814634	0.533546	0.472222
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.812987	0.896848	1	0.812987	1	0
svm, linear kernel, synthetic samples	0.467532	0.570231	0.434505	0.829268	0.434505	0.611111
svm, linear kernel upsampled samples	0.47013	0.562232	0.41853	0.856209	0.41853	0.694444
svm, poly	0.812987	0.896848	1	0.812987	1	0
svm, poly synthetic samples	0.485714	0.597561	0.469649	0.821229	0.469649	0.555556
svm, poly upsampled	0.511688	0.626984	0.504792	0.827225	0.504792	0.541667
grid, rbf kernel	0.802597	0.889855	0.980831	0.814324	0.980831	0.0277778
grid, rbf kernel synthetic samples	0.535065	0.664165	0.565495	0.804545	0.565495	0.402778
grid, rbf kernel upsampled	0.628571	0.752166	0.693291	0.82197	0.693291	0.347222
grid, sigmoid kernel	0.78961	0.881752	0.964856	0.811828	0.964856	0.0277778
grid, sigmoid kernel synthetic samples	0.511688	0.629921	0.511182	0.820513	0.511182	0.513889
grid, sigmoid kernel upsampled	0.522078	0.642023	0.527157	0.820896	0.527157	0.5
random forest estimator	0.812987	0.896848	1	0.812987	1	0
random forest estimator synthetic samples	0.664935	0.787479	0.763578	0.812925	0.763578	0.236111
random forest estimator, upsampled	0.758442	0.858447	0.900958	0.819767	0.900958	0.138889
logistic regression	0.807792	0.893678	0.99361	0.81201	0.99361	0
logistic regression synthetic samples	0.522078	0.644788	0.533546	0.814634	0.533546	0.472222
logistic regression upsampled	0.553247	0.666667	0.549521	0.847291	0.549521	0.569444
knn 10	0.792208	0.882698	0.961661	0.815718	0.961661	0.0555556
knn 10 synthetic samples	0.483117	0.59798	0.472843	0.813187	0.472843	0.527778
knn 10 upsampled	0.58961	0.707407	0.610224	0.84141	0.610224	0.5

TABLE CLXXXIX: Numerical results of ML methods, using data between time of birth + 22 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.618182	0.752941	0.910569	0.641834	0.910569	0.100719
Logistic regression synthetic samples	0.519481	0.595186	0.552846	0.64455	0.552846	0.460432
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.628571	0.768982	0.96748	0.63807	0.96748	0.028777
svm, linear kernel, synthetic samples	0.524675	0.588764	0.53252	0.658291	0.53252	0.510791
svm, linear kernel upsampled samples	0.537662	0.613043	0.573171	0.658879	0.573171	0.47482
svm, poly	0.628571	0.769726	0.971545	0.637333	0.971545	0.0215827
svm, poly synthetic samples	0.527273	0.607759	0.573171	0.646789	0.573171	0.446043
svm, poly upsampled	0.522078	0.610169	0.585366	0.637168	0.585366	0.410072
grid, rbf kernel	0.628571	0.769726	0.971545	0.637333	0.971545	0.0215827
grid, rbf kernel synthetic samples	0.522078	0.601732	0.565041	0.643519	0.565041	0.446043
grid, rbf kernel upsampled	0.555844	0.644491	0.630081	0.659574	0.630081	0.42446
grid, sigmoid kernel	0.618182	0.76175	0.955285	0.633423	0.955285	0.0215827
grid, sigmoid kernel synthetic samples	0.535065	0.578824	0.5	0.687151	0.5	0.597122
grid, sigmoid kernel upsampled	0.522078	0.570093	0.495935	0.67033	0.495935	0.568345
random forest estimator	0.631169	0.767213	0.95122	0.642857	0.95122	0.0647482
random forest estimator synthetic samples	0.545455	0.652087	0.666667	0.638132	0.666667	0.330935
random forest estimator, upsampled	0.584416	0.704797	0.776423	0.64527	0.776423	0.244604
logistic regression	0.620779	0.752542	0.902439	0.645349	0.902439	0.122302
logistic regression synthetic samples	0.519481	0.595186	0.552846	0.64455	0.552846	0.460432
logistic regression upsampled	0.516883	0.592105	0.54878	0.642857	0.54878	0.460432
knn 10	0.558442	0.679245	0.731707	0.633803	0.731707	0.251799
knn 10 synthetic samples	0.493506	0.549654	0.48374	0.636364	0.48374	0.510791
knn 10 upsampled	0.527273	0.616034	0.593496	0.640351	0.593496	0.410072

TABLE CXC: Numerical results of ML methods, using data between time of birth + 22 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.581818	0.278027	0.192547	0.5	0.192547	0.861607
Logistic regression synthetic samples	0.532468	0.485714	0.52795	0.449735	0.52795	0.535714
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.581818	0	0	0	0	1
svm, linear kernel, synthetic samples	0.519481	0.506667	0.590062	0.443925	0.590062	0.46875
svm, linear kernel upsampled samples	0.503896	0.464986	0.515528	0.423469	0.515528	0.495536
svm, poly	0.581818	0	0	0	0	1
svm, poly synthetic samples	0.496104	0.535885	0.695652	0.435798	0.695652	0.352679
svm, poly upsampled	0.480519	0.492386	0.602484	0.416309	0.602484	0.392857
grid, rbf kernel	0.587013	0.0809249	0.0434783	0.583333	0.0434783	0.977679
grid, rbf kernel synthetic samples	0.493506	0.516129	0.645963	0.429752	0.645963	0.383929
grid, rbf kernel upsampled	0.485714	0.487047	0.583851	0.417778	0.583851	0.415179
grid, sigmoid kernel	0.576623	0.227488	0.149068	0.48	0.149068	0.883929
grid, sigmoid kernel synthetic samples	0.514286	0.448378	0.47205	0.426966	0.47205	0.544643
grid, sigmoid kernel upsampled	0.52987	0.490141	0.540373	0.448454	0.540373	0.522321
random forest estimator	0.579221	0.205882	0.130435	0.488372	0.130435	0.901786
random forest estimator synthetic samples	0.514286	0.441791	0.459627	0.425287	0.459627	0.553571
random forest estimator, upsampled	0.464935	0.5	0.639752	0.410359	0.639752	0.339286
logistic regression	0.568831	0.27193	0.192547	0.462687	0.192547	0.839286
logistic regression synthetic samples	0.532468	0.485714	0.52795	0.449735	0.52795	0.535714
logistic regression upsampled	0.52987	0.501377	0.565217	0.450495	0.565217	0.504464
knn 10	0.548052	0.374101	0.322981	0.444444	0.322981	0.709821
knn 10 synthetic samples	0.506494	0.472222	0.52795	0.427136	0.52795	0.491071
knn 10 upsampled	0.493506	0.453782	0.503106	0.413265	0.503106	0.486607

TABLE CXCI: Numerical results of ML methods, using data between time of birth + 22 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.813648	0.896952	0.990385	0.819629	0.990385	0.0144928
Logistic regression synthetic samples	0.52231	0.651341	0.544872	0.809524	0.544872	0.42029
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.818898	0.900433	1	0.818898	1	0
svm, linear kernel, synthetic samples	0.472441	0.580376	0.445513	0.832335	0.445513	0.594203
svm, linear kernel upsampled samples	0.498688	0.615694	0.490385	0.827027	0.490385	0.536232
svm, poly	0.818898	0.900433	1	0.818898	1	0
svm, poly synthetic samples	0.451444	0.563674	0.432692	0.808383	0.432692	0.536232
svm, poly upsampled	0.464567	0.587045	0.464744	0.796703	0.464744	0.463768
grid, rbf kernel	0.818898	0.900433	1	0.818898	1	0
grid, rbf kernel synthetic samples	0.532808	0.660305	0.554487	0.816038	0.554487	0.434783
grid, rbf kernel upsampled	0.587927	0.721137	0.650641	0.808765	0.650641	0.304348
grid, sigmoid kernel	0.787402	0.879643	0.948718	0.819945	0.948718	0.057971
grid, sigmoid kernel synthetic samples	0.480315	0.590909	0.458333	0.831395	0.458333	0.57971
grid, sigmoid kernel upsampled	0.448819	0.556962	0.423077	0.814815	0.423077	0.565217
random forest estimator	0.818898	0.900433	1	0.818898	1	0
random forest estimator synthetic samples	0.664042	0.786667	0.75641	0.819444	0.75641	0.246377
random forest estimator, upsampled	0.75853	0.860606	0.910256	0.816092	0.910256	0.0724638
logistic regression	0.813648	0.896952	0.990385	0.819629	0.990385	0.0144928
logistic regression synthetic samples	0.52231	0.651341	0.544872	0.809524	0.544872	0.42029
logistic regression upsampled	0.519685	0.646035	0.535256	0.814634	0.535256	0.449275
knn 10	0.7979	0.886931	0.967949	0.818428	0.967949	0.0289855
knn 10 synthetic samples	0.467192	0.577963	0.445513	0.822485	0.445513	0.565217
knn 10 upsampled	0.530184	0.660342	0.557692	0.809302	0.557692	0.405797

TABLE CXCII: Numerical results of ML methods, using data between time of birth + 23 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.608924	0.752902	0.957806	0.620219	0.957806	0.0347222
Logistic regression synthetic samples	0.519685	0.581236	0.535865	0.635	0.535865	0.493056
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.619423	0.762684	0.983122	0.622995	0.983122	0.0208333
svm, linear kernel, synthetic samples	0.501312	0.53202	0.455696	0.639053	0.455696	0.576389
svm, linear kernel upsampled samples	0.506562	0.58952	0.56962	0.61086	0.56962	0.402778
svm, poly	0.627297	0.766447	0.983122	0.628032	0.983122	0.0416667
svm, poly synthetic samples	0.519685	0.554745	0.481013	0.655172	0.481013	0.583333
svm, poly upsampled	0.52231	0.607759	0.594937	0.621145	0.594937	0.402778
grid, rbf kernel	0.627297	0.767974	0.991561	0.626667	0.991561	0.0277778
grid, rbf kernel synthetic samples	0.496063	0.563636	0.523207	0.610837	0.523207	0.451389
grid, rbf kernel upsampled	0.548556	0.644628	0.658228	0.631579	0.658228	0.368056
grid, sigmoid kernel	0.622047	0.758389	0.953586	0.629526	0.953586	0.0763889
grid, sigmoid kernel synthetic samples	0.498688	0.53528	0.464135	0.632184	0.464135	0.555556
grid, sigmoid kernel upsampled	0.55643	0.642706	0.64135	0.644068	0.64135	0.416667
random forest estimator	0.627297	0.763333	0.966245	0.630854	0.966245	0.0694444
random forest estimator synthetic samples	0.566929	0.648188	0.64135	0.655172	0.64135	0.444444
random forest estimator, upsampled	0.60105	0.712121	0.793249	0.646048	0.793249	0.284722
logistic regression	0.60105	0.746667	0.945148	0.61708	0.945148	0.0347222
logistic regression synthetic samples	0.519685	0.581236	0.535865	0.635	0.535865	0.493056
logistic regression upsampled	0.530184	0.606593	0.582278	0.633028	0.582278	0.444444
knn 10	0.582677	0.694818	0.763713	0.637324	0.763713	0.284722
knn 10 synthetic samples	0.530184	0.566586	0.493671	0.664773	0.493671	0.590278
knn 10 upsampled	0.51706	0.577982	0.531646	0.633166	0.531646	0.493056

TABLE CXCIII: Numerical results of ML methods, using data between time of birth + 23 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.551181	0.226244	0.154321	0.423729	0.154321	0.844749
Logistic regression synthetic samples	0.519685	0.49863	0.561728	0.448276	0.561728	0.488584
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.569554	0.0238095	0.0123457	0.333333	0.0123457	0.981735
svm, linear kernel, synthetic samples	0.496063	0.463687	0.512346	0.423469	0.512346	0.484018
svm, linear kernel upsampled samples	0.540682	0.474474	0.487654	0.461988	0.487654	0.579909
svm, poly	0.577428	0.0473373	0.0246914	0.571429	0.0246914	0.986301
svm, poly synthetic samples	0.503937	0.467606	0.512346	0.430052	0.512346	0.497717
svm, poly upsampled	0.532808	0.491429	0.530864	0.457447	0.530864	0.534247
grid, rbf kernel	0.577428	0.0584795	0.0308642	0.555556	0.0308642	0.981735
grid, rbf kernel synthetic samples	0.501312	0.491979	0.567901	0.433962	0.567901	0.452055
grid, rbf kernel upsampled	0.51706	0.5	0.567901	0.446602	0.567901	0.479452
grid, sigmoid kernel	0.56168	0.152284	0.0925926	0.428571	0.0925926	0.908676
grid, sigmoid kernel synthetic samples	0.52231	0.49162	0.54321	0.44898	0.54321	0.506849
grid, sigmoid kernel upsampled	0.514436	0.423676	0.419753	0.427673	0.419753	0.584475
random forest estimator	0.551181	0.173913	0.111111	0.4	0.111111	0.876712
random forest estimator synthetic samples	0.503937	0.425532	0.432099	0.419162	0.432099	0.557078
random forest estimator, upsampled	0.47769	0.498741	0.611111	0.421277	0.611111	0.378995
logistic regression	0.545932	0.224215	0.154321	0.409836	0.154321	0.835616
logistic regression synthetic samples	0.519685	0.49863	0.561728	0.448276	0.561728	0.488584
logistic regression upsampled	0.543307	0.52973	0.604938	0.471154	0.604938	0.497717
knn 10	0.527559	0.357143	0.308642	0.423729	0.308642	0.689498
knn 10 synthetic samples	0.498688	0.467967	0.518519	0.426396	0.518519	0.484018
knn 10 upsampled	0.501312	0.450867	0.481481	0.423913	0.481481	0.515982

TABLE CXCIV: Numerical results of ML methods, using data between time of birth + 23 hours to first measurement ph = 7.3 APGAR = 6

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.805263	0.892128	0.990291	0.811671	0.990291	0
Logistic regression synthetic samples	0.489474	0.595833	0.462783	0.836257	0.462783	0.605634
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.813158	0.896952	1	0.813158	1	0
svm, linear kernel, synthetic samples	0.465789	0.569002	0.433657	0.82716	0.433657	0.605634
svm, linear kernel upsampled samples	0.471053	0.569593	0.430421	0.841772	0.430421	0.647887
svm, poly	0.813158	0.896952	1	0.813158	1	0
svm, poly synthetic samples	0.442105	0.543103	0.407767	0.812903	0.407767	0.591549
svm, poly upsampled	0.536842	0.648	0.524272	0.848168	0.524272	0.591549
grid, rbf kernel	0.813158	0.896952	1	0.813158	1	0
grid, rbf kernel synthetic samples	0.484211	0.601626	0.478964	0.808743	0.478964	0.507042
grid, rbf kernel upsampled	0.589474	0.713235	0.627832	0.825532	0.627832	0.422535
grid, sigmoid kernel	0.789474	0.881306	0.961165	0.813699	0.961165	0.0422535
grid, sigmoid kernel synthetic samples	0.481579	0.595483	0.469256	0.814607	0.469256	0.535211
grid, sigmoid kernel upsampled	0.471053	0.597194	0.482201	0.784211	0.482201	0.422535
random forest estimator	0.813158	0.896952	1	0.813158	1	0
random forest estimator synthetic samples	0.65	0.777219	0.750809	0.805556	0.750809	0.211268
random forest estimator, upsampled	0.752632	0.854489	0.893204	0.818991	0.893204	0.140845
logistic regression	0.802632	0.890511	0.987055	0.81117	0.987055	0
logistic regression synthetic samples	0.489474	0.595833	0.462783	0.836257	0.462783	0.605634
logistic regression upsampled	0.518421	0.631791	0.508091	0.835106	0.508091	0.56338
knn 10	0.781579	0.877037	0.957929	0.808743	0.957929	0.0140845
knn 10 synthetic samples	0.489474	0.605691	0.482201	0.814208	0.482201	0.521127
knn 10 upsampled	0.542105	0.671698	0.576052	0.80543	0.576052	0.394366

TABLE CXCV: Numerical results of ML methods, using data between time of birth + 24 hours to first measurement ph = 7.2 APGAR = 3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.613158	0.746114	0.927039	0.624277	0.927039	0.115646
Logistic regression synthetic samples	0.536842	0.570732	0.502146	0.661017	0.502146	0.591837
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.613158	0.760196	1	0.613158	1	0
svm, linear kernel, synthetic samples	0.528947	0.542199	0.454936	0.670886	0.454936	0.646259
svm, linear kernel upsampled samples	0.534211	0.549618	0.463519	0.675	0.463519	0.646259
svm, poly	0.615789	0.759076	0.987124	0.616622	0.987124	0.0272109
svm, poly synthetic samples	0.510526	0.537313	0.463519	0.639053	0.463519	0.585034
svm, poly upsampled	0.539474	0.588235	0.536481	0.651042	0.536481	0.544218
grid, rbf kernel	0.618421	0.761905	0.995708	0.617021	0.995708	0.0204082
grid, rbf kernel synthetic samples	0.542105	0.593458	0.545064	0.651282	0.545064	0.537415
grid, rbf kernel upsampled	0.552632	0.617117	0.587983	0.649289	0.587983	0.496599
grid, sigmoid kernel	0.584211	0.728522	0.909871	0.60745	0.909871	0.0680272
grid, sigmoid kernel synthetic samples	0.494737	0.538462	0.480687	0.612022	0.480687	0.517007
grid, sigmoid kernel upsampled	0.513158	0.566745	0.519313	0.623711	0.519313	0.503401
random forest estimator	0.615789	0.753378	0.957082	0.62117	0.957082	0.0748299
random forest estimator synthetic samples	0.544737	0.623094	0.613734	0.632743	0.613734	0.435374
random forest estimator, upsampled	0.571053	0.691871	0.785408	0.618243	0.785408	0.231293
logistic regression	0.6	0.732394	0.892704	0.620896	0.892704	0.136054
logistic regression synthetic samples	0.536842	0.570732	0.502146	0.661017	0.502146	0.591837
logistic regression upsampled	0.542105	0.593458	0.545064	0.651282	0.545064	0.537415
knn 10	0.610526	0.728938	0.854077	0.635783	0.854077	0.22449
knn 10 synthetic samples	0.565789	0.59854	0.527897	0.691011	0.527897	0.62585
knn 10 upsampled	0.578947	0.633028	0.592275	0.679803	0.592275	0.557823

TABLE CXCVI: Numerical results of ML methods, using data between time of birth + 24 hours to first measurement ph = 7.25 APGAR = 5

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
upsampled log regression	0.555263	0.167488	0.108974	0.361702	0.108974	0.866071
Logistic regression synthetic samples	0.536842	0.519126	0.608974	0.452381	0.608974	0.486607
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.589474	0	0	0	0	1
svm, linear kernel, synthetic samples	0.55	0.546419	0.660256	0.466063	0.660256	0.473214
svm, linear kernel upsampled samples	0.515789	0.528205	0.660256	0.440171	0.660256	0.415179
svm, poly	0.586842	0.0368098	0.0192308	0.428571	0.0192308	0.982143
svm, poly synthetic samples	0.531579	0.548223	0.692308	0.453782	0.692308	0.419643
svm, poly upsampled	0.481579	0.515971	0.673077	0.418327	0.673077	0.348214
grid, rbf kernel	0.597368	0.0727273	0.0384615	0.666667	0.0384615	0.986607
grid, rbf kernel synthetic samples	0.497368	0.511509	0.641026	0.425532	0.641026	0.397321
grid, rbf kernel upsampled	0.494737	0.52	0.666667	0.42623	0.666667	0.375
grid, sigmoid kernel	0.589474	0.22	0.141026	0.5	0.141026	0.901786
grid, sigmoid kernel synthetic samples	0.515789	0.483146	0.551282	0.43	0.551282	0.491071
grid, sigmoid kernel upsampled	0.489474	0.451977	0.512821	0.40404	0.512821	0.473214
random forest estimator	0.581579	0.246445	0.166667	0.472727	0.166667	0.870536
random forest estimator synthetic samples	0.526316	0.423077	0.423077	0.423077	0.423077	0.598214
random forest estimator, upsampled	0.468421	0.516746	0.692308	0.412214	0.692308	0.3125
logistic regression	0.547368	0.188679	0.128205	0.357143	0.128205	0.839286
logistic regression synthetic samples	0.536842	0.519126	0.608974	0.452381	0.608974	0.486607
logistic regression upsampled	0.528947	0.51752	0.615385	0.446512	0.615385	0.46875
knn 10	0.560526	0.374532	0.320513	0.45045	0.320513	0.727679
knn 10 synthetic samples	0.539474	0.501425	0.564103	0.451282	0.564103	0.522321
knn 10 upsampled	0.571053	0.51632	0.557692	0.480663	0.557692	0.580357

TABLE CXCVII: Numerical results of ML methods, using data between time of birth + 24 hours to first measurement ph = 7.3 APGAR = 6

A. The results of classification only using analysis with pH results

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.982609	0.991228	1	0.982609	1	0
Logistic regression synthetic samples	0.756522	0.86	0.761062	0.988506	0.761062	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.982609	0.991228	1	0.982609	1	0
svm, linear kernel, synthetic samples	0.652174	0.787234	0.654867	0.986667	0.654867	0.5
svm, linear kernel upsampled samples	0.721739	0.836735	0.725664	0.987952	0.725664	0.5
svm, poly	0.982609	0.991228	1	0.982609	1	0
svm, poly synthetic samples	0.678261	0.806283	0.681416	0.987179	0.681416	0.5
svm, poly upsampled	0.773913	0.872549	0.787611	0.978022	0.787611	0
grid, rbf kernel	0.982609	0.991228	1	0.982609	1	0
grid, rbf kernel synthetic samples	0.886957	0.939535	0.893805	0.990196	0.893805	0.5
grid, rbf kernel upsampled	0.947826	0.972973	0.955752	0.990826	0.955752	0.5
grid, sigmoid kernel	0.982609	0.991228	1	0.982609	1	0
grid, sigmoid kernel synthetic samples	0.582609	0.730337	0.575221	1	0.575221	1
grid, sigmoid kernel upsampled	0.4	0.56051	0.389381	1	0.389381	1
random forest estimator	0.982609	0.991228	1	0.982609	1	0
random forest estimator synthetic samples	0.93913	0.96861	0.955752	0.981818	0.955752	0
random forest estimator, upsampled	0.982609	0.991228	1	0.982609	1	0
knn 10	0.982609	0.991228	1	0.982609	1	0
knn 10 synthetic samples	0.773913	0.871287	0.778761	0.988764	0.778761	0.5
knn 10 upsampled	0.904348	0.949309	0.911504	0.990385	0.911504	0.5

TABLE CXCVIII: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.930435	0.963636	1	0.929825	1	0.111111
Logistic regression synthetic samples	0.678261	0.802139	0.707547	0.925926	0.707547	0.333333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.921739	0.958904	0.990566	0.929204	0.990566	0.111111
svm, linear kernel, synthetic samples	0.686957	0.806452	0.707547	0.9375	0.707547	0.444444
svm, linear kernel upsampled samples	0.721739	0.833333	0.754717	0.930233	0.754717	0.333333
svm, poly	0.921739	0.958904	0.990566	0.929204	0.990566	0.111111
svm, poly synthetic samples	0.643478	0.775956	0.669811	0.922078	0.669811	0.333333
svm, poly upsampled	0.678261	0.802139	0.707547	0.925926	0.707547	0.333333
grid, rbf kernel	0.921739	0.959276	1	0.921739	1	0
grid, rbf kernel synthetic samples	0.8	0.887805	0.858491	0.919192	0.858491	0.111111
grid, rbf kernel upsampled	0.834783	0.908213	0.886792	0.930693	0.886792	0.222222
grid, sigmoid kernel	0.921739	0.959276	1	0.921739	1	0
grid, sigmoid kernel synthetic samples	0.652174	0.784946	0.688679	0.9125	0.688679	0.222222
grid, sigmoid kernel upsampled	0.617391	0.752809	0.632075	0.930556	0.632075	0.444444
random forest estimator	0.921739	0.959276	1	0.921739	1	0
random forest estimator synthetic samples	0.869565	0.92891	0.924528	0.933333	0.924528	0.222222
random forest estimator, upsampled	0.895652	0.944444	0.962264	0.927273	0.962264	0.111111
knn 10	0.930435	0.963636	1	0.929825	1	0.111111
knn 10 synthetic samples	0.66087	0.786885	0.679245	0.935065	0.679245	0.444444
knn 10 upsampled	0.704348	0.819149	0.726415	0.939024	0.726415	0.444444

TABLE CXCIX: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.713043	0.821622	0.863636	0.783505	0.863636	0.222222
Logistic regression synthetic samples	0.6	0.701299	0.613636	0.818182	0.613636	0.555556
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.730435	0.84264	0.943182	0.761468	0.943182	0.037037
svm, linear kernel, synthetic samples	0.591304	0.696774	0.613636	0.80597	0.613636	0.518519
svm, linear kernel upsampled samples	0.626087	0.732919	0.670455	0.808219	0.670455	0.481481
svm, poly	0.747826	0.854271	0.965909	0.765766	0.965909	0.037037
svm, poly synthetic samples	0.608696	0.709677	0.625	0.820896	0.625	0.555556
svm, poly upsampled	0.634783	0.740741	0.681818	0.810811	0.681818	0.481481
grid, rbf kernel	0.765217	0.865672	0.988636	0.769912	0.988636	0.037037
grid, rbf kernel synthetic samples	0.643478	0.748466	0.693182	0.813333	0.693182	0.481481
grid, rbf kernel upsampled	0.686957	0.793103	0.784091	0.802326	0.784091	0.37037
grid, sigmoid kernel	0.747826	0.855721	0.977273	0.761062	0.977273	0
grid, sigmoid kernel synthetic samples	0.6	0.708861	0.636364	0.8	0.636364	0.481481
grid, sigmoid kernel upsampled	0.608696	0.713376	0.636364	0.811594	0.636364	0.518519
random forest estimator	0.773913	0.867347	0.965909	0.787037	0.965909	0.148148
random forest estimator synthetic samples	0.6	0.708861	0.636364	0.8	0.636364	0.481481
random forest estimator, upsampled	0.713043	0.8	0.75	0.857143	0.75	0.592593
knn 10	0.773913	0.861702	0.920455	0.81	0.920455	0.296296
knn 10 synthetic samples	0.582609	0.671233	0.556818	0.844828	0.556818	0.666667
knn 10 upsampled	0.582609	0.688312	0.602273	0.80303	0.602273	0.518519

TABLE CC: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.652174	0.661017	0.619048	0.709091	0.619048	0.692308
Logistic regression synthetic samples	0.669565	0.660714	0.587302	0.755102	0.587302	0.769231
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.643478	0.672	0.666667	0.677419	0.666667	0.615385
svm, linear kernel, synthetic samples	0.652174	0.666667	0.634921	0.701754	0.634921	0.673077
svm, linear kernel upsampled samples	0.678261	0.683761	0.634921	0.740741	0.634921	0.730769
svm, poly	0.686957	0.71875	0.730159	0.707692	0.730159	0.634615
svm, poly synthetic samples	0.704348	0.730159	0.730159	0.730159	0.730159	0.673077
svm, poly upsampled	0.686957	0.704918	0.68254	0.728814	0.68254	0.692308
grid, rbf kernel	0.704348	0.725806	0.714286	0.737705	0.714286	0.692308
grid, rbf kernel synthetic samples	0.704348	0.725806	0.714286	0.737705	0.714286	0.692308
grid, rbf kernel upsampled	0.643478	0.655462	0.619048	0.696429	0.619048	0.673077
grid, sigmoid kernel	0.643478	0.682171	0.698413	0.666667	0.698413	0.576923
grid, sigmoid kernel synthetic samples	0.66087	0.711111	0.761905	0.666667	0.761905	0.538462
grid, sigmoid kernel upsampled	0.573913	0.601626	0.587302	0.616667	0.587302	0.557692
random forest estimator	0.686957	0.672727	0.587302	0.787234	0.587302	0.807692
random forest estimator synthetic samples	0.678261	0.654206	0.555556	0.795455	0.555556	0.826923
random forest estimator, upsampled	0.66087	0.672269	0.634921	0.714286	0.634921	0.692308
knn 10	0.686957	0.714286	0.714286	0.714286	0.714286	0.653846
knn 10 synthetic samples	0.66087	0.682927	0.666667	0.7	0.666667	0.653846
knn 10 upsampled	0.617391	0.639344	0.619048	0.661017	0.619048	0.615385

TABLE CCI: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.765217	0.228571	0.137931	0.666667	0.137931	0.976744
Logistic regression synthetic samples	0.6	0.361111	0.448276	0.302326	0.448276	0.651163
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.747826	0.0645161	0.0344828	0.5	0.0344828	0.988372
svm, linear kernel, synthetic samples	0.626087	0.426667	0.551724	0.347826	0.551724	0.651163
svm, linear kernel upsampled samples	0.53913	0.361446	0.517241	0.277778	0.517241	0.546512
svm, poly	0.73913	0	0	0	0	0.988372
svm, poly synthetic samples	0.591304	0.405063	0.551724	0.32	0.551724	0.604651
svm, poly upsampled	0.513043	0.333333	0.482759	0.254545	0.482759	0.523256
grid, rbf kernel	0.747826	0	0	0	0	1
grid, rbf kernel synthetic samples	0.591304	0.373333	0.482759	0.304348	0.482759	0.627907
grid, rbf kernel upsampled	0.556522	0.37037	0.517241	0.288462	0.517241	0.569767
grid, sigmoid kernel	0.747826	0	0	0	0	1
grid, sigmoid kernel synthetic samples	0.530435	0.4	0.62069	0.295082	0.62069	0.5
grid, sigmoid kernel upsampled	0.513043	0.333333	0.482759	0.254545	0.482759	0.523256
random forest estimator	0.765217	0.129032	0.0689655	1	0.0689655	1
random forest estimator synthetic samples	0.721739	0.36	0.310345	0.428571	0.310345	0.860465
random forest estimator, upsampled	0.582609	0.4	0.551724	0.313725	0.551724	0.593023
knn 10	0.791304	0.294118	0.172414	1	0.172414	1
knn 10 synthetic samples	0.617391	0.405405	0.517241	0.333333	0.517241	0.651163
knn 10 upsampled	0.573913	0.328767	0.413793	0.272727	0.413793	0.627907

TABLE CCII: Numerical results of ML methods, using data between time of birth - time of birth + 1 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.935484	0.966667	0.990244	0.944186	0.990244	0
Logistic regression synthetic samples	0.695853	0.818681	0.726829	0.937107	0.726829	0.166667
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.935484	0.966667	0.990244	0.944186	0.990244	0
svm, linear kernel, synthetic samples	0.705069	0.824176	0.731707	0.943396	0.731707	0.25
svm, linear kernel upsampled samples	0.75576	0.857143	0.77561	0.957831	0.77561	0.416667
svm, poly	0.935484	0.966667	0.990244	0.944186	0.990244	0
svm, poly synthetic samples	0.732719	0.843243	0.760976	0.945455	0.760976	0.25
svm, poly upsampled	0.718894	0.831025	0.731707	0.961538	0.731707	0.5
grid, rbf kernel	0.9447	0.971564	1	0.9447	1	0
grid, rbf kernel synthetic samples	0.834101	0.909091	0.878049	0.942408	0.878049	0.0833333
grid, rbf kernel upsampled	0.875576	0.933333	0.921951	0.945	0.921951	0.0833333
grid, sigmoid kernel	0.9447	0.971564	1	0.9447	1	0
grid, sigmoid kernel synthetic samples	0.562212	0.705882	0.556098	0.966102	0.556098	0.666667
grid, sigmoid kernel upsampled	0.493088	0.647436	0.492683	0.943925	0.492683	0.5
random forest estimator	0.9447	0.971564	1	0.9447	1	0
random forest estimator synthetic samples	0.912442	0.953995	0.960976	0.947115	0.960976	0.0833333
random forest estimator, upsampled	0.9447	0.971429	0.995122	0.948837	0.995122	0.0833333
knn 10	0.949309	0.973872	1	0.949074	1	0.0833333
knn 10 synthetic samples	0.78341	0.877285	0.819512	0.94382	0.819512	0.166667
knn 10 upsampled	0.875576	0.933002	0.917073	0.949495	0.917073	0.166667

TABLE CCIII: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.870968	0.930693	0.984293	0.882629	0.984293	0.0384615
Logistic regression synthetic samples	0.705069	0.815029	0.73822	0.909677	0.73822	0.461538
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.880184	0.935961	0.994764	0.883721	0.994764	0.0384615
svm, linear kernel, synthetic samples	0.700461	0.811594	0.732984	0.909091	0.732984	0.461538
svm, linear kernel upsampled samples	0.741935	0.843575	0.790576	0.904192	0.790576	0.384615
svm, poly	0.875576	0.933333	0.989529	0.883178	0.989529	0.0384615
svm, poly synthetic samples	0.732719	0.834286	0.764398	0.918239	0.764398	0.5
svm, poly upsampled	0.732719	0.837989	0.78534	0.898204	0.78534	0.346154
grid, rbf kernel	0.880184	0.936275	1	0.880184	1	0
grid, rbf kernel synthetic samples	0.728111	0.832861	0.769634	0.907407	0.769634	0.423077
grid, rbf kernel upsampled	0.774194	0.865753	0.827225	0.908046	0.827225	0.384615
grid, sigmoid kernel	0.880184	0.936275	1	0.880184	1	0
grid, sigmoid kernel synthetic samples	0.589862	0.713826	0.581152	0.925	0.581152	0.653846
grid, sigmoid kernel upsampled	0.599078	0.716612	0.575916	0.948276	0.575916	0.769231
random forest estimator	0.880184	0.936275	1	0.880184	1	0
random forest estimator synthetic samples	0.81106	0.894057	0.905759	0.882653	0.905759	0.115385
random forest estimator, upsampled	0.866359	0.92804	0.979058	0.882075	0.979058	0.0384615
knn 10	0.884793	0.938575	1	0.884259	1	0.0384615
knn 10 synthetic samples	0.64977	0.775148	0.685864	0.891156	0.685864	0.384615
knn 10 upsampled	0.658986	0.783626	0.701571	0.887417	0.701571	0.346154

TABLE CCIV: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.723502	0.834254	0.961783	0.736585	0.961783	0.1
Logistic regression synthetic samples	0.62212	0.715278	0.656051	0.78626	0.656051	0.533333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.723502	0.837838	0.987261	0.7277	0.987261	0.0333333
svm, linear kernel, synthetic samples	0.64977	0.741497	0.694268	0.79562	0.694268	0.533333
svm, linear kernel upsampled samples	0.635945	0.734007	0.694268	0.778571	0.694268	0.483333
svm, poly	0.728111	0.84097	0.993631	0.728972	0.993631	0.0333333
svm, poly synthetic samples	0.658986	0.751678	0.713376	0.794326	0.713376	0.516667
svm, poly upsampled	0.677419	0.771242	0.751592	0.791946	0.751592	0.483333
grid, rbf kernel	0.705069	0.827027	0.974522	0.71831	0.974522	0
grid, rbf kernel synthetic samples	0.668203	0.76	0.726115	0.797203	0.726115	0.516667
grid, rbf kernel upsampled	0.631336	0.738562	0.719745	0.758389	0.719745	0.4
grid, sigmoid kernel	0.723502	0.839572	1	0.723502	1	0
grid, sigmoid kernel synthetic samples	0.62212	0.719178	0.66879	0.777778	0.66879	0.5
grid, sigmoid kernel upsampled	0.56682	0.671329	0.611465	0.744186	0.611465	0.45
random forest estimator	0.714286	0.826816	0.942675	0.736318	0.942675	0.116667
random forest estimator synthetic samples	0.700461	0.789644	0.77707	0.802632	0.77707	0.5
random forest estimator, upsampled	0.691244	0.795107	0.828025	0.764706	0.828025	0.333333
knn 10	0.75576	0.848138	0.942675	0.770833	0.942675	0.266667
knn 10 synthetic samples	0.62212	0.696296	0.598726	0.831858	0.598726	0.683333
knn 10 upsampled	0.576037	0.661765	0.573248	0.782609	0.573248	0.583333

TABLE CCV: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.603687	0.601852	0.637255	0.570175	0.637255	0.573913
Logistic regression synthetic samples	0.589862	0.600897	0.656863	0.553719	0.656863	0.530435
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.635945	0.635945	0.676471	0.6	0.676471	0.6
svm, linear kernel, synthetic samples	0.608295	0.64135	0.745098	0.562963	0.745098	0.486957
svm, linear kernel upsampled samples	0.576037	0.603448	0.686275	0.538462	0.686275	0.478261
svm, poly	0.631336	0.62963	0.666667	0.596491	0.666667	0.6
svm, poly synthetic samples	0.59447	0.627119	0.72549	0.552239	0.72549	0.478261
svm, poly upsampled	0.599078	0.620087	0.696078	0.559055	0.696078	0.513043
grid, rbf kernel	0.617512	0.613953	0.647059	0.584071	0.647059	0.591304
grid, rbf kernel synthetic samples	0.62212	0.646552	0.735294	0.576923	0.735294	0.521739
grid, rbf kernel upsampled	0.599078	0.623377	0.705882	0.55814	0.705882	0.504348
grid, sigmoid kernel	0.603687	0.561224	0.539216	0.585106	0.539216	0.66087
grid, sigmoid kernel synthetic samples	0.612903	0.588235	0.588235	0.588235	0.588235	0.634783
grid, sigmoid kernel upsampled	0.603687	0.582524	0.588235	0.576923	0.588235	0.617391
random forest estimator	0.603687	0.57	0.558824	0.581633	0.558824	0.643478
random forest estimator synthetic samples	0.59447	0.584906	0.607843	0.563636	0.607843	0.582609
random forest estimator, upsampled	0.599078	0.620087	0.696078	0.559055	0.696078	0.513043
knn 10	0.589862	0.597285	0.647059	0.554622	0.647059	0.53913
knn 10 synthetic samples	0.557604	0.578947	0.647059	0.52381	0.647059	0.478261
knn 10 upsampled	0.548387	0.581197	0.666667	0.515152	0.666667	0.443478

TABLE CCVI: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.709677	0.0597015	0.0322581	0.4	0.0322581	0.980645
Logistic regression synthetic samples	0.603687	0.448718	0.564516	0.37234	0.564516	0.619355
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.714286	0	0	0	0	1
svm, linear kernel, synthetic samples	0.511521	0.423913	0.629032	0.319672	0.629032	0.464516
svm, linear kernel upsampled samples	0.516129	0.41989	0.612903	0.319328	0.612903	0.477419
svm, poly	0.709677	0	0	0	0	0.993548
svm, poly synthetic samples	0.502304	0.413043	0.612903	0.311475	0.612903	0.458065
svm, poly upsampled	0.529954	0.43956	0.645161	0.333333	0.645161	0.483871
grid, rbf kernel	0.714286	0	0	0	0	1
grid, rbf kernel synthetic samples	0.585253	0.457831	0.612903	0.365385	0.612903	0.574194
grid, rbf kernel upsampled	0.557604	0.460674	0.66129	0.353448	0.66129	0.516129
grid, sigmoid kernel	0.705069	0	0	0	0	0.987097
grid, sigmoid kernel synthetic samples	0.617512	0.477987	0.612903	0.391753	0.612903	0.619355
grid, sigmoid kernel upsampled	0.548387	0.449438	0.645161	0.344828	0.645161	0.509677
random forest estimator	0.718894	0.031746	0.016129	1	0.016129	1
random forest estimator synthetic samples	0.640553	0.277778	0.241935	0.326087	0.241935	0.8
random forest estimator, upsampled	0.576037	0.402597	0.5	0.336957	0.5	0.606452
knn 10	0.728111	0.169014	0.0967742	0.666667	0.0967742	0.980645
knn 10 synthetic samples	0.589862	0.491429	0.693548	0.380531	0.693548	0.548387
knn 10 upsampled	0.552995	0.412121	0.548387	0.330097	0.548387	0.554839

TABLE CCVII: Numerical results of ML methods, using data between time of birth - time of birth + 2 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.949275	0.973978	0.992424	0.956204	0.992424	0
Logistic regression synthetic samples	0.771739	0.869023	0.791667	0.963134	0.791667	0.333333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.952899	0.975881	0.996212	0.956364	0.996212	0
svm, linear kernel, synthetic samples	0.76087	0.861345	0.776515	0.966981	0.776515	0.416667
svm, linear kernel upsampled samples	0.793478	0.882474	0.810606	0.968326	0.810606	0.416667
svm, poly	0.949275	0.973978	0.992424	0.956204	0.992424	0
svm, poly synthetic samples	0.76087	0.860759	0.772727	0.971429	0.772727	0.5
svm, poly upsampled	0.811594	0.893878	0.829545	0.969027	0.829545	0.416667
grid, rbf kernel	0.956522	0.977778	1	0.956522	1	0
grid, rbf kernel synthetic samples	0.826087	0.903614	0.852273	0.961538	0.852273	0.25
grid, rbf kernel upsampled	0.865942	0.927022	0.890152	0.967078	0.890152	0.333333
grid, sigmoid kernel	0.956522	0.977778	1	0.956522	1	0
grid, sigmoid kernel synthetic samples	0.688406	0.811404	0.700758	0.963542	0.700758	0.416667
grid, sigmoid kernel upsampled	0.561594	0.708434	0.556818	0.97351	0.556818	0.666667
random forest estimator	0.956522	0.977778	1	0.956522	1	0
random forest estimator synthetic samples	0.887681	0.94027	0.924242	0.956863	0.924242	0.0833333
random forest estimator, upsampled	0.942029	0.970037	0.981061	0.959259	0.981061	0.0833333
knn 10	0.960145	0.979592	1	0.96	1	0.0833333
knn 10 synthetic samples	0.789855	0.879668	0.80303	0.972477	0.80303	0.5
knn 10 upsampled	0.884058	0.937255	0.905303	0.971545	0.905303	0.416667

TABLE CCVIII: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.90942	0.952381	0.988142	0.919118	0.988142	0.0434783
Logistic regression synthetic samples	0.608696	0.745283	0.624506	0.923977	0.624506	0.434783
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.90942	0.952562	0.992095	0.916058	0.992095	0
svm, linear kernel, synthetic samples	0.605072	0.745921	0.632411	0.909091	0.632411	0.304348
svm, linear kernel upsampled samples	0.710145	0.82684	0.754941	0.913876	0.754941	0.217391
svm, poly	0.90942	0.952562	0.992095	0.916058	0.992095	0
svm, poly synthetic samples	0.619565	0.757506	0.648221	0.911111	0.648221	0.304348
svm, poly upsampled	0.753623	0.85654	0.802372	0.918552	0.802372	0.217391
grid, rbf kernel	0.916667	0.956522	1	0.916667	1	0
grid, rbf kernel synthetic samples	0.677536	0.802661	0.715415	0.914141	0.715415	0.26087
grid, rbf kernel upsampled	0.778986	0.872651	0.826087	0.924779	0.826087	0.26087
grid, sigmoid kernel	0.90942	0.952562	0.992095	0.916058	0.992095	0
grid, sigmoid kernel synthetic samples	0.554348	0.70073	0.56917	0.911392	0.56917	0.391304
grid, sigmoid kernel upsampled	0.543478	0.691176	0.557312	0.909677	0.557312	0.391304
random forest estimator	0.916667	0.956522	1	0.916667	1	0
random forest estimator synthetic samples	0.800725	0.887526	0.857708	0.919492	0.857708	0.173913
random forest estimator, upsampled	0.869565	0.929412	0.936759	0.922179	0.936759	0.130435
knn 10	0.927536	0.961977	1	0.92674	1	0.130435
knn 10 synthetic samples	0.641304	0.773455	0.667984	0.918478	0.667984	0.347826
knn 10 upsampled	0.673913	0.800885	0.715415	0.909548	0.715415	0.217391

TABLE CCIX: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.731884	0.838428	0.932039	0.761905	0.932039	0.142857
Logistic regression synthetic samples	0.615942	0.710383	0.631068	0.8125	0.631068	0.571429
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.731884	0.845188	0.980583	0.742647	0.980583	0
svm, linear kernel, synthetic samples	0.630435	0.724324	0.650485	0.817073	0.650485	0.571429
svm, linear kernel upsampled samples	0.630435	0.727273	0.660194	0.809524	0.660194	0.542857
svm, poly	0.73913	0.85	0.990291	0.744526	0.990291	0
svm, poly synthetic samples	0.619565	0.716981	0.645631	0.806061	0.645631	0.542857
svm, poly upsampled	0.615942	0.721053	0.665049	0.787356	0.665049	0.471429
grid, rbf kernel	0.746377	0.854167	0.995146	0.748175	0.995146	0.0142857
grid, rbf kernel synthetic samples	0.57971	0.68306	0.606796	0.78125	0.606796	0.5
grid, rbf kernel upsampled	0.637681	0.742268	0.699029	0.791209	0.699029	0.457143
grid, sigmoid kernel	0.73913	0.849372	0.985437	0.746324	0.985437	0.0142857
grid, sigmoid kernel synthetic samples	0.57971	0.672316	0.57767	0.804054	0.57767	0.585714
grid, sigmoid kernel upsampled	0.583333	0.672365	0.572816	0.813793	0.572816	0.614286
random forest estimator	0.753623	0.85654	0.985437	0.757463	0.985437	0.0714286
random forest estimator synthetic samples	0.695652	0.791045	0.771845	0.811224	0.771845	0.471429
random forest estimator, upsampled	0.724638	0.821596	0.849515	0.795455	0.849515	0.357143
knn 10	0.75	0.847682	0.932039	0.777328	0.932039	0.214286
knn 10 synthetic samples	0.572464	0.664773	0.567961	0.80137	0.567961	0.585714
knn 10 upsampled	0.601449	0.699454	0.621359	0.8	0.621359	0.542857

TABLE CCX: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.586957	0.598592	0.594406	0.602837	0.594406	0.578947
Logistic regression synthetic samples	0.605072	0.62543	0.636364	0.614865	0.636364	0.571429
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.601449	0.62069	0.629371	0.612245	0.629371	0.571429
svm, linear kernel, synthetic samples	0.626812	0.657807	0.692308	0.626582	0.692308	0.556391
svm, linear kernel upsampled samples	0.623188	0.657895	0.699301	0.621118	0.699301	0.541353
svm, poly	0.59058	0.592058	0.573427	0.61194	0.573427	0.609023
svm, poly synthetic samples	0.597826	0.626263	0.65035	0.603896	0.65035	0.541353
svm, poly upsampled	0.615942	0.660256	0.72028	0.609467	0.72028	0.503759
grid, rbf kernel	0.586957	0.577778	0.545455	0.614173	0.545455	0.631579
grid, rbf kernel synthetic samples	0.586957	0.61745	0.643357	0.593548	0.643357	0.526316
grid, rbf kernel upsampled	0.594203	0.621622	0.643357	0.601307	0.643357	0.541353
grid, sigmoid kernel	0.59058	0.608997	0.615385	0.60274	0.615385	0.56391
grid, sigmoid kernel synthetic samples	0.597826	0.626263	0.65035	0.603896	0.65035	0.541353
grid, sigmoid kernel upsampled	0.623188	0.657895	0.699301	0.621118	0.699301	0.541353
random forest estimator	0.57971	0.553846	0.503497	0.615385	0.503497	0.661654
random forest estimator synthetic samples	0.57971	0.56391	0.524476	0.609756	0.524476	0.639098
random forest estimator, upsampled	0.565217	0.589041	0.601399	0.577181	0.601399	0.526316
knn 10	0.57971	0.57037	0.538462	0.606299	0.538462	0.62406
knn 10 synthetic samples	0.576087	0.58363	0.573427	0.594203	0.573427	0.578947
knn 10 upsampled	0.572464	0.601351	0.622378	0.581699	0.622378	0.518797

TABLE CCXI: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.75	0.0547945	0.0285714	0.666667	0.0285714	0.995146
Logistic regression synthetic samples	0.514493	0.316327	0.442857	0.246032	0.442857	0.538835
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.746377	0	0	0	0	1
svm, linear kernel, synthetic samples	0.48913	0.367713	0.585714	0.267974	0.585714	0.456311
svm, linear kernel upsampled samples	0.518116	0.357488	0.528571	0.270073	0.528571	0.514563
svm, poly	0.746377	0	0	0	0	1
svm, poly synthetic samples	0.492754	0.363636	0.571429	0.266667	0.571429	0.466019
svm, poly upsampled	0.51087	0.341463	0.5	0.259259	0.5	0.514563
grid, rbf kernel	0.746377	0	0	0	0	1
grid, rbf kernel synthetic samples	0.514493	0.343137	0.5	0.261194	0.5	0.519417
grid, rbf kernel upsampled	0.514493	0.343137	0.5	0.261194	0.5	0.519417
grid, sigmoid kernel	0.731884	0	0	0	0	0.980583
grid, sigmoid kernel synthetic samples	0.532609	0.364532	0.528571	0.278195	0.528571	0.533981
grid, sigmoid kernel upsampled	0.48913	0.361991	0.571429	0.264901	0.571429	0.461165
random forest estimator	0.757246	0.0821918	0.0428571	1	0.0428571	1
random forest estimator synthetic samples	0.634058	0.331126	0.357143	0.308642	0.357143	0.728155
random forest estimator, upsampled	0.565217	0.368421	0.5	0.291667	0.5	0.587379
knn 10	0.724638	0.208333	0.142857	0.384615	0.142857	0.92233
knn 10 synthetic samples	0.550725	0.360825	0.5	0.282258	0.5	0.567961
knn 10 upsampled	0.547101	0.384236	0.557143	0.293233	0.557143	0.543689

TABLE CCXII: Numerical results of ML methods, using data between time of birth - time of birth + 3 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.950658	0.974705	0.993127	0.956954	0.993127	0
Logistic regression synthetic samples	0.75	0.854406	0.766323	0.965368	0.766323	0.384615
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.957237	0.978151	1	0.957237	1	0
svm, linear kernel, synthetic samples	0.703947	0.822835	0.718213	0.963134	0.718213	0.384615
svm, linear kernel upsampled samples	0.753289	0.856597	0.769759	0.965517	0.769759	0.384615
svm, poly	0.957237	0.978151	1	0.957237	1	0
svm, poly synthetic samples	0.713816	0.829746	0.728522	0.963636	0.728522	0.384615
svm, poly upsampled	0.865132	0.926916	0.893471	0.962963	0.893471	0.230769
grid, rbf kernel	0.957237	0.978151	1	0.957237	1	0
grid, rbf kernel synthetic samples	0.832237	0.907104	0.85567	0.965116	0.85567	0.307692
grid, rbf kernel upsampled	0.871711	0.930973	0.90378	0.959854	0.90378	0.153846
grid, sigmoid kernel	0.957237	0.978151	1	0.957237	1	0
grid, sigmoid kernel synthetic samples	0.644737	0.777778	0.649485	0.969231	0.649485	0.538462
grid, sigmoid kernel upsampled	0.496711	0.653061	0.494845	0.96	0.494845	0.538462
random forest estimator	0.957237	0.978151	1	0.957237	1	0
random forest estimator synthetic samples	0.901316	0.947735	0.934708	0.961131	0.934708	0.153846
random forest estimator, upsampled	0.9375	0.967632	0.975945	0.959459	0.975945	0.0769231
knn 10	0.960526	0.979798	1	0.960396	1	0.0769231
knn 10 synthetic samples	0.763158	0.863118	0.780069	0.965957	0.780069	0.384615
knn 10 upsampled	0.861842	0.925	0.890034	0.962825	0.890034	0.230769

TABLE CCXIII: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.845395	0.915619	0.980769	0.858586	0.980769	0.0454545
Logistic regression synthetic samples	0.674342	0.792453	0.726923	0.870968	0.726923	0.363636
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.845395	0.915921	0.984615	0.856187	0.984615	0.0227273
svm, linear kernel, synthetic samples	0.671053	0.789916	0.723077	0.87037	0.723077	0.363636
svm, linear kernel upsampled samples	0.6875	0.807302	0.765385	0.854077	0.765385	0.227273
svm, poly	0.851974	0.91921	0.984615	0.861953	0.984615	0.0681818
svm, poly synthetic samples	0.713816	0.822086	0.773077	0.877729	0.773077	0.363636
svm, poly upsampled	0.746711	0.849315	0.834615	0.864542	0.834615	0.227273
grid, rbf kernel	0.858553	0.923623	1	0.858086	1	0.0227273
grid, rbf kernel synthetic samples	0.707237	0.817248	0.765385	0.876652	0.765385	0.363636
grid, rbf kernel upsampled	0.763158	0.862595	0.869231	0.856061	0.869231	0.136364
grid, sigmoid kernel	0.845395	0.916221	0.988462	0.853821	0.988462	0
grid, sigmoid kernel synthetic samples	0.575658	0.707483	0.6	0.861878	0.6	0.431818
grid, sigmoid kernel upsampled	0.569079	0.702948	0.596154	0.856354	0.596154	0.409091
random forest estimator	0.855263	0.921986	1	0.855263	1	0
random forest estimator synthetic samples	0.822368	0.898876	0.923077	0.875912	0.923077	0.227273
random forest estimator, upsampled	0.842105	0.912727	0.965385	0.865517	0.965385	0.113636
knn 10	0.868421	0.928571	1	0.866667	1	0.0909091
knn 10 synthetic samples	0.667763	0.784648	0.707692	0.880383	0.707692	0.431818
knn 10 upsampled	0.6875	0.800839	0.734615	0.880184	0.734615	0.409091

TABLE CCXIV: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.710526	0.824701	0.971831	0.716263	0.971831	0.0989011
Logistic regression synthetic samples	0.546053	0.638743	0.57277	0.721893	0.57277	0.483516
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.700658	0.822612	0.99061	0.703333	0.99061	0.021978
svm, linear kernel, synthetic samples	0.555921	0.645669	0.577465	0.732143	0.577465	0.505495
svm, linear kernel upsampled samples	0.621711	0.718826	0.690141	0.75	0.690141	0.461538
svm, poly	0.710526	0.827451	0.99061	0.710438	0.99061	0.0549451
svm, poly synthetic samples	0.585526	0.678571	0.624413	0.743017	0.624413	0.494505
svm, poly upsampled	0.641447	0.736077	0.713615	0.76	0.713615	0.472527
grid, rbf kernel	0.703947	0.825581	1	0.70297	1	0.010989
grid, rbf kernel synthetic samples	0.605263	0.698492	0.652582	0.751351	0.652582	0.494505
grid, rbf kernel upsampled	0.644737	0.73913	0.71831	0.761194	0.71831	0.472527
grid, sigmoid kernel	0.690789	0.816406	0.981221	0.698997	0.981221	0.010989
grid, sigmoid kernel synthetic samples	0.552632	0.617978	0.516432	0.769231	0.516432	0.637363
grid, sigmoid kernel upsampled	0.565789	0.673267	0.638498	0.712042	0.638498	0.395604
random forest estimator	0.700658	0.822612	0.99061	0.703333	0.99061	0.021978
random forest estimator synthetic samples	0.684211	0.777778	0.788732	0.767123	0.788732	0.43956
random forest estimator, upsampled	0.680921	0.784922	0.830986	0.743697	0.830986	0.32967
knn 10	0.717105	0.827309	0.967136	0.722807	0.967136	0.131868
knn 10 synthetic samples	0.578947	0.652174	0.56338	0.774194	0.56338	0.615385
knn 10 upsampled	0.621711	0.707379	0.652582	0.772222	0.652582	0.549451

TABLE CCXV: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.536184	0.505263	0.521739	0.489796	0.521739	0.548193
Logistic regression synthetic samples	0.526316	0.492958	0.507246	0.479452	0.507246	0.542169
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.526316	0.510204	0.543478	0.480769	0.543478	0.512048
svm, linear kernel, synthetic samples	0.526316	0.496503	0.514493	0.47973	0.514493	0.536145
svm, linear kernel upsampled samples	0.523026	0.476534	0.478261	0.47482	0.478261	0.560241
svm, poly	0.5625	0.536585	0.557971	0.516779	0.557971	0.566265
svm, poly synthetic samples	0.549342	0.501818	0.5	0.50365	0.5	0.590361
svm, poly upsampled	0.5625	0.501873	0.485507	0.51938	0.485507	0.626506
grid, rbf kernel	0.555921	0.532872	0.557971	0.509934	0.557971	0.554217
grid, rbf kernel synthetic samples	0.536184	0.487273	0.485507	0.489051	0.485507	0.578313
grid, rbf kernel upsampled	0.555921	0.494382	0.478261	0.511628	0.478261	0.620482
grid, sigmoid kernel	0.555921	0.557377	0.615942	0.508982	0.615942	0.506024
grid, sigmoid kernel synthetic samples	0.588816	0.56446	0.586957	0.543624	0.586957	0.590361
grid, sigmoid kernel upsampled	0.569079	0.558923	0.601449	0.522013	0.601449	0.542169
random forest estimator	0.5625	0.530035	0.543478	0.517241	0.543478	0.578313
random forest estimator synthetic samples	0.575658	0.527473	0.521739	0.533333	0.521739	0.620482
random forest estimator, upsampled	0.536184	0.543689	0.608696	0.491228	0.608696	0.475904
knn 10	0.559211	0.541096	0.572464	0.512987	0.572464	0.548193
knn 10 synthetic samples	0.5625	0.52669	0.536232	0.517483	0.536232	0.584337
knn 10 upsampled	0.578947	0.555556	0.57971	0.533333	0.57971	0.578313

TABLE CCXVI: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.746711	0.0253165	0.0128205	1	0.0128205	1
Logistic regression synthetic samples	0.559211	0.40708	0.589744	0.310811	0.589744	0.548673
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.743421	0	0	0	0	1
svm, linear kernel, synthetic samples	0.523026	0.408163	0.641026	0.299401	0.641026	0.482301
svm, linear kernel upsampled samples	0.480263	0.435714	0.782051	0.30198	0.782051	0.376106
svm, poly	0.743421	0	0	0	0	1
svm, poly synthetic samples	0.523026	0.408163	0.641026	0.299401	0.641026	0.482301
svm, poly upsampled	0.453947	0.427586	0.794872	0.292453	0.794872	0.336283
grid, rbf kernel	0.743421	0	0	0	0	1
grid, rbf kernel synthetic samples	0.565789	0.388889	0.538462	0.304348	0.538462	0.575221
grid, rbf kernel upsampled	0.513158	0.426357	0.705128	0.305556	0.705128	0.446903
grid, sigmoid kernel	0.726974	0.0235294	0.0128205	0.142857	0.0128205	0.973451
grid, sigmoid kernel synthetic samples	0.539474	0.416667	0.641026	0.308642	0.641026	0.504425
grid, sigmoid kernel upsampled	0.470395	0.410256	0.717949	0.287179	0.717949	0.384956
random forest estimator	0.753289	0.0740741	0.0384615	1	0.0384615	1
random forest estimator synthetic samples	0.674342	0.33557	0.320513	0.352113	0.320513	0.79646
random forest estimator, upsampled	0.592105	0.431193	0.602564	0.335714	0.602564	0.588496
knn 10	0.730263	0.211538	0.141026	0.423077	0.141026	0.933628
knn 10 synthetic samples	0.585526	0.394231	0.525641	0.315385	0.525641	0.606195
knn 10 upsampled	0.555921	0.383562	0.538462	0.297872	0.538462	0.561947

TABLE CCXVII: Numerical results of ML methods, using data between time of birth - time of birth + 4 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.95107	0.974922	1	0.95107	1	0
Logistic regression synthetic samples	0.733945	0.84492	0.762058	0.948	0.762058	0.1875
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.944954	0.971698	0.993569	0.950769	0.993569	0
svm, linear kernel, synthetic samples	0.715596	0.830601	0.733119	0.957983	0.733119	0.375
svm, linear kernel upsampled samples	0.746177	0.85205	0.768489	0.956	0.768489	0.3125
svm, poly	0.948012	0.973312	0.996785	0.95092	0.996785	0
svm, poly synthetic samples	0.740061	0.846847	0.755627	0.963115	0.755627	0.4375
svm, poly upsampled	0.733945	0.844365	0.758842	0.951613	0.758842	0.25
grid, rbf kernel	0.95107	0.974922	1	0.95107	1	0
grid, rbf kernel synthetic samples	0.83792	0.909402	0.855305	0.970803	0.855305	0.5
grid, rbf kernel upsampled	0.859327	0.922559	0.881029	0.968198	0.881029	0.4375
grid, sigmoid kernel	0.95107	0.974922	1	0.95107	1	0
grid, sigmoid kernel synthetic samples	0.642202	0.777143	0.655949	0.953271	0.655949	0.375
grid, sigmoid kernel upsampled	0.544343	0.695297	0.546624	0.955056	0.546624	0.5
random forest estimator	0.95107	0.974922	1	0.95107	1	0
random forest estimator synthetic samples	0.920489	0.958199	0.958199	0.958199	0.958199	0.1875
random forest estimator, upsampled	0.948012	0.973144	0.990354	0.956522	0.990354	0.125
knn 10	0.957187	0.977987	1	0.956923	1	0.125
knn 10 synthetic samples	0.798165	0.885017	0.81672	0.965779	0.81672	0.4375
knn 10 upsampled	0.880734	0.935537	0.909968	0.962585	0.909968	0.3125

TABLE CCXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.853211	0.92053	0.978873	0.86875	0.978873	0.0232558
Logistic regression synthetic samples	0.59633	0.730612	0.630282	0.868932	0.630282	0.372093
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.856269	0.92257	0.985915	0.866873	0.985915	0
svm, linear kernel, synthetic samples	0.568807	0.703158	0.588028	0.874346	0.588028	0.44186
svm, linear kernel upsampled samples	0.614679	0.746988	0.65493	0.869159	0.65493	0.348837
svm, poly	0.862385	0.925865	0.989437	0.869969	0.989437	0.0232558
svm, poly synthetic samples	0.587156	0.718163	0.605634	0.882051	0.605634	0.465116
svm, poly upsampled	0.669725	0.792308	0.725352	0.872881	0.725352	0.302326
grid, rbf kernel	0.862385	0.926108	0.992958	0.867692	0.992958	0
grid, rbf kernel synthetic samples	0.590214	0.72541	0.623239	0.867647	0.623239	0.372093
grid, rbf kernel upsampled	0.703364	0.815238	0.753521	0.887967	0.753521	0.372093
grid, sigmoid kernel	0.865443	0.927869	0.996479	0.868098	0.996479	0
grid, sigmoid kernel synthetic samples	0.538226	0.668132	0.535211	0.888889	0.535211	0.55814
grid, sigmoid kernel upsampled	0.529052	0.666667	0.542254	0.865169	0.542254	0.44186
random forest estimator	0.868502	0.929624	1	0.868502	1	0
random forest estimator synthetic samples	0.819572	0.899145	0.926056	0.873754	0.926056	0.116279
random forest estimator, upsampled	0.874618	0.932455	0.996479	0.876161	0.996479	0.0697674
knn 10	0.87156	0.930693	0.992958	0.875776	0.992958	0.0697674
knn 10 synthetic samples	0.629969	0.750515	0.640845	0.905473	0.640845	0.55814
knn 10 upsampled	0.697248	0.80396	0.714789	0.918552	0.714789	0.581395

TABLE CCXIX: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.700306	0.819188	0.956897	0.716129	0.956897	0.0736842
Logistic regression synthetic samples	0.590214	0.676329	0.603448	0.769231	0.603448	0.557895
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.70948	0.829443	0.99569	0.710769	0.99569	0.0105263
svm, linear kernel, synthetic samples	0.584098	0.668293	0.590517	0.769663	0.590517	0.568421
svm, linear kernel upsampled samples	0.590214	0.692661	0.650862	0.740196	0.650862	0.442105
svm, poly	0.70948	0.827586	0.982759	0.714734	0.982759	0.0421053
svm, poly synthetic samples	0.58104	0.661728	0.577586	0.774566	0.577586	0.589474
svm, poly upsampled	0.614679	0.709677	0.663793	0.762376	0.663793	0.494737
grid, rbf kernel	0.70948	0.829443	0.99569	0.710769	0.99569	0.0105263
grid, rbf kernel synthetic samples	0.608563	0.696682	0.633621	0.773684	0.633621	0.547368
grid, rbf kernel upsampled	0.611621	0.706697	0.659483	0.761194	0.659483	0.494737
grid, sigmoid kernel	0.691131	0.813309	0.948276	0.711974	0.948276	0.0631579
grid, sigmoid kernel synthetic samples	0.59633	0.671642	0.581897	0.794118	0.581897	0.631579
grid, sigmoid kernel upsampled	0.519878	0.600509	0.508621	0.732919	0.508621	0.547368
random forest estimator	0.718654	0.833333	0.991379	0.71875	0.991379	0.0526316
random forest estimator synthetic samples	0.636086	0.733781	0.706897	0.762791	0.706897	0.463158
random forest estimator, upsampled	0.678899	0.780793	0.806034	0.757085	0.806034	0.368421
knn 10	0.70948	0.823091	0.952586	0.72459	0.952586	0.115789
knn 10 synthetic samples	0.529052	0.616915	0.534483	0.729412	0.534483	0.515789
knn 10 upsampled	0.58104	0.680653	0.62931	0.741117	0.62931	0.463158

TABLE CCXX: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.58104	0.575851	0.553571	0.6	0.553571	0.610063
Logistic regression synthetic samples	0.587156	0.592145	0.583333	0.601227	0.583333	0.591195
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.584098	0.587879	0.577381	0.598765	0.577381	0.591195
svm, linear kernel, synthetic samples	0.593272	0.612245	0.625	0.6	0.625	0.559748
svm, linear kernel upsampled samples	0.599388	0.618076	0.630952	0.605714	0.630952	0.566038
svm, poly	0.605505	0.614925	0.613095	0.616766	0.613095	0.597484
svm, poly synthetic samples	0.593272	0.612245	0.625	0.6	0.625	0.559748
svm, poly upsampled	0.605505	0.626087	0.642857	0.610169	0.642857	0.566038
grid, rbf kernel	0.599388	0.606607	0.60119	0.612121	0.60119	0.597484
grid, rbf kernel synthetic samples	0.59633	0.616279	0.630952	0.602273	0.630952	0.559748
grid, rbf kernel upsampled	0.574924	0.614958	0.660714	0.57513	0.660714	0.484277
grid, sigmoid kernel	0.59633	0.582278	0.547619	0.621622	0.547619	0.647799
grid, sigmoid kernel synthetic samples	0.584098	0.57764	0.553571	0.603896	0.553571	0.616352
grid, sigmoid kernel upsampled	0.568807	0.566154	0.547619	0.585987	0.547619	0.591195
random forest estimator	0.602446	0.580645	0.535714	0.633803	0.535714	0.672956
random forest estimator synthetic samples	0.605505	0.59306	0.559524	0.630872	0.559524	0.654088
random forest estimator, upsampled	0.571865	0.6	0.625	0.576923	0.625	0.515723
knn 10	0.608563	0.612121	0.60119	0.623457	0.60119	0.616352
knn 10 synthetic samples	0.614679	0.631579	0.642857	0.62069	0.642857	0.584906
knn 10 upsampled	0.590214	0.617143	0.642857	0.593407	0.642857	0.534591

TABLE CCXXI: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.743119	0.0232558	0.0119048	0.5	0.0119048	0.995885
Logistic regression synthetic samples	0.529052	0.368852	0.535714	0.28125	0.535714	0.526749
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.743119	0	0	0	0	1
svm, linear kernel, synthetic samples	0.504587	0.390977	0.619048	0.285714	0.619048	0.465021
svm, linear kernel upsampled samples	0.544343	0.396761	0.583333	0.300613	0.583333	0.530864
svm, poly	0.743119	0	0	0	0	1
svm, poly synthetic samples	0.507645	0.397004	0.630952	0.289617	0.630952	0.465021
svm, poly upsampled	0.538226	0.388664	0.571429	0.294479	0.571429	0.526749
grid, rbf kernel	0.743119	0	0	0	0	1
grid, rbf kernel synthetic samples	0.541284	0.380165	0.547619	0.291139	0.547619	0.539095
grid, rbf kernel upsampled	0.535168	0.424242	0.666667	0.311111	0.666667	0.489712
grid, sigmoid kernel	0.721713	0.0421053	0.0238095	0.181818	0.0238095	0.962963
grid, sigmoid kernel synthetic samples	0.541284	0.404762	0.607143	0.303571	0.607143	0.518519
grid, sigmoid kernel upsampled	0.574924	0.387665	0.52381	0.307692	0.52381	0.592593
random forest estimator	0.743119	0	0	0	0	1
random forest estimator synthetic samples	0.675841	0.397727	0.416667	0.380435	0.416667	0.765432
random forest estimator, upsampled	0.568807	0.433735	0.642857	0.327273	0.642857	0.54321
knn 10	0.755352	0.2	0.119048	0.625	0.119048	0.975309
knn 10 synthetic samples	0.556575	0.382979	0.535714	0.298013	0.535714	0.563786
knn 10 upsampled	0.529052	0.347458	0.488095	0.269737	0.488095	0.54321

TABLE CCXXII: Numerical results of ML methods, using data between time of birth - time of birth + 5 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.958944	0.979042	1	0.958944	1	0
Logistic regression synthetic samples	0.709677	0.824779	0.712538	0.978992	0.712538	0.642857
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.958944	0.979042	1	0.958944	1	0
svm, linear kernel, synthetic samples	0.662757	0.789762	0.66055	0.981818	0.66055	0.714286
svm, linear kernel upsampled samples	0.662757	0.789762	0.66055	0.981818	0.66055	0.714286
svm, poly	0.958944	0.979042	1	0.958944	1	0
svm, poly synthetic samples	0.68915	0.810714	0.69419	0.974249	0.69419	0.571429
svm, poly upsampled	0.662757	0.790528	0.663609	0.977477	0.663609	0.642857
grid, rbf kernel	0.958944	0.979042	1	0.958944	1	0
grid, rbf kernel synthetic samples	0.856305	0.9216	0.880734	0.966443	0.880734	0.285714
grid, rbf kernel upsampled	0.865103	0.926984	0.892966	0.963696	0.892966	0.214286
grid, sigmoid kernel	0.964809	0.981982	1	0.964602	1	0.142857
grid, sigmoid kernel synthetic samples	0.55132	0.701754	0.550459	0.967742	0.550459	0.571429
grid, sigmoid kernel upsampled	0.580645	0.727619	0.584098	0.964646	0.584098	0.5
random forest estimator	0.958944	0.979042	1	0.958944	1	0
random forest estimator synthetic samples	0.917889	0.95679	0.948012	0.965732	0.948012	0.214286
random forest estimator, upsampled	0.961877	0.980451	0.996942	0.964497	0.996942	0.142857
knn 10	0.964809	0.981982	1	0.964602	1	0.142857
knn 10 synthetic samples	0.777126	0.872483	0.795107	0.966543	0.795107	0.357143
knn 10 upsampled	0.832845	0.907916	0.859327	0.962329	0.859327	0.214286

TABLE CCXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.903226	0.949153	1	0.903226	1	0
Logistic regression synthetic samples	0.58651	0.726214	0.607143	0.903382	0.607143	0.393939
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.903226	0.949153	1	0.903226	1	0
svm, linear kernel, synthetic samples	0.565982	0.70751	0.581169	0.90404	0.581169	0.424242
svm, linear kernel upsampled samples	0.627566	0.759924	0.652597	0.909502	0.652597	0.393939
svm, poly	0.903226	0.949153	1	0.903226	1	0
svm, poly synthetic samples	0.542522	0.686747	0.555195	0.9	0.555195	0.424242
svm, poly upsampled	0.680352	0.798521	0.701299	0.927039	0.701299	0.484848
grid, rbf kernel	0.903226	0.949153	1	0.903226	1	0
grid, rbf kernel synthetic samples	0.601173	0.743396	0.63961	0.887387	0.63961	0.242424
grid, rbf kernel upsampled	0.671554	0.797101	0.714286	0.901639	0.714286	0.272727
grid, sigmoid kernel	0.906158	0.95	0.987013	0.915663	0.987013	0.151515
grid, sigmoid kernel synthetic samples	0.539589	0.677618	0.535714	0.921788	0.535714	0.575758
grid, sigmoid kernel upsampled	0.542522	0.680328	0.538961	0.922222	0.538961	0.575758
random forest estimator	0.903226	0.949153	1	0.903226	1	0
random forest estimator synthetic samples	0.803519	0.889621	0.876623	0.90301	0.876623	0.121212
random forest estimator, upsampled	0.897361	0.945568	0.987013	0.907463	0.987013	0.0606061
knn 10	0.909091	0.952087	1	0.908555	1	0.0606061
knn 10 synthetic samples	0.624633	0.758491	0.652597	0.905405	0.652597	0.363636
knn 10 upsampled	0.677419	0.796296	0.698052	0.926724	0.698052	0.484848

TABLE CCXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.730205	0.84083	0.983806	0.734139	0.983806	0.0638298
Logistic regression synthetic samples	0.548387	0.643519	0.562753	0.751351	0.562753	0.510638
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.730205	0.842466	0.995951	0.72997	0.995951	0.0319149
svm, linear kernel, synthetic samples	0.536657	0.630841	0.546559	0.745856	0.546559	0.510638
svm, linear kernel upsampled samples	0.554252	0.636364	0.538462	0.777778	0.538462	0.595745
svm, poly	0.730205	0.841924	0.991903	0.731343	0.991903	0.0425532
svm, poly synthetic samples	0.548387	0.635071	0.54251	0.765714	0.54251	0.56383
svm, poly upsampled	0.577713	0.672727	0.59919	0.766839	0.59919	0.521277
grid, rbf kernel	0.72434	0.840136	1	0.72434	1	0
grid, rbf kernel synthetic samples	0.545455	0.643678	0.566802	0.744681	0.566802	0.489362
grid, rbf kernel upsampled	0.618768	0.72103	0.680162	0.767123	0.680162	0.457447
grid, sigmoid kernel	0.72434	0.840136	1	0.72434	1	0
grid, sigmoid kernel synthetic samples	0.539589	0.623501	0.526316	0.764706	0.526316	0.574468
grid, sigmoid kernel upsampled	0.507331	0.588235	0.48583	0.745342	0.48583	0.56383
random forest estimator	0.718475	0.836177	0.991903	0.722714	0.991903	0
random forest estimator synthetic samples	0.612903	0.725	0.704453	0.746781	0.704453	0.37234
random forest estimator, upsampled	0.665689	0.777344	0.805668	0.750943	0.805668	0.297872
knn 10	0.71261	0.827465	0.951417	0.732087	0.951417	0.0851064
knn 10 synthetic samples	0.510264	0.617849	0.546559	0.710526	0.546559	0.414894
knn 10 upsampled	0.565982	0.679654	0.635628	0.730233	0.635628	0.382979

TABLE CCXXV: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.565982	0.567251	0.587879	0.548023	0.587879	0.545455
Logistic regression synthetic samples	0.557185	0.546547	0.551515	0.541667	0.551515	0.5625
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.56305	0.557864	0.569697	0.546512	0.569697	0.556818
svm, linear kernel, synthetic samples	0.557185	0.543807	0.545455	0.542169	0.545455	0.568182
svm, linear kernel upsampled samples	0.565982	0.579545	0.618182	0.545455	0.618182	0.517045
svm, poly	0.56305	0.568116	0.593939	0.544444	0.593939	0.534091
svm, poly synthetic samples	0.56305	0.56305	0.581818	0.545455	0.581818	0.545455
svm, poly upsampled	0.565982	0.572254	0.6	0.546961	0.6	0.534091
grid, rbf kernel	0.560117	0.576271	0.618182	0.539683	0.618182	0.505682
grid, rbf kernel synthetic samples	0.571848	0.582857	0.618182	0.551351	0.618182	0.528409
grid, rbf kernel upsampled	0.580645	0.594901	0.636364	0.558511	0.636364	0.528409
grid, sigmoid kernel	0.577713	0.6	0.654545	0.553846	0.654545	0.505682
grid, sigmoid kernel synthetic samples	0.568915	0.588235	0.636364	0.546875	0.636364	0.505682
grid, sigmoid kernel upsampled	0.554252	0.582418	0.642424	0.532663	0.642424	0.471591
random forest estimator	0.627566	0.596825	0.569697	0.626667	0.569697	0.681818
random forest estimator synthetic samples	0.615836	0.576052	0.539394	0.618056	0.539394	0.6875
random forest estimator, upsampled	0.618768	0.630682	0.672727	0.593583	0.672727	0.568182
knn 10	0.577713	0.6	0.654545	0.553846	0.654545	0.505682
knn 10 synthetic samples	0.577713	0.6	0.654545	0.553846	0.654545	0.505682
knn 10 upsampled	0.604106	0.628099	0.690909	0.575758	0.690909	0.522727

TABLE CCXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.741935	0	0	0	0	0.98062
Logistic regression synthetic samples	0.560117	0.369748	0.53012	0.283871	0.53012	0.569767
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.756598	0	0	0	0	1
svm, linear kernel, synthetic samples	0.513196	0.371212	0.590361	0.270718	0.590361	0.488372
svm, linear kernel upsampled samples	0.580645	0.375546	0.518072	0.294521	0.518072	0.600775
svm, poly	0.756598	0	0	0	0	1
svm, poly synthetic samples	0.516129	0.4	0.662651	0.286458	0.662651	0.468992
svm, poly upsampled	0.589443	0.380531	0.518072	0.300699	0.518072	0.612403
grid, rbf kernel	0.756598	0	0	0	0	1
grid, rbf kernel synthetic samples	0.536657	0.401515	0.638554	0.292818	0.638554	0.503876
grid, rbf kernel upsampled	0.554252	0.355932	0.506024	0.27451	0.506024	0.569767
grid, sigmoid kernel	0.73607	0.0625	0.0361446	0.230769	0.0361446	0.96124
grid, sigmoid kernel synthetic samples	0.524927	0.390977	0.626506	0.284153	0.626506	0.492248
grid, sigmoid kernel upsampled	0.56305	0.406375	0.614458	0.303571	0.614458	0.546512
random forest estimator	0.768328	0.091954	0.0481928	1	0.0481928	1
random forest estimator synthetic samples	0.680352	0.369942	0.385542	0.355556	0.385542	0.775194
random forest estimator, upsampled	0.609971	0.414097	0.566265	0.326389	0.566265	0.624031
knn 10	0.756598	0.265487	0.180723	0.5	0.180723	0.94186
knn 10 synthetic samples	0.565982	0.393443	0.578313	0.298137	0.578313	0.562016
knn 10 upsampled	0.589443	0.396552	0.554217	0.308725	0.554217	0.600775

TABLE CCXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 6 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.971347	0.985465	0.997059	0.974138	0.997059	0
Logistic regression synthetic samples	0.719198	0.834459	0.726471	0.980159	0.726471	0.444444
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.971347	0.985465	0.997059	0.974138	0.997059	0
svm, linear kernel, synthetic samples	0.638968	0.775	0.638235	0.986364	0.638235	0.666667
svm, linear kernel upsampled samples	0.707736	0.826531	0.714706	0.979839	0.714706	0.444444
svm, poly	0.971347	0.985465	0.997059	0.974138	0.997059	0
svm, poly synthetic samples	0.710602	0.82735	0.711765	0.987755	0.711765	0.666667
svm, poly upsampled	0.713467	0.829932	0.717647	0.983871	0.717647	0.555556
grid, rbf kernel	0.974212	0.986938	1	0.974212	1	0
grid, rbf kernel synthetic samples	0.851003	0.918239	0.858824	0.986486	0.858824	0.555556
grid, rbf kernel upsampled	0.891117	0.941538	0.9	0.987097	0.9	0.555556
grid, sigmoid kernel	0.974212	0.986938	1	0.974212	1	0
grid, sigmoid kernel synthetic samples	0.604585	0.749091	0.605882	0.980952	0.605882	0.555556
grid, sigmoid kernel upsampled	0.641834	0.777184	0.641176	0.986425	0.641176	0.666667
random forest estimator	0.974212	0.986938	1	0.974212	1	0
random forest estimator synthetic samples	0.922636	0.959276	0.935294	0.98452	0.935294	0.444444
random forest estimator, upsampled	0.968481	0.983847	0.985294	0.982405	0.985294	0.333333
knn 10	0.982808	0.991254	1	0.982659	1	0.333333
knn 10 synthetic samples	0.77937	0.874388	0.788235	0.981685	0.788235	0.444444
knn 10 upsampled	0.856734	0.922118	0.870588	0.980132	0.870588	0.333333

TABLE CCXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.91404	0.95509	0.993769	0.919308	0.993769	0
Logistic regression synthetic samples	0.616046	0.751852	0.632399	0.926941	0.632399	0.428571
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.916905	0.956652	0.996885	0.91954	0.996885	0
svm, linear kernel, synthetic samples	0.613181	0.747664	0.623053	0.934579	0.623053	0.5
svm, linear kernel upsampled samples	0.716332	0.829016	0.747664	0.930233	0.747664	0.357143
svm, poly	0.916905	0.956652	0.996885	0.91954	0.996885	0
svm, poly synthetic samples	0.621777	0.753731	0.629283	0.939535	0.629283	0.535714
svm, poly upsampled	0.739255	0.847571	0.788162	0.916667	0.788162	0.178571
grid, rbf kernel	0.919771	0.958209	1	0.919771	1	0
grid, rbf kernel synthetic samples	0.704871	0.818342	0.722741	0.943089	0.722741	0.5
grid, rbf kernel upsampled	0.790831	0.879339	0.82866	0.93662	0.82866	0.357143
grid, sigmoid kernel	0.916905	0.956652	0.996885	0.91954	0.996885	0
grid, sigmoid kernel synthetic samples	0.587393	0.725191	0.5919	0.935961	0.5919	0.535714
grid, sigmoid kernel upsampled	0.56447	0.706564	0.570093	0.928934	0.570093	0.5
random forest estimator	0.919771	0.958209	1	0.919771	1	0
random forest estimator synthetic samples	0.830946	0.904685	0.872274	0.939597	0.872274	0.357143
random forest estimator, upsampled	0.896848	0.944099	0.94704	0.941176	0.94704	0.321429
knn 10	0.934097	0.965414	1	0.93314	1	0.178571
knn 10 synthetic samples	0.624642	0.75514	0.629283	0.943925	0.629283	0.571429
knn 10 upsampled	0.659026	0.784029	0.672897	0.93913	0.672897	0.5

TABLE CCXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.730659	0.842282	0.976654	0.740413	0.976654	0.0434783
Logistic regression synthetic samples	0.575931	0.682403	0.618677	0.760766	0.618677	0.456522
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.739255	0.849587	1	0.738506	1	0.0108696
svm, linear kernel, synthetic samples	0.581662	0.690678	0.634241	0.75814	0.634241	0.434783
svm, linear kernel upsampled samples	0.601719	0.712215	0.669261	0.761062	0.669261	0.413043
svm, poly	0.74212	0.850498	0.996109	0.742029	0.996109	0.0326087
svm, poly synthetic samples	0.610315	0.721311	0.684825	0.761905	0.684825	0.402174
svm, poly upsampled	0.636103	0.749507	0.7393	0.76	0.7393	0.347826
grid, rbf kernel	0.739255	0.849088	0.996109	0.739884	0.996109	0.0217391
grid, rbf kernel synthetic samples	0.644699	0.745902	0.708171	0.787879	0.708171	0.467391
grid, rbf kernel upsampled	0.679083	0.782946	0.785992	0.779923	0.785992	0.380435
grid, sigmoid kernel	0.704871	0.825127	0.945525	0.731928	0.945525	0.0326087
grid, sigmoid kernel synthetic samples	0.584527	0.682713	0.607004	0.78	0.607004	0.521739
grid, sigmoid kernel upsampled	0.532951	0.638581	0.560311	0.742268	0.560311	0.456522
random forest estimator	0.730659	0.843333	0.984436	0.737609	0.984436	0.0217391
random forest estimator synthetic samples	0.659026	0.765286	0.754864	0.776	0.754864	0.391304
random forest estimator, upsampled	0.707736	0.809701	0.844358	0.777778	0.844358	0.326087
knn 10	0.730659	0.837931	0.945525	0.752322	0.945525	0.130435
knn 10 synthetic samples	0.561605	0.672377	0.610895	0.747619	0.610895	0.423913
knn 10 upsampled	0.618911	0.728016	0.692607	0.767241	0.692607	0.413043

TABLE CCXXX: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.584527	0.607046	0.64	0.57732	0.64	0.528736
Logistic regression synthetic samples	0.581662	0.598901	0.622857	0.57672	0.622857	0.54023
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.578797	0.595041	0.617143	0.574468	0.617143	0.54023
svm, linear kernel, synthetic samples	0.590258	0.612466	0.645714	0.582474	0.645714	0.534483
svm, linear kernel upsampled samples	0.570201	0.615385	0.685714	0.55814	0.685714	0.454023
svm, poly	0.587393	0.619048	0.668571	0.576355	0.668571	0.505747
svm, poly synthetic samples	0.581662	0.623711	0.691429	0.568075	0.691429	0.471264
svm, poly upsampled	0.590258	0.643392	0.737143	0.570796	0.737143	0.442529
grid, rbf kernel	0.578797	0.616188	0.674286	0.567308	0.674286	0.482759
grid, rbf kernel synthetic samples	0.590258	0.639798	0.725714	0.572072	0.725714	0.454023
grid, rbf kernel upsampled	0.558739	0.636792	0.771429	0.542169	0.771429	0.344828
grid, sigmoid kernel	0.616046	0.623596	0.634286	0.61326	0.634286	0.597701
grid, sigmoid kernel synthetic samples	0.613181	0.630137	0.657143	0.605263	0.657143	0.568966
grid, sigmoid kernel upsampled	0.616046	0.645503	0.697143	0.600985	0.697143	0.534483
random forest estimator	0.60745	0.593472	0.571429	0.617284	0.571429	0.643678
random forest estimator synthetic samples	0.610315	0.6	0.582857	0.618182	0.582857	0.637931
random forest estimator, upsampled	0.590258	0.628571	0.691429	0.57619	0.691429	0.488506
knn 10	0.581662	0.592179	0.605714	0.579235	0.605714	0.557471
knn 10 synthetic samples	0.584527	0.598338	0.617143	0.580645	0.617143	0.551724
knn 10 upsampled	0.578797	0.612137	0.662857	0.568627	0.662857	0.494253

TABLE CCXXXI: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.74212	0.0217391	0.0113636	0.25	0.0113636	0.988506
Logistic regression synthetic samples	0.56447	0.396825	0.568182	0.304878	0.568182	0.563218
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.747851	0	0	0	0	1
svm, linear kernel, synthetic samples	0.553009	0.4	0.590909	0.302326	0.590909	0.54023
svm, linear kernel upsampled samples	0.475645	0.348754	0.556818	0.253886	0.556818	0.448276
svm, poly	0.747851	0	0	0	0	1
svm, poly synthetic samples	0.518625	0.382353	0.590909	0.282609	0.590909	0.494253
svm, poly upsampled	0.475645	0.353357	0.568182	0.25641	0.568182	0.444444
grid, rbf kernel	0.747851	0	0	0	0	1
grid, rbf kernel synthetic samples	0.538682	0.363636	0.522727	0.278788	0.522727	0.544061
grid, rbf kernel upsampled	0.501433	0.369565	0.579545	0.271277	0.579545	0.475096
grid, sigmoid kernel	0.727794	0.040404	0.0227273	0.181818	0.0227273	0.965517
grid, sigmoid kernel synthetic samples	0.504298	0.397213	0.647727	0.286432	0.647727	0.455939
grid, sigmoid kernel upsampled	0.464183	0.382838	0.659091	0.269767	0.659091	0.398467
random forest estimator	0.753582	0.0444444	0.0227273	1	0.0227273	1
random forest estimator synthetic samples	0.613181	0.150943	0.136364	0.169014	0.136364	0.773946
random forest estimator, upsampled	0.504298	0.337165	0.5	0.254335	0.5	0.505747
knn 10	0.74212	0.166667	0.102273	0.45	0.102273	0.957854
knn 10 synthetic samples	0.535817	0.307692	0.409091	0.246575	0.409091	0.578544
knn 10 upsampled	0.547278	0.362903	0.511364	0.28125	0.511364	0.559387

TABLE CCXXXII: Numerical results of ML methods, using data between time of birth - time of birth + 7 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.960784	0.98	1	0.960784	1	0
Logistic regression synthetic samples	0.708683	0.827815	0.728863	0.957854	0.728863	0.214286
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.960784	0.98	1	0.960784	1	0
svm, linear kernel, synthetic samples	0.663866	0.793814	0.673469	0.966527	0.673469	0.428571
svm, linear kernel upsampled samples	0.633053	0.771379	0.644315	0.96087	0.644315	0.357143
svm, poly	0.960784	0.98	1	0.960784	1	0
svm, poly synthetic samples	0.689076	0.813445	0.705539	0.960317	0.705539	0.285714
svm, poly upsampled	0.655462	0.789022	0.670554	0.958333	0.670554	0.285714
grid, rbf kernel	0.960784	0.98	1	0.960784	1	0
grid, rbf kernel synthetic samples	0.829132	0.906009	0.857143	0.960784	0.857143	0.142857
grid, rbf kernel upsampled	0.87395	0.932331	0.90379	0.962733	0.90379	0.142857
grid, sigmoid kernel	0.955182	0.976945	0.988338	0.965812	0.988338	0.142857
grid, sigmoid kernel synthetic samples	0.504202	0.660269	0.501458	0.966292	0.501458	0.571429
grid, sigmoid kernel upsampled	0.453782	0.610778	0.446064	0.968354	0.446064	0.642857
random forest estimator	0.960784	0.98	1	0.960784	1	0
random forest estimator synthetic samples	0.935574	0.966618	0.970845	0.962428	0.970845	0.0714286
random forest estimator, upsampled	0.963585	0.981402	1	0.963483	1	0.0714286
knn 10	0.963585	0.981402	1	0.963483	1	0.0714286
knn 10 synthetic samples	0.770308	0.86901	0.793003	0.961131	0.793003	0.214286
knn 10 upsampled	0.859944	0.924242	0.889213	0.962145	0.889213	0.142857

TABLE CCXXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.885154	0.938897	0.993691	0.889831	0.993691	0.025
Logistic regression synthetic samples	0.630252	0.76	0.659306	0.896996	0.659306	0.4
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.887955	0.940653	1	0.887955	1	0
svm, linear kernel, synthetic samples	0.59944	0.734694	0.624606	0.891892	0.624606	0.4
svm, linear kernel upsampled samples	0.683473	0.802792	0.725552	0.898438	0.725552	0.35
svm, poly	0.887955	0.940476	0.996845	0.890141	0.996845	0.025
svm, poly synthetic samples	0.621849	0.752294	0.646688	0.899123	0.646688	0.425
svm, poly upsampled	0.717087	0.827939	0.766562	0.9	0.766562	0.325
grid, rbf kernel	0.887955	0.940653	1	0.887955	1	0
grid, rbf kernel synthetic samples	0.663866	0.788732	0.706625	0.89243	0.706625	0.325
grid, rbf kernel upsampled	0.753501	0.855738	0.823344	0.890785	0.823344	0.2
grid, sigmoid kernel	0.871148	0.930723	0.974763	0.89049	0.974763	0.05
grid, sigmoid kernel synthetic samples	0.551821	0.688716	0.55836	0.898477	0.55836	0.5
grid, sigmoid kernel upsampled	0.633053	0.76225	0.662461	0.897436	0.662461	0.4
random forest estimator	0.887955	0.940653	1	0.887955	1	0
random forest estimator synthetic samples	0.826331	0.903727	0.917981	0.889908	0.917981	0.1
random forest estimator, upsampled	0.871148	0.930303	0.968454	0.895044	0.968454	0.1
knn 10	0.896359	0.944858	1	0.89548	1	0.075
knn 10 synthetic samples	0.641457	0.765568	0.659306	0.912664	0.659306	0.5
knn 10 upsampled	0.652661	0.775362	0.675079	0.910638	0.675079	0.475

TABLE CCXXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.705882	0.825291	0.992	0.706553	0.992	0.0373832
Logistic regression synthetic samples	0.577031	0.668132	0.608	0.741463	0.608	0.504673
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.70028	0.823723	1	0.70028	1	0
svm, linear kernel, synthetic samples	0.560224	0.654945	0.596	0.726829	0.596	0.476636
svm, linear kernel upsampled samples	0.605042	0.711656	0.696	0.728033	0.696	0.392523
svm, poly	0.697479	0.821192	0.992	0.700565	0.992	0.00934579
svm, poly synthetic samples	0.563025	0.656388	0.596	0.730392	0.596	0.485981
svm, poly upsampled	0.616246	0.713987	0.684	0.746725	0.684	0.457944
grid, rbf kernel	0.703081	0.825083	1	0.702247	1	0.00934579
grid, rbf kernel synthetic samples	0.554622	0.652079	0.596	0.719807	0.596	0.457944
grid, rbf kernel upsampled	0.605042	0.705637	0.676	0.737991	0.676	0.439252
grid, sigmoid kernel	0.70028	0.820168	0.976	0.707246	0.976	0.0560748
grid, sigmoid kernel synthetic samples	0.529412	0.601896	0.508	0.738372	0.508	0.579439
grid, sigmoid kernel upsampled	0.537815	0.617169	0.532	0.734807	0.532	0.551402
random forest estimator	0.70028	0.823723	1	0.70028	1	0
random forest estimator synthetic samples	0.635854	0.738956	0.736	0.741935	0.736	0.401869
random forest estimator, upsampled	0.694678	0.799263	0.868	0.740614	0.868	0.28972
knn 10	0.691877	0.809689	0.936	0.713415	0.936	0.121495
knn 10 synthetic samples	0.557423	0.642534	0.568	0.739583	0.568	0.53271
knn 10 upsampled	0.602241	0.701681	0.668	0.738938	0.668	0.448598

TABLE CCXXXV: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.532213	0.542466	0.614907	0.485294	0.614907	0.464286
Logistic regression synthetic samples	0.571429	0.540541	0.559006	0.523256	0.559006	0.581633
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.543417	0.560647	0.645963	0.495238	0.645963	0.459184
svm, linear kernel, synthetic samples	0.557423	0.540698	0.57764	0.508197	0.57764	0.540816
svm, linear kernel upsampled samples	0.551821	0.542857	0.590062	0.502646	0.590062	0.520408
svm, poly	0.540616	0.566138	0.664596	0.493088	0.664596	0.438776
svm, poly synthetic samples	0.57423	0.547619	0.571429	0.525714	0.571429	0.576531
svm, poly upsampled	0.565826	0.560907	0.614907	0.515625	0.614907	0.52551
grid, rbf kernel	0.540616	0.551913	0.627329	0.492683	0.627329	0.469388
grid, rbf kernel synthetic samples	0.554622	0.522523	0.540373	0.505814	0.540373	0.566327
grid, rbf kernel upsampled	0.526611	0.504399	0.534161	0.477778	0.534161	0.520408
grid, sigmoid kernel	0.532213	0.544959	0.621118	0.485437	0.621118	0.459184
grid, sigmoid kernel synthetic samples	0.54902	0.519403	0.540373	0.5	0.540373	0.556122
grid, sigmoid kernel upsampled	0.521008	0.510029	0.552795	0.473404	0.552795	0.494898
random forest estimator	0.596639	0.576471	0.608696	0.547486	0.608696	0.586735
random forest estimator synthetic samples	0.621849	0.579439	0.57764	0.58125	0.57764	0.658163
random forest estimator, upsampled	0.591036	0.596685	0.670807	0.537313	0.670807	0.52551
knn 10	0.568627	0.567416	0.627329	0.517949	0.627329	0.520408
knn 10 synthetic samples	0.557423	0.529762	0.552795	0.508571	0.552795	0.561224
knn 10 upsampled	0.551821	0.548023	0.602484	0.502591	0.602484	0.510204

TABLE CCXXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.764706	0.0869565	0.047619	0.5	0.047619	0.985348
Logistic regression synthetic samples	0.526611	0.34749	0.535714	0.257143	0.535714	0.52381
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.764706	0	0	0	0	1
svm, linear kernel, synthetic samples	0.498599	0.358423	0.595238	0.25641	0.595238	0.468864
svm, linear kernel upsampled samples	0.540616	0.349206	0.52381	0.261905	0.52381	0.545788
svm, poly	0.759104	0	0	0	0	0.992674
svm, poly synthetic samples	0.515406	0.375451	0.619048	0.26943	0.619048	0.483516
svm, poly upsampled	0.478992	0.340426	0.571429	0.242424	0.571429	0.450549
grid, rbf kernel	0.764706	0	0	0	0	1
grid, rbf kernel synthetic samples	0.501401	0.350365	0.571429	0.252632	0.571429	0.479853
grid, rbf kernel upsampled	0.52381	0.356061	0.559524	0.261111	0.559524	0.512821
grid, sigmoid kernel	0.759104	0.0851064	0.047619	0.4	0.047619	0.978022
grid, sigmoid kernel synthetic samples	0.546218	0.381679	0.595238	0.280899	0.595238	0.531136
grid, sigmoid kernel upsampled	0.515406	0.370909	0.607143	0.267016	0.607143	0.487179
random forest estimator	0.770308	0.0465116	0.0238095	1	0.0238095	1
random forest estimator synthetic samples	0.672269	0.290909	0.285714	0.296296	0.285714	0.791209
random forest estimator, upsampled	0.554622	0.371542	0.559524	0.278107	0.559524	0.553114
knn 10	0.753501	0.169811	0.107143	0.409091	0.107143	0.952381
knn 10 synthetic samples	0.57423	0.355932	0.5	0.276316	0.5	0.59707
knn 10 upsampled	0.565826	0.317181	0.428571	0.251748	0.428571	0.608059

TABLE CCXXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 8 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.956044	0.977528	0.997135	0.958678	0.997135	0
Logistic regression synthetic samples	0.733516	0.843296	0.747851	0.966667	0.747851	0.4
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.958791	0.978962	1	0.958791	1	0
svm, linear kernel, synthetic samples	0.708791	0.825658	0.719198	0.969112	0.719198	0.466667
svm, linear kernel upsampled samples	0.711538	0.827018	0.719198	0.972868	0.719198	0.533333
svm, poly	0.958791	0.978962	1	0.958791	1	0
svm, poly synthetic samples	0.730769	0.841424	0.744986	0.966543	0.744986	0.4
svm, poly upsampled	0.706044	0.82314	0.713467	0.972656	0.713467	0.533333
grid, rbf kernel	0.958791	0.978962	1	0.958791	1	0
grid, rbf kernel synthetic samples	0.837912	0.91047	0.859599	0.967742	0.859599	0.333333
grid, rbf kernel upsampled	0.85989	0.923538	0.882521	0.968553	0.882521	0.333333
grid, sigmoid kernel	0.953297	0.97609	0.994269	0.958564	0.994269	0
grid, sigmoid kernel synthetic samples	0.634615	0.770294	0.638968	0.969565	0.638968	0.533333
grid, sigmoid kernel upsampled	0.623626	0.762565	0.630372	0.964912	0.630372	0.466667
random forest estimator	0.958791	0.978962	1	0.958791	1	0
random forest estimator synthetic samples	0.928571	0.962536	0.95702	0.968116	0.95702	0.266667
random forest estimator, upsampled	0.967033	0.983051	0.997135	0.969359	0.997135	0.266667
knn 10	0.96978	0.984485	1	0.969444	1	0.266667
knn 10 synthetic samples	0.777473	0.872441	0.793696	0.968531	0.793696	0.4
knn 10 upsampled	0.881868	0.936107	0.902579	0.972222	0.902579	0.4

TABLE CCXXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.892857	0.943396	0.996933	0.895317	0.996933	0
Logistic regression synthetic samples	0.60989	0.742754	0.628834	0.90708	0.628834	0.447368
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.895604	0.944928	1	0.895604	1	0
svm, linear kernel, synthetic samples	0.607143	0.740472	0.625767	0.906667	0.625767	0.447368
svm, linear kernel upsampled samples	0.730769	0.839869	0.788344	0.898601	0.788344	0.236842
svm, poly	0.895604	0.944928	1	0.895604	1	0
svm, poly synthetic samples	0.634615	0.762923	0.656442	0.910638	0.656442	0.447368
svm, poly upsampled	0.728022	0.838499	0.788344	0.89547	0.788344	0.210526
grid, rbf kernel	0.895604	0.944928	1	0.895604	1	0
grid, rbf kernel synthetic samples	0.60989	0.74552	0.638037	0.896552	0.638037	0.368421
grid, rbf kernel upsampled	0.706044	0.822554	0.760736	0.895307	0.760736	0.236842
grid, sigmoid kernel	0.892857	0.943231	0.993865	0.897507	0.993865	0.0263158
grid, sigmoid kernel synthetic samples	0.538462	0.675676	0.53681	0.911458	0.53681	0.552632
grid, sigmoid kernel upsampled	0.532967	0.67433	0.539877	0.897959	0.539877	0.473684
random forest estimator	0.895604	0.944928	1	0.895604	1	0
random forest estimator synthetic samples	0.824176	0.900621	0.889571	0.91195	0.889571	0.263158
random forest estimator, upsampled	0.873626	0.931343	0.957055	0.906977	0.957055	0.157895
knn 10	0.906593	0.950147	0.993865	0.910112	0.993865	0.157895
knn 10 synthetic samples	0.675824	0.795139	0.702454	0.916	0.702454	0.447368
knn 10 upsampled	0.706044	0.818336	0.739264	0.91635	0.739264	0.421053

TABLE CCXXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.717033	0.831974	0.973282	0.726496	0.973282	0.0588235
Logistic regression synthetic samples	0.593407	0.692946	0.637405	0.759091	0.637405	0.480392
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.725275	0.83871	0.992366	0.726257	0.992366	0.0392157
svm, linear kernel, synthetic samples	0.593407	0.705179	0.675573	0.7375	0.675573	0.382353
svm, linear kernel upsampled samples	0.585165	0.70099	0.675573	0.728395	0.675573	0.352941
svm, poly	0.725275	0.839744	1	0.723757	1	0.0196078
svm, poly synthetic samples	0.629121	0.72837	0.69084	0.770213	0.69084	0.470588
svm, poly upsampled	0.585165	0.704501	0.687023	0.722892	0.687023	0.323529
grid, rbf kernel	0.722527	0.8384	1	0.721763	1	0.00980392
grid, rbf kernel synthetic samples	0.634615	0.736634	0.709924	0.765432	0.709924	0.441176
grid, rbf kernel upsampled	0.604396	0.724138	0.721374	0.726923	0.721374	0.303922
grid, sigmoid kernel	0.725275	0.839744	1	0.723757	1	0.0196078
grid, sigmoid kernel synthetic samples	0.604396	0.713147	0.683206	0.745833	0.683206	0.401961
grid, sigmoid kernel upsampled	0.543956	0.640693	0.564885	0.74	0.564885	0.490196
random forest estimator	0.71978	0.837061	1	0.71978	1	0
random forest estimator synthetic samples	0.637363	0.746154	0.740458	0.751938	0.740458	0.372549
random forest estimator, upsampled	0.681319	0.795053	0.858779	0.740132	0.858779	0.22549
knn 10	0.706044	0.820771	0.935115	0.731343	0.935115	0.117647
knn 10 synthetic samples	0.554945	0.646288	0.564885	0.755102	0.564885	0.529412
knn 10 upsampled	0.576923	0.683128	0.633588	0.741071	0.633588	0.431373

TABLE CCXL: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.552198	0.567639	0.557292	0.578378	0.557292	0.546512
Logistic regression synthetic samples	0.56044	0.593909	0.609375	0.579208	0.609375	0.505814
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.565934	0.588542	0.588542	0.588542	0.588542	0.540698
svm, linear kernel, synthetic samples	0.576923	0.613065	0.635417	0.592233	0.635417	0.511628
svm, linear kernel upsampled samples	0.582418	0.623762	0.65625	0.59434	0.65625	0.5
svm, poly	0.56044	0.587629	0.59375	0.581633	0.59375	0.523256
svm, poly synthetic samples	0.571429	0.621359	0.666667	0.581818	0.666667	0.465116
svm, poly upsampled	0.601648	0.640199	0.671875	0.611374	0.671875	0.523256
grid, rbf kernel	0.571429	0.587302	0.578125	0.596774	0.578125	0.563953
grid, rbf kernel synthetic samples	0.607143	0.646914	0.682292	0.615023	0.682292	0.523256
grid, rbf kernel upsampled	0.596154	0.631579	0.65625	0.608696	0.65625	0.52907
grid, sigmoid kernel	0.563187	0.584856	0.583333	0.586387	0.583333	0.540698
grid, sigmoid kernel synthetic samples	0.541209	0.587654	0.619792	0.558685	0.619792	0.453488
grid, sigmoid kernel upsampled	0.554945	0.597015	0.625	0.571429	0.625	0.476744
random forest estimator	0.582418	0.591398	0.572917	0.611111	0.572917	0.593023
random forest estimator synthetic samples	0.601648	0.615385	0.604167	0.627027	0.604167	0.598837
random forest estimator, upsampled	0.571429	0.640553	0.723958	0.57438	0.723958	0.401163
knn 10	0.541209	0.534819	0.5	0.57485	0.5	0.587209
knn 10 synthetic samples	0.549451	0.556757	0.536458	0.578652	0.536458	0.563953
knn 10 upsampled	0.571429	0.571429	0.541667	0.604651	0.541667	0.604651

TABLE CCXLI: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.75	0.0421053	0.0217391	0.666667	0.0217391	0.996324
Logistic regression synthetic samples	0.532967	0.401408	0.619565	0.296875	0.619565	0.503676
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.747253	0	0	0	0	1
svm, linear kernel, synthetic samples	0.453297	0.376176	0.652174	0.264317	0.652174	0.386029
svm, linear kernel upsampled samples	0.456044	0.388889	0.684783	0.271552	0.684783	0.378676
svm, poly	0.747253	0.0212766	0.0108696	0.5	0.0108696	0.996324
svm, poly synthetic samples	0.43956	0.385542	0.695652	0.266667	0.695652	0.352941
svm, poly upsampled	0.467033	0.401235	0.706522	0.280172	0.706522	0.386029
grid, rbf kernel	0.747253	0	0	0	0	1
grid, rbf kernel synthetic samples	0.447802	0.361905	0.619565	0.255605	0.619565	0.389706
grid, rbf kernel upsampled	0.478022	0.417178	0.73913	0.290598	0.73913	0.389706
grid, sigmoid kernel	0.744505	0.130841	0.076087	0.466667	0.076087	0.970588
grid, sigmoid kernel synthetic samples	0.521978	0.378571	0.576087	0.281915	0.576087	0.503676
grid, sigmoid kernel upsampled	0.436813	0.38806	0.706522	0.26749	0.706522	0.345588
random forest estimator	0.75	0.0215054	0.0108696	1	0.0108696	1
random forest estimator synthetic samples	0.664835	0.344086	0.347826	0.340426	0.347826	0.772059
random forest estimator, upsampled	0.491758	0.389439	0.641304	0.279621	0.641304	0.441176
knn 10	0.763736	0.232143	0.141304	0.65	0.141304	0.974265
knn 10 synthetic samples	0.593407	0.430769	0.608696	0.333333	0.608696	0.588235
knn 10 upsampled	0.571429	0.4	0.565217	0.309524	0.565217	0.573529

TABLE CCXLII: Numerical results of ML methods, using data between time of birth - time of birth + 9 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.95393	0.976422	0.997167	0.956522	0.997167	0
Logistic regression synthetic samples	0.647696	0.780405	0.654391	0.966527	0.654391	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.95664	0.977839	1	0.95664	1	0
svm, linear kernel, synthetic samples	0.593496	0.734043	0.586402	0.981043	0.586402	0.75
svm, linear kernel upsampled samples	0.636856	0.768966	0.631728	0.982379	0.631728	0.75
svm, poly	0.95664	0.977839	1	0.95664	1	0
svm, poly synthetic samples	0.620596	0.756944	0.617564	0.977578	0.617564	0.6875
svm, poly upsampled	0.653117	0.784512	0.660057	0.966805	0.660057	0.5
grid, rbf kernel	0.95664	0.977839	1	0.95664	1	0
grid, rbf kernel synthetic samples	0.794038	0.882353	0.807365	0.972696	0.807365	0.5
grid, rbf kernel upsampled	0.872629	0.930576	0.892351	0.972222	0.892351	0.4375
grid, sigmoid kernel	0.95122	0.975	0.994334	0.956403	0.994334	0
grid, sigmoid kernel synthetic samples	0.544715	0.694545	0.541076	0.969543	0.541076	0.625
grid, sigmoid kernel upsampled	0.547425	0.699099	0.549575	0.960396	0.549575	0.5
random forest estimator	0.95664	0.977839	1	0.95664	1	0
random forest estimator synthetic samples	0.932249	0.964639	0.966006	0.963277	0.966006	0.1875
random forest estimator, upsampled	0.95935	0.979138	0.997167	0.961749	0.997167	0.125
knn 10	0.96206	0.980556	1	0.961853	1	0.125
knn 10 synthetic samples	0.739837	0.847134	0.753541	0.967273	0.753541	0.4375
knn 10 upsampled	0.861789	0.924668	0.886686	0.966049	0.886686	0.3125

TABLE CCXLIII: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.883469	0.938129	1	0.883469	1	0
Logistic regression synthetic samples	0.601626	0.73703	0.631902	0.88412	0.631902	0.372093
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.883469	0.938129	1	0.883469	1	0
svm, linear kernel, synthetic samples	0.555556	0.692884	0.567485	0.889423	0.567485	0.465116
svm, linear kernel upsampled samples	0.666667	0.791878	0.717791	0.883019	0.717791	0.27907
svm, poly	0.880759	0.936599	0.996933	0.883152	0.996933	0
svm, poly synthetic samples	0.604336	0.73741	0.628834	0.891304	0.628834	0.418605
svm, poly upsampled	0.723577	0.833333	0.782209	0.891608	0.782209	0.27907
grid, rbf kernel	0.883469	0.938129	1	0.883469	1	0
grid, rbf kernel synthetic samples	0.517615	0.657692	0.52454	0.881443	0.52454	0.465116
grid, rbf kernel upsampled	0.723577	0.832787	0.779141	0.894366	0.779141	0.302326
grid, sigmoid kernel	0.878049	0.934688	0.98773	0.887052	0.98773	0.0465116
grid, sigmoid kernel synthetic samples	0.466125	0.598778	0.45092	0.890909	0.45092	0.581395
grid, sigmoid kernel upsampled	0.528455	0.664093	0.527607	0.895833	0.527607	0.534884
random forest estimator	0.883469	0.938129	1	0.883469	1	0
random forest estimator synthetic samples	0.810298	0.891975	0.886503	0.897516	0.886503	0.232558
random forest estimator, upsampled	0.880759	0.935673	0.981595	0.893855	0.981595	0.116279
knn 10	0.891599	0.942029	0.996933	0.892857	0.996933	0.0930233
knn 10 synthetic samples	0.593496	0.730216	0.622699	0.882609	0.622699	0.372093
knn 10 upsampled	0.620596	0.754386	0.659509	0.881148	0.659509	0.325581

TABLE CCXLIV: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.723577	0.838095	0.977778	0.733333	0.977778	0.030303
Logistic regression synthetic samples	0.596206	0.700201	0.644444	0.76652	0.644444	0.464646
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.734417	0.846395	1	0.733696	1	0.010101
svm, linear kernel, synthetic samples	0.607046	0.712871	0.666667	0.765957	0.666667	0.444444
svm, linear kernel upsampled samples	0.620596	0.72	0.666667	0.782609	0.666667	0.494949
svm, poly	0.728997	0.84326	0.996296	0.730978	0.996296	0
svm, poly synthetic samples	0.617886	0.721893	0.677778	0.772152	0.677778	0.454545
svm, poly upsampled	0.647696	0.752852	0.733333	0.773438	0.733333	0.414141
grid, rbf kernel	0.734417	0.846395	1	0.733696	1	0.010101
grid, rbf kernel synthetic samples	0.528455	0.635983	0.562963	0.730769	0.562963	0.434343
grid, rbf kernel upsampled	0.566396	0.68254	0.637037	0.735043	0.637037	0.373737
grid, sigmoid kernel	0.720867	0.836767	0.977778	0.731302	0.977778	0.020202
grid, sigmoid kernel synthetic samples	0.579946	0.686869	0.62963	0.755556	0.62963	0.444444
grid, sigmoid kernel upsampled	0.514905	0.586605	0.47037	0.779141	0.47037	0.636364
random forest estimator	0.728997	0.842767	0.992593	0.73224	0.992593	0.010101
random forest estimator synthetic samples	0.612466	0.727619	0.707407	0.74902	0.707407	0.353535
random forest estimator, upsampled	0.663957	0.783217	0.82963	0.741722	0.82963	0.212121
knn 10	0.723577	0.832237	0.937037	0.748521	0.937037	0.141414
knn 10 synthetic samples	0.582656	0.684426	0.618519	0.766055	0.618519	0.484848
knn 10 upsampled	0.582656	0.689516	0.633333	0.756637	0.633333	0.444444

TABLE CCXLV: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.585366	0.602597	0.655367	0.557692	0.655367	0.520833
Logistic regression synthetic samples	0.577236	0.587302	0.627119	0.552239	0.627119	0.53125
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.577236	0.606061	0.677966	0.547945	0.677966	0.484375
svm, linear kernel, synthetic samples	0.579946	0.601542	0.661017	0.551887	0.661017	0.505208
svm, linear kernel upsampled samples	0.579946	0.613466	0.694915	0.549107	0.694915	0.473958
svm, poly	0.569106	0.601504	0.677966	0.540541	0.677966	0.46875
svm, poly synthetic samples	0.560976	0.586735	0.649718	0.534884	0.649718	0.479167
svm, poly upsampled	0.558266	0.627002	0.774011	0.526923	0.774011	0.359375
grid, rbf kernel	0.552846	0.582278	0.649718	0.527523	0.649718	0.463542
grid, rbf kernel synthetic samples	0.558266	0.580977	0.638418	0.533019	0.638418	0.484375
grid, rbf kernel upsampled	0.533875	0.59434	0.711864	0.510121	0.711864	0.369792
grid, sigmoid kernel	0.512195	0.552239	0.627119	0.493333	0.627119	0.40625
grid, sigmoid kernel synthetic samples	0.525745	0.559194	0.627119	0.504545	0.627119	0.432292
grid, sigmoid kernel upsampled	0.550136	0.541436	0.553672	0.52973	0.553672	0.546875
random forest estimator	0.555556	0.556757	0.581921	0.533679	0.581921	0.53125
random forest estimator synthetic samples	0.552846	0.555256	0.581921	0.530928	0.581921	0.526042
random forest estimator, upsampled	0.601626	0.638821	0.734463	0.565217	0.734463	0.479167
knn 10	0.552846	0.547945	0.564972	0.531915	0.564972	0.541667
knn 10 synthetic samples	0.552846	0.547945	0.564972	0.531915	0.564972	0.541667
knn 10 upsampled	0.560976	0.569149	0.60452	0.537688	0.60452	0.520833

TABLE CCXLVI: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.756098	0.0217391	0.0114943	0.2	0.0114943	0.985816
Logistic regression synthetic samples	0.531165	0.401384	0.666667	0.287129	0.666667	0.489362
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.761518	0	0	0	0	0.996454
svm, linear kernel, synthetic samples	0.498645	0.427245	0.793103	0.292373	0.793103	0.407801
svm, linear kernel upsampled samples	0.528455	0.360294	0.563218	0.264865	0.563218	0.51773
svm, poly	0.758808	0	0	0	0	0.992908
svm, poly synthetic samples	0.509485	0.432602	0.793103	0.297414	0.793103	0.421986
svm, poly upsampled	0.531165	0.384342	0.62069	0.278351	0.62069	0.503546
grid, rbf kernel	0.764228	0	0	0	0	1
grid, rbf kernel synthetic samples	0.520325	0.40404	0.689655	0.285714	0.689655	0.468085
grid, rbf kernel upsampled	0.571816	0.261682	0.321839	0.220472	0.321839	0.648936
grid, sigmoid kernel	0.747967	0.0412371	0.0229885	0.2	0.0229885	0.971631
grid, sigmoid kernel synthetic samples	0.531165	0.405498	0.678161	0.289216	0.678161	0.485816
grid, sigmoid kernel upsampled	0.696477	0.308642	0.287356	0.333333	0.287356	0.822695
random forest estimator	0.772358	0.0666667	0.0344828	1	0.0344828	1
random forest estimator synthetic samples	0.636856	0.316327	0.356322	0.284404	0.356322	0.723404
random forest estimator, upsampled	0.493225	0.315018	0.494253	0.231183	0.494253	0.492908
knn 10	0.761518	0.241379	0.16092	0.482759	0.16092	0.946809
knn 10 synthetic samples	0.542005	0.337255	0.494253	0.255952	0.494253	0.556738
knn 10 upsampled	0.550136	0.29661	0.402299	0.234899	0.402299	0.595745

TABLE CCXLVII: Numerical results of ML methods, using data between time of birth - time of birth + 10 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.952	0.97541	1	0.952	1	0
Logistic regression synthetic samples	0.661333	0.793496	0.683473	0.945736	0.683473	0.222222
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.952	0.97541	1	0.952	1	0
svm, linear kernel, synthetic samples	0.658667	0.791531	0.680672	0.945525	0.680672	0.222222
svm, linear kernel upsampled samples	0.648	0.779264	0.652661	0.966805	0.652661	0.555556
svm, poly	0.952	0.97541	1	0.952	1	0
svm, poly synthetic samples	0.688	0.811594	0.705882	0.954545	0.705882	0.333333
svm, poly upsampled	0.677333	0.801964	0.686275	0.964567	0.686275	0.5
grid, rbf kernel	0.952	0.97541	1	0.952	1	0
grid, rbf kernel synthetic samples	0.824	0.902367	0.854342	0.956113	0.854342	0.222222
grid, rbf kernel upsampled	0.869333	0.929496	0.904762	0.955621	0.904762	0.166667
grid, sigmoid kernel	0.949333	0.974008	0.997199	0.951872	0.997199	0
grid, sigmoid kernel synthetic samples	0.570667	0.719023	0.577031	0.953704	0.577031	0.444444
grid, sigmoid kernel upsampled	0.442667	0.595745	0.431373	0.9625	0.431373	0.666667
random forest estimator	0.952	0.97541	1	0.952	1	0
random forest estimator synthetic samples	0.938667	0.968276	0.983193	0.953804	0.983193	0.0555556
random forest estimator, upsampled	0.952	0.975342	0.997199	0.954424	0.997199	0.0555556
knn 10	0.954667	0.976744	1	0.954545	1	0.0555556
knn 10 synthetic samples	0.736	0.845554	0.759104	0.954225	0.759104	0.277778
knn 10 upsampled	0.861333	0.924855	0.896359	0.955224	0.896359	0.166667

TABLE CCXLVIII: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.888	0.940341	1	0.887399	1	0.0454545
Logistic regression synthetic samples	0.533333	0.674115	0.546828	0.878641	0.546828	0.431818
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.882667	0.937677	1	0.882667	1	0
svm, linear kernel, synthetic samples	0.52	0.661654	0.531722	0.875622	0.531722	0.431818
svm, linear kernel upsampled samples	0.626667	0.757785	0.661631	0.88664	0.661631	0.363636
svm, poly	0.885333	0.938834	0.996979	0.887097	0.996979	0.0454545
svm, poly synthetic samples	0.549333	0.689908	0.567976	0.878505	0.567976	0.409091
svm, poly upsampled	0.653333	0.781145	0.700906	0.882129	0.700906	0.295455
grid, rbf kernel	0.885333	0.939007	1	0.885027	1	0.0227273
grid, rbf kernel synthetic samples	0.650667	0.7753	0.682779	0.896825	0.682779	0.409091
grid, rbf kernel upsampled	0.712	0.821782	0.752266	0.905455	0.752266	0.409091
grid, sigmoid kernel	0.874667	0.932953	0.987915	0.883784	0.987915	0.0227273
grid, sigmoid kernel synthetic samples	0.501333	0.641075	0.504532	0.878947	0.504532	0.477273
grid, sigmoid kernel upsampled	0.52	0.655172	0.516616	0.895288	0.516616	0.545455
random forest estimator	0.882667	0.937677	1	0.882667	1	0
random forest estimator synthetic samples	0.832	0.90611	0.918429	0.894118	0.918429	0.181818
random forest estimator, upsampled	0.866667	0.927536	0.966767	0.891365	0.966767	0.113636
knn 10	0.893333	0.94302	1	0.892183	1	0.0909091
knn 10 synthetic samples	0.669333	0.786207	0.688822	0.915663	0.688822	0.522727
knn 10 upsampled	0.690667	0.804054	0.719033	0.911877	0.719033	0.477273

TABLE CCXLIX: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.693333	0.814815	0.947566	0.714689	0.947566	0.0648148
Logistic regression synthetic samples	0.501333	0.587196	0.498127	0.715054	0.498127	0.509259
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.712	0.831776	1	0.712	1	0
svm, linear kernel, synthetic samples	0.472	0.545872	0.445693	0.704142	0.445693	0.537037
svm, linear kernel upsampled samples	0.52	0.612069	0.531835	0.720812	0.531835	0.490741
svm, poly	0.72	0.835681	1	0.717742	1	0.0277778
svm, poly synthetic samples	0.466667	0.545455	0.449438	0.693642	0.449438	0.509259
svm, poly upsampled	0.504	0.604255	0.531835	0.699507	0.531835	0.435185
grid, rbf kernel	0.717333	0.833856	0.996255	0.716981	0.996255	0.0277778
grid, rbf kernel synthetic samples	0.493333	0.586957	0.505618	0.699482	0.505618	0.462963
grid, rbf kernel upsampled	0.6	0.707031	0.677903	0.738776	0.677903	0.407407
grid, sigmoid kernel	0.714667	0.829346	0.973783	0.722222	0.973783	0.0740741
grid, sigmoid kernel synthetic samples	0.48	0.557823	0.460674	0.706897	0.460674	0.527778
grid, sigmoid kernel upsampled	0.496	0.588235	0.505618	0.703125	0.505618	0.472222
random forest estimator	0.712	0.829653	0.985019	0.716621	0.985019	0.037037
random forest estimator synthetic samples	0.653333	0.754717	0.749064	0.760456	0.749064	0.416667
random forest estimator, upsampled	0.682667	0.788632	0.831461	0.75	0.831461	0.314815
knn 10	0.728	0.834416	0.962547	0.73639	0.962547	0.148148
knn 10 synthetic samples	0.589333	0.681818	0.617978	0.760369	0.617978	0.518519
knn 10 upsampled	0.592	0.701754	0.674157	0.731707	0.674157	0.388889

TABLE CCL: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.552	0.555556	0.586592	0.527638	0.586592	0.520408
Logistic regression synthetic samples	0.544	0.541555	0.564246	0.520619	0.564246	0.52551
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.546667	0.538043	0.553073	0.52381	0.553073	0.540816
svm, linear kernel, synthetic samples	0.546667	0.530387	0.536313	0.52459	0.536313	0.556122
svm, linear kernel upsampled samples	0.517333	0.517333	0.541899	0.494898	0.541899	0.494898
svm, poly	0.538667	0.545932	0.581006	0.514851	0.581006	0.5
svm, poly synthetic samples	0.544	0.536585	0.553073	0.521053	0.553073	0.535714
svm, poly upsampled	0.522667	0.525199	0.553073	0.5	0.553073	0.494898
grid, rbf kernel	0.541333	0.544974	0.575419	0.517588	0.575419	0.510204
grid, rbf kernel synthetic samples	0.544	0.536585	0.553073	0.521053	0.553073	0.535714
grid, rbf kernel upsampled	0.522667	0.535065	0.575419	0.5	0.575419	0.47449
grid, sigmoid kernel	0.528	0.558603	0.625698	0.504505	0.625698	0.438776
grid, sigmoid kernel synthetic samples	0.522667	0.539846	0.586592	0.5	0.586592	0.464286
grid, sigmoid kernel upsampled	0.525333	0.521505	0.541899	0.502591	0.541899	0.510204
random forest estimator	0.592	0.592	0.620112	0.566327	0.620112	0.566327
random forest estimator synthetic samples	0.589333	0.588235	0.614525	0.564103	0.614525	0.566327
random forest estimator, upsampled	0.581333	0.616137	0.703911	0.547826	0.703911	0.469388
knn 10	0.56	0.550409	0.564246	0.537234	0.564246	0.556122
knn 10 synthetic samples	0.554667	0.539945	0.547486	0.532609	0.547486	0.561224
knn 10 upsampled	0.538667	0.533693	0.553073	0.515625	0.553073	0.52551

TABLE CCLI: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.765333	0	0	0	0	0.99308
Logistic regression synthetic samples	0.541333	0.358209	0.55814	0.263736	0.55814	0.536332
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.770667	0	0	0	0	1
svm, linear kernel, synthetic samples	0.498667	0.342657	0.569767	0.245	0.569767	0.477509
svm, linear kernel upsampled samples	0.496	0.363636	0.627907	0.255924	0.627907	0.456747
svm, poly	0.770667	0	0	0	0	1
svm, poly synthetic samples	0.461333	0.36478	0.674419	0.25	0.674419	0.397924
svm, poly upsampled	0.482667	0.357616	0.627907	0.25	0.627907	0.439446
grid, rbf kernel	0.770667	0	0	0	0	1
grid, rbf kernel synthetic samples	0.501333	0.374582	0.651163	0.262911	0.651163	0.456747
grid, rbf kernel upsampled	0.482667	0.37013	0.662791	0.256757	0.662791	0.429066
grid, sigmoid kernel	0.752	0.0412371	0.0232558	0.181818	0.0232558	0.968858
grid, sigmoid kernel synthetic samples	0.52	0.352518	0.569767	0.255208	0.569767	0.50519
grid, sigmoid kernel upsampled	0.544	0.391459	0.639535	0.282051	0.639535	0.515571
random forest estimator	0.773333	0.0229885	0.0116279	1	0.0116279	1
random forest estimator synthetic samples	0.672	0.320442	0.337209	0.305263	0.337209	0.771626
random forest estimator, upsampled	0.522667	0.37193	0.616279	0.266332	0.616279	0.49481
knn 10	0.786667	0.298246	0.197674	0.607143	0.197674	0.961938
knn 10 synthetic samples	0.536	0.387324	0.639535	0.277778	0.639535	0.50519
knn 10 upsampled	0.546667	0.360902	0.55814	0.266667	0.55814	0.543253

TABLE CCLII: Numerical results of ML methods, using data between time of birth - time of birth + 11 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.955026	0.976996	1	0.955026	1	0
Logistic regression synthetic samples	0.685185	0.810207	0.703601	0.954887	0.703601	0.294118
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.955026	0.976996	1	0.955026	1	0
svm, linear kernel, synthetic samples	0.65873	0.788871	0.66759	0.964	0.66759	0.470588
svm, linear kernel upsampled samples	0.661376	0.79085	0.67036	0.964143	0.67036	0.470588
svm, poly	0.955026	0.976996	1	0.955026	1	0
svm, poly synthetic samples	0.679894	0.805778	0.695291	0.958015	0.695291	0.352941
svm, poly upsampled	0.664021	0.793496	0.6759	0.96063	0.6759	0.411765
grid, rbf kernel	0.955026	0.976996	1	0.955026	1	0
grid, rbf kernel synthetic samples	0.809524	0.892857	0.831025	0.96463	0.831025	0.352941
grid, rbf kernel upsampled	0.854497	0.920405	0.880886	0.963636	0.880886	0.294118
grid, sigmoid kernel	0.952381	0.97561	0.99723	0.954907	0.99723	0
grid, sigmoid kernel synthetic samples	0.603175	0.746622	0.612188	0.95671	0.612188	0.411765
grid, sigmoid kernel upsampled	0.534392	0.683453	0.526316	0.974359	0.526316	0.705882
random forest estimator	0.955026	0.976996	1	0.955026	1	0
random forest estimator synthetic samples	0.939153	0.968276	0.972299	0.964286	0.972299	0.235294
random forest estimator, upsampled	0.962963	0.980978	1	0.962667	1	0.176471
knn 10	0.962963	0.980978	1	0.962667	1	0.176471
knn 10 synthetic samples	0.679894	0.80261	0.68144	0.97619	0.68144	0.647059
knn 10 upsampled	0.830688	0.905605	0.850416	0.968454	0.850416	0.411765

TABLE CCLIII: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.873016	0.932011	0.993958	0.877333	0.993958	0.0212766
Logistic regression synthetic samples	0.560847	0.692593	0.564955	0.894737	0.564955	0.531915
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.875661	0.933709	1	0.875661	1	0
svm, linear kernel, synthetic samples	0.518519	0.653992	0.519637	0.882051	0.519637	0.510638
svm, linear kernel upsampled samples	0.563492	0.697248	0.574018	0.88785	0.574018	0.489362
svm, poly	0.875661	0.933522	0.996979	0.87766	0.996979	0.0212766
svm, poly synthetic samples	0.574074	0.702403	0.574018	0.904762	0.574018	0.574468
svm, poly upsampled	0.611111	0.739823	0.63142	0.893162	0.63142	0.468085
grid, rbf kernel	0.875661	0.933522	0.996979	0.87766	0.996979	0.0212766
grid, rbf kernel synthetic samples	0.656085	0.778157	0.688822	0.894118	0.688822	0.425532
grid, rbf kernel upsampled	0.738095	0.841091	0.791541	0.89726	0.791541	0.361702
grid, sigmoid kernel	0.857143	0.922636	0.97281	0.877384	0.97281	0.0425532
grid, sigmoid kernel synthetic samples	0.507937	0.633858	0.486405	0.909605	0.486405	0.659574
grid, sigmoid kernel upsampled	0.473545	0.607495	0.465257	0.875	0.465257	0.531915
random forest estimator	0.875661	0.933709	1	0.875661	1	0
random forest estimator synthetic samples	0.825397	0.900302	0.900302	0.900302	0.900302	0.297872
random forest estimator, upsampled	0.888889	0.940171	0.996979	0.889488	0.996979	0.12766
knn 10	0.891534	0.941679	1	0.889785	1	0.12766
knn 10 synthetic samples	0.62963	0.746377	0.622356	0.932127	0.622356	0.680851
knn 10 upsampled	0.648148	0.764602	0.652568	0.923077	0.652568	0.617021

TABLE CCLIV: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.73545	0.84326	0.988971	0.734973	0.988971	0.0849057
Logistic regression synthetic samples	0.544974	0.635593	0.551471	0.75	0.551471	0.528302
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.719577	0.836923	1	0.719577	1	0
svm, linear kernel, synthetic samples	0.529101	0.613043	0.518382	0.75	0.518382	0.556604
svm, linear kernel upsampled samples	0.518519	0.612766	0.529412	0.727273	0.529412	0.490566
svm, poly	0.724868	0.839506	1	0.723404	1	0.0188679
svm, poly synthetic samples	0.537037	0.630021	0.547794	0.741294	0.547794	0.509434
svm, poly upsampled	0.526455	0.630928	0.5625	0.71831	0.5625	0.433962
grid, rbf kernel	0.724868	0.839009	0.996324	0.724599	0.996324	0.0283019
grid, rbf kernel synthetic samples	0.531746	0.632017	0.558824	0.727273	0.558824	0.462264
grid, rbf kernel upsampled	0.531746	0.635052	0.566176	0.723005	0.566176	0.443396
grid, sigmoid kernel	0.708995	0.823151	0.941176	0.731429	0.941176	0.113208
grid, sigmoid kernel synthetic samples	0.526455	0.613391	0.522059	0.743455	0.522059	0.537736
grid, sigmoid kernel upsampled	0.52381	0.613734	0.525735	0.737113	0.525735	0.518868
random forest estimator	0.730159	0.842105	1	0.727273	1	0.0377358
random forest estimator synthetic samples	0.648148	0.753247	0.746324	0.7603	0.746324	0.396226
random forest estimator, upsampled	0.685185	0.796581	0.856618	0.744409	0.856618	0.245283
knn 10	0.722222	0.830918	0.948529	0.739255	0.948529	0.141509
knn 10 synthetic samples	0.558201	0.645435	0.558824	0.763819	0.558824	0.556604
knn 10 upsampled	0.592593	0.694444	0.643382	0.75431	0.643382	0.462264

TABLE CCLV: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.558201	0.547425	0.537234	0.558011	0.537234	0.578947
Logistic regression synthetic samples	0.558201	0.559367	0.56383	0.554974	0.56383	0.552632
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.529101	0.482558	0.441489	0.532051	0.441489	0.615789
svm, linear kernel, synthetic samples	0.529101	0.534031	0.542553	0.525773	0.542553	0.515789
svm, linear kernel upsampled samples	0.566138	0.528736	0.489362	0.575	0.489362	0.642105
svm, poly	0.544974	0.530055	0.515957	0.544944	0.515957	0.573684
svm, poly synthetic samples	0.547619	0.560411	0.579787	0.542289	0.579787	0.515789
svm, poly upsampled	0.539683	0.556122	0.579787	0.534314	0.579787	0.5
grid, rbf kernel	0.584656	0.587927	0.595745	0.580311	0.595745	0.573684
grid, rbf kernel synthetic samples	0.571429	0.592965	0.62766	0.561905	0.62766	0.515789
grid, rbf kernel upsampled	0.568783	0.609113	0.675532	0.554585	0.675532	0.463158
grid, sigmoid kernel	0.507937	0.489011	0.473404	0.505682	0.473404	0.542105
grid, sigmoid kernel synthetic samples	0.558201	0.607059	0.68617	0.544304	0.68617	0.431579
grid, sigmoid kernel upsampled	0.550265	0.561856	0.579787	0.545	0.579787	0.521053
random forest estimator	0.571429	0.571429	0.574468	0.568421	0.574468	0.568421
random forest estimator synthetic samples	0.571429	0.578125	0.590426	0.566327	0.590426	0.552632
random forest estimator, upsampled	0.531746	0.598639	0.702128	0.521739	0.702128	0.363158
knn 10	0.579365	0.549575	0.515957	0.587879	0.515957	0.642105
knn 10 synthetic samples	0.579365	0.559557	0.537234	0.583815	0.537234	0.621053
knn 10 upsampled	0.555556	0.575758	0.606383	0.548077	0.606383	0.505263

TABLE CCLVI: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.759259	0.0421053	0.021978	0.5	0.021978	0.993031
Logistic regression synthetic samples	0.547619	0.39576	0.615385	0.291667	0.615385	0.526132
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.759259	0	0	0	0	1
svm, linear kernel, synthetic samples	0.478836	0.386293	0.681319	0.269565	0.681319	0.414634
svm, linear kernel upsampled samples	0.455026	0.35625	0.626374	0.248908	0.626374	0.400697
svm, poly	0.759259	0	0	0	0	1
svm, poly synthetic samples	0.484127	0.40367	0.725275	0.279661	0.725275	0.407666
svm, poly upsampled	0.410053	0.382271	0.758242	0.255556	0.758242	0.299652
grid, rbf kernel	0.759259	0	0	0	0	1
grid, rbf kernel synthetic samples	0.531746	0.337079	0.494505	0.255682	0.494505	0.543554
grid, rbf kernel upsampled	0.492063	0.342466	0.549451	0.248756	0.549451	0.473868
grid, sigmoid kernel	0.746032	0.111111	0.0659341	0.352941	0.0659341	0.961672
grid, sigmoid kernel synthetic samples	0.478836	0.390093	0.692308	0.271552	0.692308	0.41115
grid, sigmoid kernel upsampled	0.510582	0.408946	0.703297	0.288288	0.703297	0.449477
random forest estimator	0.76455	0.0430108	0.021978	1	0.021978	1
random forest estimator synthetic samples	0.685185	0.342541	0.340659	0.344444	0.340659	0.794425
random forest estimator, upsampled	0.510582	0.377104	0.615385	0.271845	0.615385	0.477352
knn 10	0.783069	0.305085	0.197802	0.666667	0.197802	0.968641
knn 10 synthetic samples	0.563492	0.4	0.604396	0.298913	0.604396	0.550523
knn 10 upsampled	0.592593	0.416667	0.604396	0.317919	0.604396	0.58885

TABLE CCLVII: Numerical results of ML methods, using data between time of birth - time of birth + 12 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.968668	0.984085	1	0.968668	1	0
Logistic regression synthetic samples	0.655352	0.789137	0.665768	0.968627	0.665768	0.333333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.968668	0.984085	1	0.968668	1	0
svm, linear kernel, synthetic samples	0.657963	0.791069	0.668464	0.96875	0.668464	0.333333
svm, linear kernel upsampled samples	0.678851	0.805071	0.684636	0.976923	0.684636	0.5
svm, poly	0.968668	0.984085	1	0.968668	1	0
svm, poly synthetic samples	0.657963	0.7904	0.665768	0.972441	0.665768	0.416667
svm, poly upsampled	0.689295	0.813187	0.698113	0.973684	0.698113	0.416667
grid, rbf kernel	0.968668	0.984085	1	0.968668	1	0
grid, rbf kernel synthetic samples	0.796345	0.885965	0.816712	0.968051	0.816712	0.166667
grid, rbf kernel upsampled	0.851175	0.919378	0.876011	0.967262	0.876011	0.0833333
grid, sigmoid kernel	0.960836	0.980027	0.991914	0.968421	0.991914	0
grid, sigmoid kernel synthetic samples	0.519582	0.679443	0.525606	0.960591	0.525606	0.333333
grid, sigmoid kernel upsampled	0.587467	0.734007	0.587601	0.977578	0.587601	0.583333
random forest estimator	0.968668	0.984085	1	0.968668	1	0
random forest estimator synthetic samples	0.929504	0.963365	0.956873	0.969945	0.956873	0.0833333
random forest estimator, upsampled	0.966057	0.98269	0.994609	0.971053	0.994609	0.0833333
knn 10	0.971279	0.985392	1	0.971204	1	0.0833333
knn 10 synthetic samples	0.70235	0.824615	0.722372	0.960573	0.722372	0.0833333
knn 10 upsampled	0.827676	0.905444	0.851752	0.966361	0.851752	0.0833333

TABLE CCLVIII: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.89295	0.943448	0.979943	0.909574	0.979943	0
Logistic regression synthetic samples	0.613577	0.752508	0.644699	0.903614	0.644699	0.294118
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.900783	0.947802	0.988539	0.91029	0.988539	0
svm, linear kernel, synthetic samples	0.556136	0.704861	0.581662	0.894273	0.581662	0.294118
svm, linear kernel upsampled samples	0.624021	0.761589	0.659026	0.901961	0.659026	0.264706
svm, poly	0.903394	0.949246	0.991404	0.910526	0.991404	0
svm, poly synthetic samples	0.582245	0.724138	0.601719	0.909091	0.601719	0.382353
svm, poly upsampled	0.642298	0.775777	0.679083	0.90458	0.679083	0.264706
grid, rbf kernel	0.911227	0.953552	1	0.911227	1	0
grid, rbf kernel synthetic samples	0.665796	0.79288	0.702006	0.910781	0.702006	0.294118
grid, rbf kernel upsampled	0.694517	0.815748	0.74212	0.905594	0.74212	0.205882
grid, sigmoid kernel	0.890339	0.941989	0.977077	0.909333	0.977077	0
grid, sigmoid kernel synthetic samples	0.516971	0.673721	0.547278	0.876147	0.547278	0.205882
grid, sigmoid kernel upsampled	0.477807	0.630996	0.489971	0.88601	0.489971	0.352941
random forest estimator	0.911227	0.953552	1	0.911227	1	0
random forest estimator synthetic samples	0.801567	0.888235	0.86533	0.912387	0.86533	0.147059
random forest estimator, upsampled	0.874674	0.932394	0.948424	0.916898	0.948424	0.117647
knn 10	0.913838	0.954608	0.994269	0.917989	0.994269	0.0882353
knn 10 synthetic samples	0.655352	0.780731	0.673352	0.928854	0.673352	0.470588
knn 10 upsampled	0.655352	0.782895	0.681948	0.918919	0.681948	0.382353

TABLE CCLIX: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.738903	0.848943	0.965636	0.757412	0.965636	0.0217391
Logistic regression synthetic samples	0.545692	0.65748	0.573883	0.769585	0.573883	0.456522
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.751958	0.85842	0.989691	0.757895	0.989691	0
svm, linear kernel, synthetic samples	0.535248	0.645418	0.556701	0.767773	0.556701	0.467391
svm, linear kernel upsampled samples	0.571802	0.691729	0.632302	0.763485	0.632302	0.380435
svm, poly	0.744125	0.853293	0.979381	0.755968	0.979381	0
svm, poly synthetic samples	0.556136	0.667969	0.587629	0.773756	0.587629	0.456522
svm, poly upsampled	0.616188	0.737968	0.71134	0.766667	0.71134	0.315217
grid, rbf kernel	0.751958	0.85842	0.989691	0.757895	0.989691	0
grid, rbf kernel synthetic samples	0.577023	0.69084	0.621993	0.776824	0.621993	0.434783
grid, rbf kernel upsampled	0.603133	0.727599	0.697595	0.7603	0.697595	0.304348
grid, sigmoid kernel	0.720627	0.837633	0.948454	0.75	0.948454	0
grid, sigmoid kernel synthetic samples	0.496084	0.605317	0.508591	0.747475	0.508591	0.456522
grid, sigmoid kernel upsampled	0.511749	0.617587	0.5189	0.762626	0.5189	0.48913
random forest estimator	0.749347	0.854103	0.965636	0.765668	0.965636	0.0652174
random forest estimator synthetic samples	0.665796	0.766423	0.721649	0.817121	0.721649	0.48913
random forest estimator, upsampled	0.663185	0.780985	0.790378	0.771812	0.790378	0.26087
knn 10	0.738903	0.845679	0.941581	0.767507	0.941581	0.0978261
knn 10 synthetic samples	0.535248	0.645418	0.556701	0.767773	0.556701	0.467391
knn 10 upsampled	0.597911	0.713755	0.659794	0.777328	0.659794	0.402174

TABLE CCLX: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.561358	0.569231	0.560606	0.578125	0.560606	0.562162
Logistic regression synthetic samples	0.569191	0.596577	0.616162	0.578199	0.616162	0.518919
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.545692	0.553846	0.545455	0.5625	0.545455	0.545946
svm, linear kernel, synthetic samples	0.545692	0.589623	0.631313	0.553097	0.631313	0.454054
svm, linear kernel upsampled samples	0.553525	0.597647	0.641414	0.559471	0.641414	0.459459
svm, poly	0.543081	0.559194	0.560606	0.557789	0.560606	0.524324
svm, poly synthetic samples	0.553525	0.619154	0.70202	0.553785	0.70202	0.394595
svm, poly upsampled	0.543081	0.597701	0.656566	0.548523	0.656566	0.421622
grid, rbf kernel	0.543081	0.543081	0.525253	0.562162	0.525253	0.562162
grid, rbf kernel synthetic samples	0.548303	0.583133	0.611111	0.557604	0.611111	0.481081
grid, rbf kernel upsampled	0.550914	0.609091	0.676768	0.553719	0.676768	0.416216
grid, sigmoid kernel	0.530026	0.543147	0.540404	0.545918	0.540404	0.518919
grid, sigmoid kernel synthetic samples	0.530026	0.565217	0.590909	0.541667	0.590909	0.464865
grid, sigmoid kernel upsampled	0.54047	0.586854	0.631313	0.548246	0.631313	0.443243
random forest estimator	0.600522	0.580822	0.535354	0.634731	0.535354	0.67027
random forest estimator synthetic samples	0.577023	0.573684	0.550505	0.598901	0.550505	0.605405
random forest estimator, upsampled	0.558747	0.620225	0.69697	0.558704	0.69697	0.410811
knn 10	0.550914	0.537634	0.505051	0.574713	0.505051	0.6
knn 10 synthetic samples	0.556136	0.561856	0.550505	0.573684	0.550505	0.562162
knn 10 upsampled	0.527415	0.541772	0.540404	0.543147	0.540404	0.513514

TABLE CCLXI: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.738903	0.0740741	0.04	0.5	0.04	0.985866
Logistic regression synthetic samples	0.522193	0.32967	0.45	0.260116	0.45	0.547703
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.741514	0.019802	0.01	1	0.01	1
svm, linear kernel, synthetic samples	0.496084	0.345763	0.51	0.261538	0.51	0.491166
svm, linear kernel upsampled samples	0.563969	0.312757	0.38	0.265734	0.38	0.628975
svm, poly	0.741514	0.019802	0.01	1	0.01	1
svm, poly synthetic samples	0.48564	0.370607	0.58	0.2723	0.58	0.452297
svm, poly upsampled	0.550914	0.306452	0.38	0.256757	0.38	0.611307
grid, rbf kernel	0.741514	0.019802	0.01	1	0.01	1
grid, rbf kernel synthetic samples	0.516971	0.364261	0.53	0.277487	0.53	0.512367
grid, rbf kernel upsampled	0.616188	0.379747	0.45	0.328467	0.45	0.674912
grid, sigmoid kernel	0.723238	0.0363636	0.02	0.2	0.02	0.971731
grid, sigmoid kernel synthetic samples	0.475196	0.318644	0.47	0.241026	0.47	0.477032
grid, sigmoid kernel upsampled	0.563969	0.318367	0.39	0.268966	0.39	0.625442
random forest estimator	0.744125	0.0392157	0.02	1	0.02	1
random forest estimator synthetic samples	0.642298	0.297436	0.29	0.305263	0.29	0.766784
random forest estimator, upsampled	0.48564	0.349835	0.53	0.261084	0.53	0.469965
knn 10	0.746736	0.198347	0.12	0.571429	0.12	0.968198
knn 10 synthetic samples	0.553525	0.404181	0.58	0.31016	0.58	0.54417
knn 10 upsampled	0.524804	0.320896	0.43	0.255952	0.43	0.558304

TABLE CCLXII: Numerical results of ML methods, using data between time of birth - time of birth + 13 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.955844	0.977424	0.994595	0.960836	0.994595	0
Logistic regression synthetic samples	0.719481	0.834862	0.737838	0.961268	0.737838	0.266667
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.961039	0.980132	1	0.961039	1	0
svm, linear kernel, synthetic samples	0.67013	0.8	0.686486	0.958491	0.686486	0.266667
svm, linear kernel upsampled samples	0.664935	0.79685	0.683784	0.954717	0.683784	0.2
svm, poly	0.961039	0.980132	1	0.961039	1	0
svm, poly synthetic samples	0.649351	0.784689	0.664865	0.957198	0.664865	0.266667
svm, poly upsampled	0.667532	0.798107	0.683784	0.958333	0.683784	0.266667
grid, rbf kernel	0.961039	0.980132	1	0.961039	1	0
grid, rbf kernel synthetic samples	0.807792	0.893064	0.835135	0.959627	0.835135	0.133333
grid, rbf kernel upsampled	0.849351	0.918079	0.878378	0.961538	0.878378	0.133333
grid, sigmoid kernel	0.961039	0.980132	1	0.961039	1	0
grid, sigmoid kernel synthetic samples	0.571429	0.722689	0.581081	0.955556	0.581081	0.333333
grid, sigmoid kernel upsampled	0.501299	0.655914	0.494595	0.973404	0.494595	0.666667
random forest estimator	0.961039	0.980132	1	0.961039	1	0
random forest estimator synthetic samples	0.945455	0.971812	0.978378	0.965333	0.978378	0.133333
random forest estimator, upsampled	0.963636	0.981383	0.997297	0.965969	0.997297	0.133333
knn 10	0.966234	0.982736	1	0.966057	1	0.133333
knn 10 synthetic samples	0.714286	0.830769	0.72973	0.964286	0.72973	0.333333
knn 10 upsampled	0.838961	0.911429	0.862162	0.966667	0.862162	0.266667

TABLE CCLXIII: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.880519	0.936464	0.991228	0.887435	0.991228	0
Logistic regression synthetic samples	0.568831	0.711806	0.599415	0.876068	0.599415	0.325581
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.888312	0.940853	1	0.888312	1	0
svm, linear kernel, synthetic samples	0.542857	0.689046	0.570175	0.870536	0.570175	0.325581
svm, linear kernel upsampled samples	0.553247	0.699301	0.584795	0.869565	0.584795	0.302326
svm, poly	0.883117	0.937931	0.994152	0.887728	0.994152	0
svm, poly synthetic samples	0.581818	0.720971	0.608187	0.885106	0.608187	0.372093
svm, poly upsampled	0.568831	0.713793	0.605263	0.869748	0.605263	0.27907
grid, rbf kernel	0.888312	0.940853	1	0.888312	1	0
grid, rbf kernel synthetic samples	0.587013	0.726334	0.616959	0.882845	0.616959	0.348837
grid, rbf kernel upsampled	0.675325	0.796085	0.71345	0.900369	0.71345	0.372093
grid, sigmoid kernel	0.87013	0.930556	0.979532	0.886243	0.979532	0
grid, sigmoid kernel synthetic samples	0.480519	0.62406	0.48538	0.873684	0.48538	0.44186
grid, sigmoid kernel upsampled	0.488312	0.631776	0.494152	0.875648	0.494152	0.44186
random forest estimator	0.888312	0.940853	1	0.888312	1	0
random forest estimator synthetic samples	0.825974	0.903597	0.918129	0.889518	0.918129	0.0930233
random forest estimator, upsampled	0.872727	0.931276	0.97076	0.894879	0.97076	0.0930233
knn 10	0.896104	0.944598	0.997076	0.897368	0.997076	0.0930233
knn 10 synthetic samples	0.587013	0.723478	0.608187	0.892704	0.608187	0.418605
knn 10 upsampled	0.579221	0.715789	0.596491	0.894737	0.596491	0.44186

TABLE CCLXIV: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.724675	0.839394	0.97193	0.738667	0.97193	0.02
Logistic regression synthetic samples	0.54026	0.642424	0.557895	0.757143	0.557895	0.49
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.742857	0.852018	1	0.742188	1	0.01
svm, linear kernel, synthetic samples	0.550649	0.649087	0.561404	0.769231	0.561404	0.52
svm, linear kernel upsampled samples	0.579221	0.688462	0.62807	0.761702	0.62807	0.44
svm, poly	0.74026	0.850299	0.996491	0.741514	0.996491	0.01
svm, poly synthetic samples	0.524675	0.613108	0.508772	0.771277	0.508772	0.57
svm, poly upsampled	0.579221	0.687259	0.624561	0.763948	0.624561	0.45
grid, rbf kernel	0.74026	0.850299	0.996491	0.741514	0.996491	0.01
grid, rbf kernel synthetic samples	0.535065	0.621564	0.515789	0.781915	0.515789	0.59
grid, rbf kernel upsampled	0.625974	0.729323	0.680702	0.785425	0.680702	0.47
grid, sigmoid kernel	0.701299	0.823349	0.940351	0.73224	0.940351	0.02
grid, sigmoid kernel synthetic samples	0.516883	0.626506	0.547368	0.732394	0.547368	0.43
grid, sigmoid kernel upsampled	0.52987	0.635815	0.554386	0.745283	0.554386	0.46
random forest estimator	0.748052	0.853695	0.992982	0.748677	0.992982	0.05
random forest estimator synthetic samples	0.677922	0.775362	0.750877	0.801498	0.750877	0.47
random forest estimator, upsampled	0.711688	0.813445	0.849123	0.780645	0.849123	0.32
knn 10	0.737662	0.840945	0.936842	0.762857	0.936842	0.17
knn 10 synthetic samples	0.553247	0.650407	0.561404	0.772947	0.561404	0.53
knn 10 upsampled	0.612987	0.711799	0.645614	0.793103	0.645614	0.52

TABLE CCLXV: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.524675	0.545906	0.575916	0.518868	0.575916	0.474227
Logistic regression synthetic samples	0.524675	0.552567	0.591623	0.518349	0.591623	0.458763
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.527273	0.540404	0.560209	0.521951	0.560209	0.494845
svm, linear kernel, synthetic samples	0.522078	0.557692	0.60733	0.515556	0.60733	0.438144
svm, linear kernel upsampled samples	0.537662	0.545918	0.560209	0.532338	0.560209	0.515464
svm, poly	0.52987	0.559611	0.602094	0.522727	0.602094	0.458763
svm, poly synthetic samples	0.537662	0.584112	0.65445	0.527426	0.65445	0.42268
svm, poly upsampled	0.553247	0.580488	0.623037	0.543379	0.623037	0.484536
grid, rbf kernel	0.568831	0.587065	0.617801	0.559242	0.617801	0.520619
grid, rbf kernel synthetic samples	0.568831	0.599034	0.649215	0.556054	0.649215	0.489691
grid, rbf kernel upsampled	0.542857	0.56	0.586387	0.535885	0.586387	0.5
grid, sigmoid kernel	0.516883	0.561321	0.623037	0.51073	0.623037	0.412371
grid, sigmoid kernel synthetic samples	0.537662	0.58216	0.649215	0.52766	0.649215	0.427835
grid, sigmoid kernel upsampled	0.548052	0.591549	0.659686	0.53617	0.659686	0.438144
random forest estimator	0.587013	0.599496	0.623037	0.57767	0.623037	0.551546
random forest estimator synthetic samples	0.566234	0.579345	0.602094	0.558252	0.602094	0.530928
random forest estimator, upsampled	0.548052	0.613333	0.722513	0.532819	0.722513	0.376289
knn 10	0.574026	0.57513	0.581152	0.569231	0.581152	0.56701
knn 10 synthetic samples	0.571429	0.582278	0.602094	0.563725	0.602094	0.541237
knn 10 upsampled	0.568831	0.569948	0.575916	0.564103	0.575916	0.561856

TABLE CCLXVI: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.716883	0	0	0	0	1
Logistic regression synthetic samples	0.532468	0.352518	0.449541	0.289941	0.449541	0.565217
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.716883	0	0	0	0	1
svm, linear kernel, synthetic samples	0.493506	0.392523	0.577982	0.29717	0.577982	0.460145
svm, linear kernel upsampled samples	0.566234	0.369811	0.449541	0.314103	0.449541	0.612319
svm, poly	0.714286	0	0	0	0	0.996377
svm, poly synthetic samples	0.477922	0.365931	0.53211	0.278846	0.53211	0.456522
svm, poly upsampled	0.576623	0.340081	0.385321	0.304348	0.385321	0.652174
grid, rbf kernel	0.716883	0	0	0	0	1
grid, rbf kernel synthetic samples	0.522078	0.356643	0.46789	0.288136	0.46789	0.543478
grid, rbf kernel upsampled	0.584416	0.338843	0.376147	0.308271	0.376147	0.666667
grid, sigmoid kernel	0.714286	0.0677966	0.0366972	0.444444	0.0366972	0.981884
grid, sigmoid kernel synthetic samples	0.52987	0.386441	0.522936	0.306452	0.522936	0.532609
grid, sigmoid kernel upsampled	0.571429	0.382022	0.46789	0.322785	0.46789	0.612319
random forest estimator	0.719481	0.0181818	0.00917431	1	0.00917431	1
random forest estimator synthetic samples	0.672727	0.292135	0.238532	0.376812	0.238532	0.844203
random forest estimator, upsampled	0.498701	0.367213	0.513761	0.285714	0.513761	0.492754
knn 10	0.732468	0.176	0.100917	0.6875	0.100917	0.981884
knn 10 synthetic samples	0.527273	0.359155	0.46789	0.291429	0.46789	0.550725
knn 10 upsampled	0.550649	0.337165	0.40367	0.289474	0.40367	0.608696

TABLE CCLXVII: Numerical results of ML methods, using data between time of birth - time of birth + 14 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.96124	0.980237	0.992	0.96875	0.992	0
Logistic regression synthetic samples	0.653747	0.789969	0.672	0.958175	0.672	0.0833333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.968992	0.984252	1	0.968992	1	0
svm, linear kernel, synthetic samples	0.612403	0.758065	0.626667	0.959184	0.626667	0.166667
svm, linear kernel upsampled samples	0.630491	0.77193	0.645333	0.960317	0.645333	0.166667
svm, poly	0.968992	0.984252	1	0.968992	1	0
svm, poly synthetic samples	0.651163	0.788069	0.669333	0.958015	0.669333	0.0833333
svm, poly upsampled	0.633075	0.774603	0.650667	0.956863	0.650667	0.0833333
grid, rbf kernel	0.968992	0.984252	1	0.968992	1	0
grid, rbf kernel synthetic samples	0.808786	0.893983	0.832	0.965944	0.832	0.0833333
grid, rbf kernel upsampled	0.852713	0.92028	0.877333	0.967647	0.877333	0.0833333
grid, sigmoid kernel	0.958656	0.978892	0.989333	0.968668	0.989333	0
grid, sigmoid kernel synthetic samples	0.5323	0.690598	0.538667	0.961905	0.538667	0.333333
grid, sigmoid kernel upsampled	0.498708	0.660839	0.504	0.959391	0.504	0.333333
random forest estimator	0.968992	0.984252	1	0.968992	1	0
random forest estimator synthetic samples	0.940568	0.969374	0.970667	0.968085	0.970667	0
random forest estimator, upsampled	0.963824	0.981579	0.994667	0.968831	0.994667	0
knn 10	0.968992	0.984252	1	0.968992	1	0
knn 10 synthetic samples	0.715762	0.832317	0.728	0.97153	0.728	0.333333
knn 10 upsampled	0.829457	0.90678	0.856	0.963964	0.856	0

TABLE CCLXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.873385	0.932227	0.98538	0.884514	0.98538	0.0222222
Logistic regression synthetic samples	0.609819	0.745363	0.646199	0.880478	0.646199	0.333333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.883721	0.938272	1	0.883721	1	0
svm, linear kernel, synthetic samples	0.568475	0.707531	0.590643	0.882096	0.590643	0.4
svm, linear kernel upsampled samples	0.674419	0.798077	0.72807	0.882979	0.72807	0.266667
svm, poly	0.881137	0.936639	0.994152	0.885417	0.994152	0.0222222
svm, poly synthetic samples	0.622739	0.752542	0.649123	0.895161	0.649123	0.422222
svm, poly upsampled	0.697674	0.815748	0.75731	0.883959	0.75731	0.244444
grid, rbf kernel	0.886305	0.93956	1	0.88601	1	0.0222222
grid, rbf kernel synthetic samples	0.682171	0.8	0.719298	0.901099	0.719298	0.4
grid, rbf kernel upsampled	0.692506	0.810207	0.74269	0.891228	0.74269	0.311111
grid, sigmoid kernel	0.873385	0.932414	0.988304	0.882507	0.988304	0
grid, sigmoid kernel synthetic samples	0.509044	0.653285	0.523392	0.868932	0.523392	0.4
grid, sigmoid kernel upsampled	0.527132	0.667877	0.538012	0.880383	0.538012	0.444444
random forest estimator	0.883721	0.938272	1	0.883721	1	0
random forest estimator synthetic samples	0.839793	0.911429	0.932749	0.891061	0.932749	0.133333
random forest estimator, upsampled	0.870801	0.930556	0.979532	0.886243	0.979532	0.0444444
knn 10	0.888889	0.940853	1	0.888312	1	0.0444444
knn 10 synthetic samples	0.627907	0.751724	0.637427	0.915966	0.637427	0.555556
knn 10 upsampled	0.658915	0.777778	0.675439	0.916667	0.675439	0.533333

TABLE CCLXIX: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.700258	0.822086	0.98893	0.703412	0.98893	0.0258621
Logistic regression synthetic samples	0.529716	0.609442	0.523985	0.728205	0.523985	0.543103
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.700258	0.823708	1	0.700258	1	0
svm, linear kernel, synthetic samples	0.50646	0.57461	0.476015	0.724719	0.476015	0.577586
svm, linear kernel upsampled samples	0.591731	0.684	0.630996	0.746725	0.630996	0.5
svm, poly	0.705426	0.82622	1	0.703896	1	0.0172414
svm, poly synthetic samples	0.5323	0.59867	0.498155	0.75	0.498155	0.612069
svm, poly upsampled	0.625323	0.738739	0.756458	0.721831	0.756458	0.318966
grid, rbf kernel	0.702842	0.824962	1	0.702073	1	0.00862069
grid, rbf kernel synthetic samples	0.542636	0.614379	0.520295	0.75	0.520295	0.594828
grid, rbf kernel upsampled	0.630491	0.723404	0.690037	0.760163	0.690037	0.491379
grid, sigmoid kernel	0.689922	0.814815	0.97417	0.700265	0.97417	0.0258621
grid, sigmoid kernel synthetic samples	0.514212	0.587719	0.494465	0.724324	0.494465	0.560345
grid, sigmoid kernel upsampled	0.514212	0.593074	0.505535	0.717277	0.505535	0.534483
random forest estimator	0.705426	0.82622	1	0.703896	1	0.0172414
random forest estimator synthetic samples	0.666667	0.768402	0.789668	0.748252	0.789668	0.37931
random forest estimator, upsampled	0.697674	0.805324	0.892989	0.733333	0.892989	0.241379
knn 10	0.70801	0.820919	0.95572	0.719444	0.95572	0.12931
knn 10 synthetic samples	0.540052	0.629167	0.557196	0.722488	0.557196	0.5
knn 10 upsampled	0.594315	0.690335	0.645756	0.741525	0.645756	0.474138

TABLE CCLXX: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.547804	0.550129	0.60452	0.504717	0.60452	0.5
Logistic regression synthetic samples	0.555556	0.532609	0.553672	0.513089	0.553672	0.557143
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.576227	0.57513	0.627119	0.5311	0.627119	0.533333
svm, linear kernel, synthetic samples	0.573643	0.537815	0.542373	0.533333	0.542373	0.6
svm, linear kernel upsampled samples	0.516796	0.503979	0.536723	0.475	0.536723	0.5
svm, poly	0.537468	0.578824	0.694915	0.495968	0.694915	0.404762
svm, poly synthetic samples	0.563307	0.558747	0.60452	0.519417	0.60452	0.528571
svm, poly upsampled	0.542636	0.547315	0.60452	0.5	0.60452	0.490476
grid, rbf kernel	0.589147	0.622328	0.740113	0.536885	0.740113	0.461905
grid, rbf kernel synthetic samples	0.596899	0.589474	0.632768	0.551724	0.632768	0.566667
grid, rbf kernel upsampled	0.516796	0.549398	0.644068	0.478992	0.644068	0.409524
grid, sigmoid kernel	0.514212	0.548077	0.644068	0.476987	0.644068	0.404762
grid, sigmoid kernel synthetic samples	0.51938	0.535	0.60452	0.479821	0.60452	0.447619
grid, sigmoid kernel upsampled	0.498708	0.510101	0.570621	0.461187	0.570621	0.438095
random forest estimator	0.576227	0.58794	0.661017	0.529412	0.661017	0.504762
random forest estimator synthetic samples	0.591731	0.592784	0.649718	0.545024	0.649718	0.542857
random forest estimator, upsampled	0.596899	0.638889	0.779661	0.541176	0.779661	0.442857
knn 10	0.550388	0.546875	0.59322	0.507246	0.59322	0.514286
knn 10 synthetic samples	0.552972	0.538667	0.570621	0.510101	0.570621	0.538095
knn 10 upsampled	0.540052	0.536458	0.581921	0.497585	0.581921	0.504762

TABLE CCLXXI: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.770026	0.021978	0.0117647	0.166667	0.0117647	0.983444
Logistic regression synthetic samples	0.540052	0.364286	0.6	0.261538	0.6	0.523179
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.780362	0	0	0	0	1
svm, linear kernel, synthetic samples	0.529716	0.359155	0.6	0.256281	0.6	0.509934
svm, linear kernel upsampled samples	0.488372	0.331081	0.576471	0.232227	0.576471	0.463576
svm, poly	0.777778	0	0	0	0	0.996689
svm, poly synthetic samples	0.516796	0.339223	0.564706	0.242424	0.564706	0.503311
svm, poly upsampled	0.470284	0.327869	0.588235	0.227273	0.588235	0.437086
grid, rbf kernel	0.780362	0	0	0	0	1
grid, rbf kernel synthetic samples	0.54522	0.338346	0.529412	0.248619	0.529412	0.549669
grid, rbf kernel upsampled	0.514212	0.381579	0.682353	0.26484	0.682353	0.466887
grid, sigmoid kernel	0.762274	0.0416667	0.0235294	0.181818	0.0235294	0.970199
grid, sigmoid kernel synthetic samples	0.5323	0.369338	0.623529	0.262376	0.623529	0.506623
grid, sigmoid kernel upsampled	0.421189	0.3	0.564706	0.204255	0.564706	0.380795
random forest estimator	0.788114	0.0681818	0.0352941	1	0.0352941	1
random forest estimator synthetic samples	0.682171	0.272189	0.270588	0.27381	0.270588	0.798013
random forest estimator, upsampled	0.521964	0.350877	0.588235	0.25	0.588235	0.503311
knn 10	0.801034	0.237624	0.141176	0.75	0.141176	0.986755
knn 10 synthetic samples	0.490956	0.262172	0.411765	0.192308	0.411765	0.513245
knn 10 upsampled	0.534884	0.291339	0.435294	0.218935	0.435294	0.562914

TABLE CCLXXII: Numerical results of ML methods, using data between time of birth - time of birth + 15 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.956298	0.977661	0.997319	0.958763	0.997319	0
Logistic regression synthetic samples	0.732648	0.844776	0.758713	0.952862	0.758713	0.125
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.958869	0.979003	1	0.958869	1	0
svm, linear kernel, synthetic samples	0.694087	0.818321	0.718499	0.950355	0.718499	0.125
svm, linear kernel upsampled samples	0.714653	0.832073	0.737265	0.954861	0.737265	0.1875
svm, poly	0.958869	0.979003	1	0.958869	1	0
svm, poly synthetic samples	0.691517	0.815951	0.713137	0.953405	0.713137	0.1875
svm, poly upsampled	0.712082	0.830303	0.734584	0.954704	0.734584	0.1875
grid, rbf kernel	0.958869	0.979003	1	0.958869	1	0
grid, rbf kernel synthetic samples	0.820051	0.90113	0.855228	0.952239	0.855228	0
grid, rbf kernel upsampled	0.912596	0.954301	0.951743	0.956873	0.951743	0
grid, sigmoid kernel	0.958869	0.979003	1	0.958869	1	0
grid, sigmoid kernel synthetic samples	0.573265	0.725166	0.587131	0.948052	0.587131	0.25
grid, sigmoid kernel upsampled	0.562982	0.715719	0.573727	0.951111	0.573727	0.3125
random forest estimator	0.958869	0.979003	1	0.958869	1	0
random forest estimator synthetic samples	0.943445	0.970822	0.981233	0.96063	0.981233	0.0625
random forest estimator, upsampled	0.958869	0.979003	1	0.958869	1	0
knn 10	0.958869	0.979003	1	0.958869	1	0
knn 10 synthetic samples	0.724936	0.837139	0.737265	0.96831	0.737265	0.4375
knn 10 upsampled	0.830334	0.907042	0.863271	0.95549	0.863271	0.0625

TABLE CCLXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.894602	0.944218	0.991429	0.901299	0.991429	0.025641
Logistic regression synthetic samples	0.596401	0.731624	0.611429	0.910638	0.611429	0.461538
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.899743	0.947226	1	0.899743	1	0
svm, linear kernel, synthetic samples	0.544987	0.682226	0.542857	0.917874	0.542857	0.564103
svm, linear kernel upsampled samples	0.647815	0.772803	0.665714	0.920949	0.665714	0.487179
svm, poly	0.902314	0.94837	0.997143	0.904145	0.997143	0.0512821
svm, poly synthetic samples	0.547558	0.685714	0.548571	0.914286	0.548571	0.538462
svm, poly upsampled	0.634961	0.762542	0.651429	0.919355	0.651429	0.487179
grid, rbf kernel	0.902314	0.948509	1	0.902062	1	0.025641
grid, rbf kernel synthetic samples	0.583548	0.723549	0.605714	0.898305	0.605714	0.384615
grid, rbf kernel upsampled	0.673522	0.798092	0.717143	0.899642	0.717143	0.282051
grid, sigmoid kernel	0.884319	0.938272	0.977143	0.902375	0.977143	0.0512821
grid, sigmoid kernel synthetic samples	0.48072	0.621723	0.474286	0.902174	0.474286	0.538462
grid, sigmoid kernel upsampled	0.529563	0.667877	0.525714	0.915423	0.525714	0.564103
random forest estimator	0.899743	0.947226	1	0.899743	1	0
random forest estimator synthetic samples	0.845758	0.91453	0.917143	0.911932	0.917143	0.205128
random forest estimator, upsampled	0.894602	0.944065	0.988571	0.903394	0.988571	0.0512821
knn 10	0.904884	0.949796	1	0.904393	1	0.0512821
knn 10 synthetic samples	0.601542	0.732297	0.605714	0.925764	0.605714	0.564103
knn 10 upsampled	0.640103	0.765101	0.651429	0.926829	0.651429	0.538462

TABLE CCLXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.727506	0.839879	0.972028	0.739362	0.972028	0.0485437
Logistic regression synthetic samples	0.526992	0.62449	0.534965	0.75	0.534965	0.504854
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.737789	0.848665	1	0.737113	1	0.00970874
svm, linear kernel, synthetic samples	0.514139	0.597015	0.48951	0.765027	0.48951	0.582524
svm, linear kernel upsampled samples	0.547558	0.654902	0.583916	0.745536	0.583916	0.446602
svm, poly	0.742931	0.850746	0.996503	0.742188	0.996503	0.038835
svm, poly synthetic samples	0.493573	0.574514	0.465035	0.751412	0.465035	0.572816
svm, poly upsampled	0.537275	0.645669	0.573427	0.738739	0.573427	0.436893
grid, rbf kernel	0.745501	0.852459	1	0.742857	1	0.038835
grid, rbf kernel synthetic samples	0.508997	0.589247	0.479021	0.765363	0.479021	0.592233
grid, rbf kernel upsampled	0.583548	0.69084	0.632867	0.760504	0.632867	0.446602
grid, sigmoid kernel	0.724936	0.84006	0.982517	0.733681	0.982517	0.00970874
grid, sigmoid kernel synthetic samples	0.467866	0.538976	0.423077	0.742331	0.423077	0.592233
grid, sigmoid kernel upsampled	0.514139	0.622754	0.545455	0.725581	0.545455	0.427184
random forest estimator	0.737789	0.847761	0.993007	0.739583	0.993007	0.0291262
random forest estimator synthetic samples	0.647815	0.754919	0.737762	0.772894	0.737762	0.398058
random forest estimator, upsampled	0.709512	0.81445	0.867133	0.767802	0.867133	0.271845
knn 10	0.735219	0.838811	0.937063	0.759207	0.937063	0.174757
knn 10 synthetic samples	0.550129	0.642127	0.548951	0.773399	0.548951	0.553398
knn 10 upsampled	0.627249	0.730983	0.688811	0.778656	0.688811	0.456311

TABLE CCLXXV: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.578406	0.556757	0.530928	0.585227	0.530928	0.625641
Logistic regression synthetic samples	0.565553	0.55643	0.546392	0.566845	0.546392	0.584615
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.606684	0.556522	0.494845	0.635762	0.494845	0.717949
svm, linear kernel, synthetic samples	0.583548	0.571429	0.556701	0.586957	0.556701	0.610256
svm, linear kernel upsampled samples	0.586118	0.583979	0.582474	0.585492	0.582474	0.589744
svm, poly	0.601542	0.56338	0.515464	0.621118	0.515464	0.687179
svm, poly synthetic samples	0.586118	0.604423	0.634021	0.577465	0.634021	0.538462
svm, poly upsampled	0.59126	0.59335	0.597938	0.588832	0.597938	0.584615
grid, rbf kernel	0.562982	0.554974	0.546392	0.56383	0.546392	0.579487
grid, rbf kernel synthetic samples	0.573265	0.606635	0.659794	0.561404	0.659794	0.487179
grid, rbf kernel upsampled	0.59126	0.627635	0.690722	0.575107	0.690722	0.492308
grid, sigmoid kernel	0.578406	0.551913	0.520619	0.587209	0.520619	0.635897
grid, sigmoid kernel synthetic samples	0.562982	0.554974	0.546392	0.56383	0.546392	0.579487
grid, sigmoid kernel upsampled	0.537275	0.502762	0.469072	0.541667	0.469072	0.605128
random forest estimator	0.59126	0.571429	0.546392	0.59887	0.546392	0.635897
random forest estimator synthetic samples	0.596401	0.590078	0.582474	0.597884	0.582474	0.610256
random forest estimator, upsampled	0.562982	0.622222	0.721649	0.546875	0.721649	0.405128
knn 10	0.568123	0.58209	0.603093	0.5625	0.603093	0.533333
knn 10 synthetic samples	0.570694	0.589681	0.618557	0.56338	0.618557	0.523077
knn 10 upsampled	0.552699	0.597222	0.664948	0.542017	0.664948	0.441026

TABLE CCLXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.732648	0.0545455	0.0285714	0.6	0.0285714	0.992958
Logistic regression synthetic samples	0.51928	0.382838	0.552381	0.292929	0.552381	0.507042
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.730077	0	0	0	0	1
svm, linear kernel, synthetic samples	0.485861	0.371069	0.561905	0.276995	0.561905	0.457746
svm, linear kernel upsampled samples	0.521851	0.392157	0.571429	0.298507	0.571429	0.503521
svm, poly	0.724936	0	0	0	0	0.992958
svm, poly synthetic samples	0.475578	0.358491	0.542857	0.267606	0.542857	0.450704
svm, poly upsampled	0.511568	0.375	0.542857	0.286432	0.542857	0.5
grid, rbf kernel	0.730077	0	0	0	0	1
grid, rbf kernel synthetic samples	0.508997	0.37785	0.552381	0.287129	0.552381	0.492958
grid, rbf kernel upsampled	0.534704	0.398671	0.571429	0.306122	0.571429	0.521127
grid, sigmoid kernel	0.712082	0.0819672	0.047619	0.294118	0.047619	0.957746
grid, sigmoid kernel synthetic samples	0.51928	0.410095	0.619048	0.306604	0.619048	0.482394
grid, sigmoid kernel upsampled	0.524422	0.372881	0.52381	0.289474	0.52381	0.524648
random forest estimator	0.735219	0.0373832	0.0190476	1	0.0190476	1
random forest estimator synthetic samples	0.632391	0.288557	0.27619	0.302083	0.27619	0.764085
random forest estimator, upsampled	0.532134	0.401316	0.580952	0.306533	0.580952	0.514085
knn 10	0.768638	0.262295	0.152381	0.941176	0.152381	0.996479
knn 10 synthetic samples	0.503856	0.387302	0.580952	0.290476	0.580952	0.475352
knn 10 upsampled	0.586118	0.414545	0.542857	0.335294	0.542857	0.602113

TABLE CCLXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 16 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.964103	0.981723	0.997347	0.966581	0.997347	0
Logistic regression synthetic samples	0.630769	0.771429	0.644562	0.960474	0.644562	0.230769
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.966667	0.983051	1	0.966667	1	0
svm, linear kernel, synthetic samples	0.566667	0.717863	0.570292	0.968468	0.570292	0.461538
svm, linear kernel upsampled samples	0.551282	0.702886	0.549072	0.976415	0.549072	0.615385
svm, poly	0.966667	0.983051	1	0.966667	1	0
svm, poly synthetic samples	0.610256	0.75641	0.625995	0.955466	0.625995	0.153846
svm, poly upsampled	0.635897	0.775316	0.649867	0.960784	0.649867	0.230769
grid, rbf kernel	0.966667	0.983051	1	0.966667	1	0
grid, rbf kernel synthetic samples	0.797436	0.886657	0.819629	0.965625	0.819629	0.153846
grid, rbf kernel upsampled	0.887179	0.939891	0.912467	0.969014	0.912467	0.153846
grid, sigmoid kernel	0.964103	0.981675	0.994695	0.968992	0.994695	0.0769231
grid, sigmoid kernel synthetic samples	0.566667	0.715008	0.562334	0.981481	0.562334	0.692308
grid, sigmoid kernel upsampled	0.579487	0.727575	0.580902	0.973333	0.580902	0.538462
random forest estimator	0.966667	0.983051	1	0.966667	1	0
random forest estimator synthetic samples	0.946154	0.972185	0.973475	0.970899	0.973475	0.153846
random forest estimator, upsampled	0.966667	0.983007	0.997347	0.969072	0.997347	0.0769231
knn 10	0.969231	0.984334	1	0.969152	1	0.0769231
knn 10 synthetic samples	0.679487	0.807396	0.69496	0.963235	0.69496	0.230769
knn 10 upsampled	0.820513	0.90085	0.843501	0.966565	0.843501	0.153846

TABLE CCLXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.897436	0.945799	0.988669	0.906494	0.988669	0.027027
Logistic regression synthetic samples	0.597436	0.737896	0.626062	0.898374	0.626062	0.324324
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.905128	0.950202	1	0.905128	1	0
svm, linear kernel, synthetic samples	0.55641	0.700173	0.572238	0.901786	0.572238	0.405405
svm, linear kernel upsampled samples	0.579487	0.721088	0.600567	0.902128	0.600567	0.378378
svm, poly	0.905128	0.950067	0.997167	0.907216	0.997167	0.027027
svm, poly synthetic samples	0.574359	0.714777	0.589235	0.908297	0.589235	0.432432
svm, poly upsampled	0.602564	0.742097	0.631728	0.899194	0.631728	0.324324
grid, rbf kernel	0.905128	0.950202	1	0.905128	1	0
grid, rbf kernel synthetic samples	0.664103	0.7904	0.699717	0.908088	0.699717	0.324324
grid, rbf kernel upsampled	0.676923	0.799363	0.711048	0.912727	0.711048	0.351351
grid, sigmoid kernel	0.902564	0.948509	0.991501	0.909091	0.991501	0.0540541
grid, sigmoid kernel synthetic samples	0.515385	0.661896	0.524079	0.898058	0.524079	0.432432
grid, sigmoid kernel upsampled	0.505128	0.650995	0.509915	0.9	0.509915	0.459459
random forest estimator	0.905128	0.950202	1	0.905128	1	0
random forest estimator synthetic samples	0.858974	0.922861	0.932011	0.913889	0.932011	0.162162
random forest estimator, upsampled	0.907692	0.951351	0.997167	0.909561	0.997167	0.0540541
knn 10	0.910256	0.952767	1	0.909794	1	0.0540541
knn 10 synthetic samples	0.612821	0.744501	0.623229	0.92437	0.623229	0.513514
knn 10 upsampled	0.630769	0.763158	0.657224	0.909804	0.657224	0.378378

TABLE CCLXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.735897	0.846498	0.97931	0.745407	0.97931	0.03
Logistic regression synthetic samples	0.571795	0.663984	0.568966	0.797101	0.568966	0.58
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.74359	0.852941	1	0.74359	1	0
svm, linear kernel, synthetic samples	0.520513	0.602972	0.489655	0.78453	0.489655	0.61
svm, linear kernel upsampled samples	0.579487	0.672	0.57931	0.8	0.57931	0.58
svm, poly	0.746154	0.854197	1	0.745501	1	0.01
svm, poly synthetic samples	0.497436	0.556561	0.424138	0.809211	0.424138	0.71
svm, poly upsampled	0.538462	0.61039	0.486207	0.819767	0.486207	0.69
grid, rbf kernel	0.746154	0.854197	1	0.745501	1	0.01
grid, rbf kernel synthetic samples	0.54359	0.621277	0.503448	0.811111	0.503448	0.66
grid, rbf kernel upsampled	0.564103	0.658635	0.565517	0.788462	0.565517	0.56
grid, sigmoid kernel	0.738462	0.848214	0.982759	0.746073	0.982759	0.03
grid, sigmoid kernel synthetic samples	0.546154	0.632017	0.524138	0.795812	0.524138	0.61
grid, sigmoid kernel upsampled	0.576923	0.661191	0.555172	0.817259	0.555172	0.64
random forest estimator	0.74359	0.852941	1	0.74359	1	0
random forest estimator synthetic samples	0.651282	0.755396	0.724138	0.789474	0.724138	0.44
random forest estimator, upsampled	0.692308	0.805825	0.858621	0.759146	0.858621	0.21
knn 10	0.751282	0.850539	0.951724	0.768802	0.951724	0.17
knn 10 synthetic samples	0.561538	0.658683	0.568966	0.781991	0.568966	0.54
knn 10 upsampled	0.607692	0.71719	0.668966	0.772908	0.668966	0.43

TABLE CCLXXX: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.582051	0.558266	0.547872	0.569061	0.547872	0.613861
Logistic regression synthetic samples	0.582051	0.563003	0.558511	0.567568	0.558511	0.60396
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.6	0.578378	0.569149	0.587912	0.569149	0.628713
svm, linear kernel, synthetic samples	0.597436	0.574526	0.56383	0.585635	0.56383	0.628713
svm, linear kernel upsampled samples	0.607692	0.576177	0.553191	0.601156	0.553191	0.658416
svm, poly	0.597436	0.576819	0.569149	0.584699	0.569149	0.623762
svm, poly synthetic samples	0.597436	0.579088	0.574468	0.583784	0.574468	0.618812
svm, poly upsampled	0.579487	0.56383	0.56383	0.56383	0.56383	0.594059
grid, rbf kernel	0.610256	0.575419	0.547872	0.605882	0.547872	0.668317
grid, rbf kernel synthetic samples	0.607692	0.576177	0.553191	0.601156	0.553191	0.658416
grid, rbf kernel upsampled	0.607692	0.596306	0.601064	0.591623	0.601064	0.613861
grid, sigmoid kernel	0.553846	0.519337	0.5	0.54023	0.5	0.60396
grid, sigmoid kernel synthetic samples	0.561538	0.528926	0.510638	0.548571	0.510638	0.608911
grid, sigmoid kernel upsampled	0.566667	0.544474	0.537234	0.551913	0.537234	0.594059
random forest estimator	0.597436	0.587927	0.595745	0.580311	0.595745	0.59901
random forest estimator synthetic samples	0.587179	0.583979	0.601064	0.567839	0.601064	0.574257
random forest estimator, upsampled	0.55641	0.604119	0.702128	0.53012	0.702128	0.420792
knn 10	0.592308	0.576	0.574468	0.57754	0.574468	0.608911
knn 10 synthetic samples	0.594872	0.579787	0.579787	0.579787	0.579787	0.608911
knn 10 upsampled	0.566667	0.563307	0.579787	0.547739	0.579787	0.554455

TABLE CCLXXXI: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.794872	0.0697674	0.0361446	1	0.0361446	1
Logistic regression synthetic samples	0.55641	0.337165	0.53012	0.247191	0.53012	0.563518
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.787179	0	0	0	0	1
svm, linear kernel, synthetic samples	0.520513	0.329749	0.554217	0.234694	0.554217	0.511401
svm, linear kernel upsampled samples	0.553846	0.309524	0.46988	0.230769	0.46988	0.576547
svm, poly	0.784615	0	0	0	0	0.996743
svm, poly synthetic samples	0.535897	0.341818	0.566265	0.244792	0.566265	0.527687
svm, poly upsampled	0.558974	0.283333	0.409639	0.216561	0.409639	0.599349
grid, rbf kernel	0.787179	0	0	0	0	1
grid, rbf kernel synthetic samples	0.523077	0.316176	0.518072	0.227513	0.518072	0.52443
grid, rbf kernel upsampled	0.548718	0.323077	0.506024	0.237288	0.506024	0.560261
grid, sigmoid kernel	0.764103	0.0612245	0.0361446	0.2	0.0361446	0.960912
grid, sigmoid kernel synthetic samples	0.510256	0.325088	0.554217	0.23	0.554217	0.498371
grid, sigmoid kernel upsampled	0.538462	0.302326	0.46988	0.222857	0.46988	0.557003
random forest estimator	0.792308	0.0470588	0.0240964	1	0.0240964	1
random forest estimator synthetic samples	0.651282	0.298969	0.349398	0.261261	0.349398	0.732899
random forest estimator, upsampled	0.505128	0.313167	0.53012	0.222222	0.53012	0.498371
knn 10	0.787179	0.302521	0.216867	0.5	0.216867	0.941368
knn 10 synthetic samples	0.517949	0.328571	0.554217	0.233503	0.554217	0.508143
knn 10 upsampled	0.458974	0.274914	0.481928	0.192308	0.481928	0.452769

TABLE CCLXXXII: Numerical results of ML methods, using data between time of birth - time of birth + 17 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.961637	0.980443	0.992084	0.969072	0.992084	0
Logistic regression synthetic samples	0.677749	0.804348	0.683377	0.977358	0.683377	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.969309	0.984416	1	0.969309	1	0
svm, linear kernel, synthetic samples	0.644501	0.779715	0.649077	0.97619	0.649077	0.5
svm, linear kernel upsampled samples	0.654731	0.788069	0.662269	0.972868	0.662269	0.416667
svm, poly	0.969309	0.984416	1	0.969309	1	0
svm, poly synthetic samples	0.682864	0.808642	0.691293	0.973978	0.691293	0.416667
svm, poly upsampled	0.705882	0.824962	0.71504	0.97482	0.71504	0.416667
grid, rbf kernel	0.969309	0.984416	1	0.969309	1	0
grid, rbf kernel synthetic samples	0.836317	0.910615	0.860158	0.967359	0.860158	0.0833333
grid, rbf kernel upsampled	0.900256	0.947368	0.926121	0.969613	0.926121	0.0833333
grid, sigmoid kernel	0.964194	0.981723	0.992084	0.971576	0.992084	0.0833333
grid, sigmoid kernel synthetic samples	0.567775	0.716918	0.564644	0.981651	0.564644	0.666667
grid, sigmoid kernel upsampled	0.557545	0.712146	0.564644	0.963964	0.564644	0.333333
random forest estimator	0.969309	0.984416	1	0.969309	1	0
random forest estimator synthetic samples	0.918159	0.957219	0.944591	0.97019	0.944591	0.0833333
random forest estimator, upsampled	0.966752	0.983051	0.994723	0.971649	0.994723	0.0833333
knn 10	0.971867	0.985696	1	0.971795	1	0.0833333
knn 10 synthetic samples	0.680307	0.808576	0.69657	0.963504	0.69657	0.166667
knn 10 upsampled	0.826087	0.904494	0.849604	0.966967	0.849604	0.0833333

TABLE CCLXXXIII: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.887468	0.940217	0.982955	0.901042	0.982955	0.025641
Logistic regression synthetic samples	0.631714	0.759197	0.644886	0.922764	0.644886	0.512821
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.900256	0.94751	1	0.900256	1	0
svm, linear kernel, synthetic samples	0.56266	0.701571	0.571023	0.909502	0.571023	0.487179
svm, linear kernel upsampled samples	0.580563	0.719178	0.596591	0.905172	0.596591	0.435897
svm, poly	0.902813	0.948787	1	0.902564	1	0.025641
svm, poly synthetic samples	0.56266	0.70364	0.576705	0.902222	0.576705	0.435897
svm, poly upsampled	0.590793	0.727891	0.607955	0.90678	0.607955	0.435897
grid, rbf kernel	0.900256	0.94751	1	0.900256	1	0
grid, rbf kernel synthetic samples	0.606138	0.738095	0.616477	0.919492	0.616477	0.512821
grid, rbf kernel upsampled	0.647059	0.775244	0.676136	0.908397	0.676136	0.384615
grid, sigmoid kernel	0.887468	0.940054	0.980114	0.903141	0.980114	0.0512821
grid, sigmoid kernel synthetic samples	0.514066	0.659498	0.522727	0.893204	0.522727	0.435897
grid, sigmoid kernel upsampled	0.475703	0.621072	0.477273	0.888889	0.477273	0.461538
random forest estimator	0.900256	0.94751	1	0.900256	1	0
random forest estimator synthetic samples	0.84399	0.91372	0.917614	0.909859	0.917614	0.179487
random forest estimator, upsampled	0.902813	0.948509	0.994318	0.906736	0.994318	0.0769231
knn 10	0.905371	0.950067	1	0.904884	1	0.0512821
knn 10 synthetic samples	0.588235	0.718039	0.582386	0.936073	0.582386	0.641026
knn 10 upsampled	0.634271	0.762063	0.650568	0.919679	0.650568	0.487179

TABLE CCLXXXIV: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.703325	0.824773	0.978495	0.712794	0.978495	0.0178571
Logistic regression synthetic samples	0.531969	0.627291	0.551971	0.726415	0.551971	0.482143
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.710997	0.831091	0.996416	0.712821	0.996416	0
svm, linear kernel, synthetic samples	0.506394	0.588486	0.494624	0.726316	0.494624	0.535714
svm, linear kernel upsampled samples	0.611253	0.717472	0.691756	0.745174	0.691756	0.410714
svm, poly	0.710997	0.830585	0.992832	0.713918	0.992832	0.00892857
svm, poly synthetic samples	0.508951	0.589744	0.494624	0.730159	0.494624	0.544643
svm, poly upsampled	0.613811	0.718808	0.691756	0.748062	0.691756	0.419643
grid, rbf kernel	0.713555	0.832836	1	0.713555	1	0
grid, rbf kernel synthetic samples	0.539642	0.623431	0.53405	0.748744	0.53405	0.553571
grid, rbf kernel upsampled	0.611253	0.708812	0.663082	0.761317	0.663082	0.482143
grid, sigmoid kernel	0.695652	0.81997	0.971326	0.709424	0.971326	0.00892857
grid, sigmoid kernel synthetic samples	0.534527	0.628571	0.551971	0.729858	0.551971	0.491071
grid, sigmoid kernel upsampled	0.57289	0.670611	0.609319	0.745614	0.609319	0.482143
random forest estimator	0.71867	0.835329	1	0.717224	1	0.0178571
random forest estimator synthetic samples	0.639386	0.745946	0.741935	0.75	0.741935	0.383929
random forest estimator, upsampled	0.680307	0.794069	0.863799	0.734756	0.863799	0.223214
knn 10	0.69821	0.816199	0.939068	0.721763	0.939068	0.0982143
knn 10 synthetic samples	0.534527	0.623967	0.541219	0.736585	0.541219	0.517857
knn 10 upsampled	0.603581	0.704762	0.663082	0.752033	0.663082	0.455357

TABLE CCLXXXV: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.524297	0.507937	0.502618	0.513369	0.502618	0.545
Logistic regression synthetic samples	0.529412	0.510638	0.502618	0.518919	0.502618	0.555
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.537084	0.498615	0.471204	0.529412	0.471204	0.6
svm, linear kernel, synthetic samples	0.557545	0.531165	0.513089	0.550562	0.513089	0.6
svm, linear kernel upsampled samples	0.544757	0.508287	0.481675	0.538012	0.481675	0.605
svm, poly	0.547315	0.525469	0.513089	0.538462	0.513089	0.58
svm, poly synthetic samples	0.549872	0.534392	0.528796	0.540107	0.528796	0.57
svm, poly upsampled	0.534527	0.510753	0.497382	0.524862	0.497382	0.57
grid, rbf kernel	0.580563	0.546961	0.518325	0.578947	0.518325	0.64
grid, rbf kernel synthetic samples	0.575448	0.563158	0.560209	0.566138	0.560209	0.59
grid, rbf kernel upsampled	0.565217	0.540541	0.52356	0.558659	0.52356	0.605
grid, sigmoid kernel	0.524297	0.477528	0.445026	0.515152	0.445026	0.6
grid, sigmoid kernel synthetic samples	0.514066	0.480874	0.460733	0.502857	0.460733	0.565
grid, sigmoid kernel upsampled	0.531969	0.493075	0.465969	0.523529	0.465969	0.595
random forest estimator	0.55243	0.530831	0.518325	0.543956	0.518325	0.585
random forest estimator synthetic samples	0.565217	0.554974	0.554974	0.554974	0.554974	0.575
random forest estimator, upsampled	0.57289	0.617849	0.706806	0.54878	0.706806	0.445
knn 10	0.560102	0.544974	0.539267	0.550802	0.539267	0.58
knn 10 synthetic samples	0.554987	0.544503	0.544503	0.544503	0.544503	0.565
knn 10 upsampled	0.537084	0.53944	0.554974	0.524752	0.554974	0.52

TABLE CCLXXXVI: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.774936	0.0638298	0.0348837	0.375	0.0348837	0.983607
Logistic regression synthetic samples	0.531969	0.357895	0.593023	0.256281	0.593023	0.514754
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.774936	0	0	0	0	0.993443
svm, linear kernel, synthetic samples	0.503836	0.357616	0.627907	0.25	0.627907	0.468852
svm, linear kernel upsampled samples	0.557545	0.361624	0.569767	0.264865	0.569767	0.554098
svm, poly	0.777494	0	0	0	0	0.996721
svm, poly synthetic samples	0.496164	0.370607	0.674419	0.255507	0.674419	0.445902
svm, poly upsampled	0.55243	0.37276	0.604651	0.26943	0.604651	0.537705
grid, rbf kernel	0.780051	0	0	0	0	1
grid, rbf kernel synthetic samples	0.547315	0.365591	0.593023	0.264249	0.593023	0.534426
grid, rbf kernel upsampled	0.537084	0.382253	0.651163	0.270531	0.651163	0.504918
grid, sigmoid kernel	0.744246	0.0384615	0.0232558	0.111111	0.0232558	0.947541
grid, sigmoid kernel synthetic samples	0.493606	0.36129	0.651163	0.25	0.651163	0.44918
grid, sigmoid kernel upsampled	0.534527	0.335766	0.534884	0.244681	0.534884	0.534426
random forest estimator	0.782609	0.0449438	0.0232558	0.666667	0.0232558	0.996721
random forest estimator synthetic samples	0.693095	0.333333	0.348837	0.319149	0.348837	0.790164
random forest estimator, upsampled	0.554987	0.387324	0.639535	0.277778	0.639535	0.531148
knn 10	0.803069	0.237624	0.139535	0.8	0.139535	0.990164
knn 10 synthetic samples	0.55243	0.414716	0.72093	0.29108	0.72093	0.504918
knn 10 upsampled	0.578005	0.362934	0.546512	0.271676	0.546512	0.586885

TABLE CCLXXXVII: Numerical results of ML methods, using data between time of birth - time of birth + 18 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.969309	0.984416	0.994751	0.974293	0.994751	0
Logistic regression synthetic samples	0.659847	0.791862	0.664042	0.98062	0.664042	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.974425	0.987047	1	0.974425	1	0
svm, linear kernel, synthetic samples	0.606138	0.751613	0.611549	0.974895	0.611549	0.4
svm, linear kernel upsampled samples	0.621483	0.763578	0.627297	0.97551	0.627297	0.4
svm, poly	0.974425	0.987047	1	0.974425	1	0
svm, poly synthetic samples	0.611253	0.755627	0.616798	0.975104	0.616798	0.4
svm, poly upsampled	0.662404	0.794393	0.669291	0.977011	0.669291	0.4
grid, rbf kernel	0.974425	0.987047	1	0.974425	1	0
grid, rbf kernel synthetic samples	0.790281	0.881844	0.80315	0.977636	0.80315	0.3
grid, rbf kernel upsampled	0.872123	0.931129	0.887139	0.97971	0.887139	0.3
grid, sigmoid kernel	0.966752	0.983051	0.989501	0.976684	0.989501	0.1
grid, sigmoid kernel synthetic samples	0.531969	0.6914	0.538058	0.966981	0.538058	0.3
grid, sigmoid kernel upsampled	0.531969	0.6914	0.538058	0.966981	0.538058	0.3
random forest estimator	0.974425	0.987047	1	0.974425	1	0
random forest estimator synthetic samples	0.941176	0.969697	0.965879	0.973545	0.965879	0
random forest estimator, upsampled	0.97954	0.98961	1	0.979434	1	0.2
knn 10	0.974425	0.987047	1	0.974425	1	0
knn 10 synthetic samples	0.680307	0.806801	0.685039	0.981203	0.685039	0.5
knn 10 upsampled	0.836317	0.909859	0.847769	0.981763	0.847769	0.4

TABLE CCLXXXVIII: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.892583	0.943089	0.980282	0.908616	0.980282	0.0277778
Logistic regression synthetic samples	0.603581	0.739496	0.619718	0.916667	0.619718	0.444444
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.907928	0.951743	1	0.907928	1	0
svm, linear kernel, synthetic samples	0.498721	0.643636	0.498592	0.907692	0.498592	0.5
svm, linear kernel upsampled samples	0.557545	0.702238	0.574648	0.902655	0.574648	0.388889
svm, poly	0.907928	0.951613	0.997183	0.910026	0.997183	0.0277778
svm, poly synthetic samples	0.521739	0.665474	0.523944	0.911765	0.523944	0.5
svm, poly upsampled	0.601023	0.74	0.625352	0.906122	0.625352	0.361111
grid, rbf kernel	0.907928	0.951743	1	0.907928	1	0
grid, rbf kernel synthetic samples	0.537084	0.683012	0.549296	0.902778	0.549296	0.416667
grid, rbf kernel upsampled	0.585678	0.725424	0.602817	0.910638	0.602817	0.416667
grid, sigmoid kernel	0.895141	0.94452	0.983099	0.908854	0.983099	0.0277778
grid, sigmoid kernel synthetic samples	0.475703	0.622468	0.476056	0.898936	0.476056	0.472222
grid, sigmoid kernel upsampled	0.506394	0.653501	0.512676	0.90099	0.512676	0.444444
random forest estimator	0.907928	0.951743	1	0.907928	1	0
random forest estimator synthetic samples	0.820972	0.900285	0.890141	0.910663	0.890141	0.138889
random forest estimator, upsampled	0.890026	0.941655	0.977465	0.908377	0.977465	0.0277778
knn 10	0.910486	0.95302	1	0.910256	1	0.0277778
knn 10 synthetic samples	0.616368	0.748322	0.628169	0.925311	0.628169	0.5
knn 10 upsampled	0.672634	0.791531	0.684507	0.938224	0.684507	0.555556

TABLE CCLXXXIX: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.69821	0.821752	0.954386	0.721485	0.954386	0.00943396
Logistic regression synthetic samples	0.542199	0.638384	0.554386	0.752381	0.554386	0.509434
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.7289	0.843195	1	0.7289	1	0
svm, linear kernel, synthetic samples	0.526854	0.610526	0.508772	0.763158	0.508772	0.575472
svm, linear kernel upsampled samples	0.590793	0.703704	0.666667	0.745098	0.666667	0.386792
svm, poly	0.726343	0.84101	0.992982	0.729381	0.992982	0.00943396
svm, poly synthetic samples	0.506394	0.588486	0.484211	0.75	0.484211	0.566038
svm, poly upsampled	0.57289	0.692449	0.659649	0.728682	0.659649	0.339623
grid, rbf kernel	0.7289	0.843195	1	0.7289	1	0
grid, rbf kernel synthetic samples	0.511509	0.597895	0.498246	0.747368	0.498246	0.54717
grid, rbf kernel upsampled	0.580563	0.697417	0.663158	0.735409	0.663158	0.358491
grid, sigmoid kernel	0.71867	0.834835	0.975439	0.729659	0.975439	0.0283019
grid, sigmoid kernel synthetic samples	0.493606	0.580508	0.480702	0.73262	0.480702	0.528302
grid, sigmoid kernel upsampled	0.514066	0.607438	0.515789	0.738693	0.515789	0.509434
random forest estimator	0.723785	0.839286	0.989474	0.728682	0.989474	0.00943396
random forest estimator synthetic samples	0.636829	0.755172	0.768421	0.742373	0.768421	0.283019
random forest estimator, upsampled	0.675192	0.791461	0.845614	0.743827	0.845614	0.216981
knn 10	0.723785	0.832298	0.940351	0.746518	0.940351	0.141509
knn 10 synthetic samples	0.55243	0.643585	0.554386	0.76699	0.554386	0.54717
knn 10 upsampled	0.601023	0.70229	0.645614	0.769874	0.645614	0.481132

TABLE CCXC: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.554987	0.546875	0.564516	0.530303	0.564516	0.546341
Logistic regression synthetic samples	0.565217	0.554974	0.569892	0.540816	0.569892	0.560976
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.55243	0.545455	0.564516	0.527638	0.564516	0.541463
svm, linear kernel, synthetic samples	0.554987	0.542105	0.553763	0.530928	0.553763	0.556098
svm, linear kernel upsampled samples	0.539642	0.513514	0.510753	0.516304	0.510753	0.565854
svm, poly	0.56266	0.548813	0.55914	0.53886	0.55914	0.565854
svm, poly synthetic samples	0.557545	0.541114	0.548387	0.534031	0.548387	0.565854
svm, poly upsampled	0.534527	0.47093	0.435484	0.512658	0.435484	0.62439
grid, rbf kernel	0.57289	0.542466	0.532258	0.553073	0.532258	0.609756
grid, rbf kernel synthetic samples	0.565217	0.52514	0.505376	0.546512	0.505376	0.619512
grid, rbf kernel upsampled	0.537084	0.501377	0.489247	0.514124	0.489247	0.580488
grid, sigmoid kernel	0.537084	0.555283	0.607527	0.511312	0.607527	0.473171
grid, sigmoid kernel synthetic samples	0.554987	0.565	0.607527	0.528037	0.607527	0.507317
grid, sigmoid kernel upsampled	0.526854	0.516971	0.532258	0.502538	0.532258	0.521951
random forest estimator	0.554987	0.542105	0.553763	0.530928	0.553763	0.556098
random forest estimator synthetic samples	0.542199	0.530184	0.543011	0.517949	0.543011	0.541463
random forest estimator, upsampled	0.508951	0.573333	0.693548	0.488636	0.693548	0.341463
knn 10	0.570332	0.553191	0.55914	0.547368	0.55914	0.580488
knn 10 synthetic samples	0.567775	0.549333	0.553763	0.544974	0.553763	0.580488
knn 10 upsampled	0.511509	0.50646	0.526882	0.487562	0.526882	0.497561

TABLE CCXCI: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.780051	0.0851064	0.045977	0.571429	0.045977	0.990132
Logistic regression synthetic samples	0.516624	0.31769	0.505747	0.231579	0.505747	0.519737
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.777494	0	0	0	0	1
svm, linear kernel, synthetic samples	0.491049	0.325424	0.551724	0.230769	0.551724	0.473684
svm, linear kernel upsampled samples	0.455243	0.301639	0.528736	0.211009	0.528736	0.434211
svm, poly	0.780051	0.0444444	0.0229885	0.666667	0.0229885	0.996711
svm, poly synthetic samples	0.503836	0.326389	0.54023	0.233831	0.54023	0.493421
svm, poly upsampled	0.434783	0.311526	0.574713	0.213675	0.574713	0.394737
grid, rbf kernel	0.777494	0	0	0	0	1
grid, rbf kernel synthetic samples	0.56266	0.34981	0.528736	0.261364	0.528736	0.572368
grid, rbf kernel upsampled	0.457801	0.320513	0.574713	0.222222	0.574713	0.424342
grid, sigmoid kernel	0.73913	0.0192308	0.0114943	0.0588235	0.0114943	0.947368
grid, sigmoid kernel synthetic samples	0.503836	0.366013	0.643678	0.255708	0.643678	0.463816
grid, sigmoid kernel upsampled	0.475703	0.353312	0.643678	0.243478	0.643678	0.427632
random forest estimator	0.785166	0.0666667	0.0344828	1	0.0344828	1
random forest estimator synthetic samples	0.662404	0.297872	0.321839	0.277228	0.321839	0.759868
random forest estimator, upsampled	0.529412	0.369863	0.62069	0.263415	0.62069	0.503289
knn 10	0.787724	0.252252	0.16092	0.583333	0.16092	0.967105
knn 10 synthetic samples	0.570332	0.412587	0.678161	0.296482	0.678161	0.539474
knn 10 upsampled	0.575448	0.356589	0.528736	0.269006	0.528736	0.588816

TABLE CCXCII: Numerical results of ML methods, using data between time of birth - time of birth + 19 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.964286	0.981818	1	0.964286	1	0
Logistic regression synthetic samples	0.658163	0.791277	0.671958	0.962121	0.671958	0.285714
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.964286	0.981818	1	0.964286	1	0
svm, linear kernel, synthetic samples	0.609694	0.754414	0.621693	0.959184	0.621693	0.285714
svm, linear kernel upsampled samples	0.612245	0.757188	0.626984	0.955645	0.626984	0.214286
svm, poly	0.964286	0.981818	1	0.964286	1	0
svm, poly synthetic samples	0.691327	0.81583	0.708995	0.960573	0.708995	0.214286
svm, poly upsampled	0.683673	0.810398	0.701058	0.960145	0.701058	0.214286
grid, rbf kernel	0.964286	0.981818	1	0.964286	1	0
grid, rbf kernel synthetic samples	0.760204	0.862974	0.783069	0.961039	0.783069	0.142857
grid, rbf kernel upsampled	0.84949	0.917942	0.873016	0.967742	0.873016	0.214286
grid, sigmoid kernel	0.956633	0.977836	0.992063	0.96401	0.992063	0
grid, sigmoid kernel synthetic samples	0.591837	0.74026	0.603175	0.957983	0.603175	0.285714
grid, sigmoid kernel upsampled	0.655612	0.790698	0.674603	0.955056	0.674603	0.142857
random forest estimator	0.964286	0.981818	1	0.964286	1	0
random forest estimator synthetic samples	0.92602	0.961487	0.957672	0.965333	0.957672	0.0714286
random forest estimator, upsampled	0.966837	0.983095	1	0.966752	1	0.0714286
knn 10	0.966837	0.983095	1	0.966752	1	0.0714286
knn 10 synthetic samples	0.653061	0.7875	0.666667	0.961832	0.666667	0.285714
knn 10 upsampled	0.783163	0.877698	0.806878	0.962145	0.806878	0.142857

TABLE CCXCIII: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.885204	0.938942	0.991404	0.891753	0.991404	0.0232558
Logistic regression synthetic samples	0.622449	0.750842	0.638968	0.910204	0.638968	0.488372
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.890306	0.94197	1	0.890306	1	0
svm, linear kernel, synthetic samples	0.543367	0.679785	0.544413	0.904762	0.544413	0.534884
svm, linear kernel upsampled samples	0.607143	0.740741	0.630372	0.897959	0.630372	0.418605
svm, poly	0.890306	0.94197	1	0.890306	1	0
svm, poly synthetic samples	0.553571	0.690265	0.558739	0.902778	0.558739	0.511628
svm, poly upsampled	0.635204	0.766721	0.673352	0.890152	0.673352	0.325581
grid, rbf kernel	0.890306	0.94197	1	0.890306	1	0
grid, rbf kernel synthetic samples	0.571429	0.712329	0.595989	0.885106	0.595989	0.372093
grid, rbf kernel upsampled	0.696429	0.812006	0.73639	0.90493	0.73639	0.372093
grid, sigmoid kernel	0.882653	0.937158	0.982808	0.895561	0.982808	0.0697674
grid, sigmoid kernel synthetic samples	0.55102	0.68231	0.541547	0.921951	0.541547	0.627907
grid, sigmoid kernel upsampled	0.581633	0.714286	0.587393	0.911111	0.587393	0.534884
random forest estimator	0.890306	0.94197	1	0.890306	1	0
random forest estimator synthetic samples	0.813776	0.894049	0.882521	0.905882	0.882521	0.255814
random forest estimator, upsampled	0.890306	0.941337	0.988539	0.898438	0.988539	0.0930233
knn 10	0.895408	0.94452	1	0.894872	1	0.0465116
knn 10 synthetic samples	0.52551	0.665468	0.530086	0.89372	0.530086	0.488372
knn 10 upsampled	0.57398	0.711572	0.590258	0.895652	0.590258	0.44186

TABLE CCXCIV: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.716837	0.834081	0.96875	0.732283	0.96875	0.0192308
Logistic regression synthetic samples	0.512755	0.606186	0.510417	0.746193	0.510417	0.519231
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.734694	0.847059	1	0.734694	1	0
svm, linear kernel, synthetic samples	0.492347	0.564551	0.447917	0.763314	0.447917	0.615385
svm, linear kernel upsampled samples	0.553571	0.654832	0.576389	0.757991	0.576389	0.490385
svm, poly	0.734694	0.847059	1	0.734694	1	0
svm, poly synthetic samples	0.522959	0.589011	0.465278	0.802395	0.465278	0.682692
svm, poly upsampled	0.584184	0.682261	0.607639	0.777778	0.607639	0.519231
grid, rbf kernel	0.734694	0.847059	1	0.734694	1	0
grid, rbf kernel synthetic samples	0.535714	0.617647	0.510417	0.781915	0.510417	0.605769
grid, rbf kernel upsampled	0.596939	0.697318	0.631944	0.777778	0.631944	0.5
grid, sigmoid kernel	0.696429	0.81997	0.940972	0.726542	0.940972	0.0192308
grid, sigmoid kernel synthetic samples	0.512755	0.597895	0.493056	0.759358	0.493056	0.567308
grid, sigmoid kernel upsampled	0.55102	0.646586	0.559028	0.766667	0.559028	0.528846
random forest estimator	0.739796	0.849558	1	0.738462	1	0.0192308
random forest estimator synthetic samples	0.612245	0.722628	0.6875	0.761538	0.6875	0.403846
random forest estimator, upsampled	0.681122	0.794069	0.836806	0.755486	0.836806	0.25
knn 10	0.711735	0.823713	0.916667	0.747875	0.916667	0.144231
knn 10 synthetic samples	0.507653	0.588486	0.479167	0.762431	0.479167	0.586538
knn 10 upsampled	0.57398	0.678227	0.611111	0.761905	0.611111	0.471154

TABLE CCXCV: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.604592	0.577657	0.540816	0.619883	0.540816	0.668367
Logistic regression synthetic samples	0.59949	0.585752	0.566327	0.606557	0.566327	0.632653
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.596939	0.543353	0.479592	0.626667	0.479592	0.714286
svm, linear kernel, synthetic samples	0.596939	0.579787	0.556122	0.605556	0.556122	0.637755
svm, linear kernel upsampled samples	0.540816	0.554455	0.571429	0.538462	0.571429	0.510204
svm, poly	0.609694	0.556522	0.489796	0.644295	0.489796	0.729592
svm, poly synthetic samples	0.59949	0.576819	0.545918	0.611429	0.545918	0.653061
svm, poly upsampled	0.55102	0.541667	0.530612	0.553191	0.530612	0.571429
grid, rbf kernel	0.59949	0.539589	0.469388	0.634483	0.469388	0.729592
grid, rbf kernel synthetic samples	0.602041	0.57377	0.535714	0.617647	0.535714	0.668367
grid, rbf kernel upsampled	0.535714	0.538071	0.540816	0.535354	0.540816	0.530612
grid, sigmoid kernel	0.584184	0.51632	0.443878	0.617021	0.443878	0.72449
grid, sigmoid kernel synthetic samples	0.57398	0.563969	0.55102	0.57754	0.55102	0.596939
grid, sigmoid kernel upsampled	0.55102	0.521739	0.489796	0.55814	0.489796	0.612245
random forest estimator	0.602041	0.564246	0.515306	0.623457	0.515306	0.688776
random forest estimator synthetic samples	0.602041	0.576087	0.540816	0.616279	0.540816	0.663265
random forest estimator, upsampled	0.607143	0.646789	0.719388	0.5875	0.719388	0.494898
knn 10	0.548469	0.517711	0.484694	0.555556	0.484694	0.612245
knn 10 synthetic samples	0.556122	0.534759	0.510204	0.561798	0.510204	0.602041
knn 10 upsampled	0.512755	0.523691	0.535714	0.512195	0.535714	0.489796

TABLE CCXCVI: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.762755	0.0792079	0.0434783	0.444444	0.0434783	0.983333
Logistic regression synthetic samples	0.517857	0.372093	0.608696	0.267943	0.608696	0.49
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.757653	0	0	0	0	0.99
svm, linear kernel, synthetic samples	0.520408	0.373333	0.608696	0.269231	0.608696	0.493333
svm, linear kernel upsampled samples	0.609694	0.37037	0.48913	0.298013	0.48913	0.646667
svm, poly	0.752551	0.020202	0.0108696	0.142857	0.0108696	0.98
svm, poly synthetic samples	0.530612	0.342857	0.521739	0.255319	0.521739	0.533333
svm, poly upsampled	0.553571	0.344569	0.5	0.262857	0.5	0.57
grid, rbf kernel	0.760204	0	0	0	0	0.993333
grid, rbf kernel synthetic samples	0.558673	0.332046	0.467391	0.257485	0.467391	0.586667
grid, rbf kernel upsampled	0.528061	0.291188	0.413043	0.224852	0.413043	0.563333
grid, sigmoid kernel	0.742347	0.0560748	0.0326087	0.2	0.0326087	0.96
grid, sigmoid kernel synthetic samples	0.530612	0.378378	0.608696	0.27451	0.608696	0.506667
grid, sigmoid kernel upsampled	0.581633	0.38806	0.565217	0.295455	0.565217	0.586667
random forest estimator	0.767857	0.0215054	0.0108696	1	0.0108696	1
random forest estimator synthetic samples	0.647959	0.273684	0.282609	0.265306	0.282609	0.76
random forest estimator, upsampled	0.538265	0.373702	0.586957	0.274112	0.586957	0.523333
knn 10	0.762755	0.146789	0.0869565	0.470588	0.0869565	0.97
knn 10 synthetic samples	0.571429	0.377778	0.554348	0.286517	0.554348	0.576667
knn 10 upsampled	0.517857	0.302583	0.445652	0.22905	0.445652	0.54

TABLE CCXCVII: Numerical results of ML methods, using data between time of birth - time of birth + 20 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.962025	0.980645	0.997375	0.964467	0.997375	0
Logistic regression synthetic samples	0.670886	0.798762	0.677165	0.973585	0.677165	0.5
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.962025	0.980645	0.997375	0.964467	0.997375	0
svm, linear kernel, synthetic samples	0.58481	0.732026	0.587927	0.969697	0.587927	0.5
svm, linear kernel upsampled samples	0.587342	0.732348	0.585302	0.97807	0.585302	0.642857
svm, poly	0.964557	0.981959	1	0.964557	1	0
svm, poly synthetic samples	0.597468	0.741463	0.598425	0.974359	0.598425	0.571429
svm, poly upsampled	0.592405	0.736498	0.590551	0.978261	0.590551	0.642857
grid, rbf kernel	0.964557	0.981959	1	0.964557	1	0
grid, rbf kernel synthetic samples	0.827848	0.905028	0.850394	0.967164	0.850394	0.214286
grid, rbf kernel upsampled	0.903797	0.949333	0.934383	0.96477	0.934383	0.0714286
grid, sigmoid kernel	0.95443	0.976684	0.989501	0.964194	0.989501	0
grid, sigmoid kernel synthetic samples	0.481013	0.637168	0.472441	0.978261	0.472441	0.714286
grid, sigmoid kernel upsampled	0.432911	0.588235	0.419948	0.981595	0.419948	0.785714
random forest estimator	0.964557	0.981959	1	0.964557	1	0
random forest estimator synthetic samples	0.936709	0.967148	0.965879	0.968421	0.965879	0.142857
random forest estimator, upsampled	0.962025	0.980595	0.994751	0.966837	0.994751	0.0714286
knn 10	0.967089	0.983226	1	0.967005	1	0.0714286
knn 10 synthetic samples	0.686076	0.812689	0.706037	0.957295	0.706037	0.142857
knn 10 upsampled	0.822785	0.902507	0.850394	0.961424	0.850394	0.0714286

TABLE CCXCVIII: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.898734	0.946381	0.986034	0.909794	0.986034	0.0540541
Logistic regression synthetic samples	0.589873	0.722603	0.589385	0.933628	0.589385	0.594595
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.903797	0.949468	0.997207	0.906091	0.997207	0
svm, linear kernel, synthetic samples	0.526582	0.663063	0.513966	0.93401	0.513966	0.648649
svm, linear kernel upsampled samples	0.579747	0.716724	0.586592	0.921053	0.586592	0.513514
svm, poly	0.903797	0.949468	0.997207	0.906091	0.997207	0
svm, poly synthetic samples	0.536709	0.676106	0.53352	0.922705	0.53352	0.567568
svm, poly upsampled	0.632911	0.760331	0.642458	0.931174	0.642458	0.540541
grid, rbf kernel	0.906329	0.950863	1	0.906329	1	0
grid, rbf kernel synthetic samples	0.6	0.733108	0.606145	0.92735	0.606145	0.540541
grid, rbf kernel upsampled	0.718987	0.827907	0.74581	0.930314	0.74581	0.459459
grid, sigmoid kernel	0.881013	0.936743	0.972067	0.903896	0.972067	0
grid, sigmoid kernel synthetic samples	0.425316	0.559223	0.402235	0.917197	0.402235	0.648649
grid, sigmoid kernel upsampled	0.521519	0.656987	0.505587	0.937824	0.505587	0.675676
random forest estimator	0.906329	0.950863	1	0.906329	1	0
random forest estimator synthetic samples	0.858228	0.921569	0.918994	0.924157	0.918994	0.27027
random forest estimator, upsampled	0.888608	0.940701	0.97486	0.908854	0.97486	0.0540541
knn 10	0.901266	0.947931	0.99162	0.907928	0.99162	0.027027
knn 10 synthetic samples	0.577215	0.713551	0.581006	0.924444	0.581006	0.540541
knn 10 upsampled	0.617722	0.749585	0.631285	0.922449	0.631285	0.486486

TABLE CCXCIX: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.729114	0.840537	0.969072	0.742105	0.969072	0.0576923
Logistic regression synthetic samples	0.536709	0.634731	0.546392	0.757143	0.546392	0.509615
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.736709	0.848397	1	0.736709	1	0
svm, linear kernel, synthetic samples	0.526582	0.614433	0.512027	0.768041	0.512027	0.567308
svm, linear kernel upsampled samples	0.544304	0.647059	0.56701	0.753425	0.56701	0.480769
svm, poly	0.736709	0.847507	0.993127	0.73913	0.993127	0.0192308
svm, poly synthetic samples	0.536709	0.611465	0.494845	0.8	0.494845	0.653846
svm, poly upsampled	0.541772	0.649903	0.57732	0.743363	0.57732	0.442308
grid, rbf kernel	0.739241	0.849635	1	0.738579	1	0.00961538
grid, rbf kernel synthetic samples	0.546835	0.630928	0.525773	0.78866	0.525773	0.605769
grid, rbf kernel upsampled	0.577215	0.691312	0.642612	0.748	0.642612	0.394231
grid, sigmoid kernel	0.724051	0.838996	0.975945	0.735751	0.975945	0.0192308
grid, sigmoid kernel synthetic samples	0.526582	0.617587	0.5189	0.762626	0.5189	0.548077
grid, sigmoid kernel upsampled	0.524051	0.620968	0.52921	0.75122	0.52921	0.509615
random forest estimator	0.736709	0.847507	0.993127	0.73913	0.993127	0.0192308
random forest estimator synthetic samples	0.668354	0.771379	0.75945	0.783688	0.75945	0.413462
random forest estimator, upsampled	0.706329	0.812298	0.862543	0.767584	0.862543	0.269231
knn 10	0.746835	0.847561	0.955326	0.761644	0.955326	0.163462
knn 10 synthetic samples	0.612658	0.702913	0.621993	0.808036	0.621993	0.586538
knn 10 upsampled	0.640506	0.739927	0.694158	0.792157	0.694158	0.490385

TABLE CCC: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.524051	0.525253	0.509804	0.541667	0.509804	0.539267
Logistic regression synthetic samples	0.524051	0.541463	0.544118	0.538835	0.544118	0.502618
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.526582	0.501333	0.460784	0.549708	0.460784	0.596859
svm, linear kernel, synthetic samples	0.521519	0.548926	0.563725	0.534884	0.563725	0.47644
svm, linear kernel upsampled samples	0.526582	0.549398	0.558824	0.540284	0.558824	0.492147
svm, poly	0.534177	0.5	0.45098	0.560976	0.45098	0.623037
svm, poly synthetic samples	0.529114	0.56338	0.588235	0.540541	0.588235	0.465969
svm, poly upsampled	0.524051	0.543689	0.54902	0.538462	0.54902	0.497382
grid, rbf kernel	0.513924	0.510204	0.490196	0.531915	0.490196	0.539267
grid, rbf kernel synthetic samples	0.531646	0.564706	0.588235	0.542986	0.588235	0.471204
grid, rbf kernel upsampled	0.516456	0.544153	0.558824	0.530233	0.558824	0.471204
grid, sigmoid kernel	0.531646	0.481793	0.421569	0.562092	0.421569	0.649215
grid, sigmoid kernel synthetic samples	0.524051	0.552381	0.568627	0.537037	0.568627	0.47644
grid, sigmoid kernel upsampled	0.511392	0.518703	0.509804	0.527919	0.509804	0.513089
random forest estimator	0.597468	0.582677	0.544118	0.627119	0.544118	0.65445
random forest estimator synthetic samples	0.564557	0.567839	0.553922	0.582474	0.553922	0.575916
random forest estimator, upsampled	0.572152	0.625277	0.691176	0.57085	0.691176	0.445026
knn 10	0.536709	0.550369	0.54902	0.551724	0.54902	0.52356
knn 10 synthetic samples	0.529114	0.548544	0.553922	0.543269	0.553922	0.502618
knn 10 upsampled	0.511392	0.532688	0.539216	0.526316	0.539216	0.481675

TABLE CCCI: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.739241	0.0720721	0.040404	0.333333	0.040404	0.972973
Logistic regression synthetic samples	0.511392	0.322807	0.464646	0.247312	0.464646	0.527027
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.749367	0	0	0	0	1
svm, linear kernel, synthetic samples	0.496203	0.334448	0.505051	0.25	0.505051	0.493243
svm, linear kernel upsampled samples	0.503797	0.363636	0.565657	0.267943	0.565657	0.483108
svm, poly	0.749367	0.038835	0.020202	0.5	0.020202	0.993243
svm, poly synthetic samples	0.524051	0.356164	0.525253	0.26943	0.525253	0.523649
svm, poly upsampled	0.501266	0.36246	0.565657	0.266667	0.565657	0.47973
grid, rbf kernel	0.749367	0	0	0	0	1
grid, rbf kernel synthetic samples	0.549367	0.398649	0.59596	0.299492	0.59596	0.533784
grid, rbf kernel upsampled	0.503797	0.402439	0.666667	0.28821	0.666667	0.449324
grid, sigmoid kernel	0.716456	0.0344828	0.020202	0.117647	0.020202	0.949324
grid, sigmoid kernel synthetic samples	0.556962	0.385965	0.555556	0.295699	0.555556	0.557432
grid, sigmoid kernel upsampled	0.491139	0.318644	0.474747	0.239796	0.474747	0.496622
random forest estimator	0.749367	0.019802	0.010101	0.5	0.010101	0.996622
random forest estimator synthetic samples	0.617722	0.297674	0.323232	0.275862	0.323232	0.716216
random forest estimator, upsampled	0.531646	0.408946	0.646465	0.299065	0.646465	0.493243
knn 10	0.75443	0.23622	0.151515	0.535714	0.151515	0.956081
knn 10 synthetic samples	0.524051	0.377483	0.575758	0.280788	0.575758	0.506757
knn 10 upsampled	0.529114	0.371622	0.555556	0.279188	0.555556	0.52027

TABLE CCCII: Numerical results of ML methods, using data between time of birth - time of birth + 21 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.964646	0.982005	1	0.964646	1	0
Logistic regression synthetic samples	0.691919	0.816817	0.712042	0.957746	0.712042	0.142857
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.964646	0.982005	1	0.964646	1	0
svm, linear kernel, synthetic samples	0.666667	0.798165	0.683246	0.959559	0.683246	0.214286
svm, linear kernel upsampled samples	0.676768	0.805471	0.693717	0.960145	0.693717	0.214286
svm, poly	0.964646	0.982005	1	0.964646	1	0
svm, poly synthetic samples	0.679293	0.807284	0.696335	0.960289	0.696335	0.214286
svm, poly upsampled	0.681818	0.809668	0.701571	0.957143	0.701571	0.142857
grid, rbf kernel	0.964646	0.982005	1	0.964646	1	0
grid, rbf kernel synthetic samples	0.79798	0.887006	0.82199	0.96319	0.82199	0.142857
grid, rbf kernel upsampled	0.863636	0.92623	0.887435	0.968571	0.887435	0.214286
grid, sigmoid kernel	0.962121	0.980695	0.997382	0.964557	0.997382	0
grid, sigmoid kernel synthetic samples	0.593434	0.738211	0.594241	0.974249	0.594241	0.571429
grid, sigmoid kernel upsampled	0.522727	0.678024	0.520942	0.970732	0.520942	0.571429
random forest estimator	0.964646	0.982005	1	0.964646	1	0
random forest estimator synthetic samples	0.924242	0.960526	0.955497	0.965608	0.955497	0.0714286
random forest estimator, upsampled	0.967172	0.983269	1	0.967089	1	0.0714286
knn 10	0.967172	0.983269	1	0.967089	1	0.0714286
knn 10 synthetic samples	0.709596	0.827068	0.719895	0.971731	0.719895	0.428571
knn 10 upsampled	0.823232	0.902507	0.848168	0.964286	0.848168	0.142857

TABLE CCCIII: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.90404	0.949602	1	0.90404	1	0
Logistic regression synthetic samples	0.638889	0.766721	0.656425	0.921569	0.656425	0.473684
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.90404	0.949602	1	0.90404	1	0
svm, linear kernel, synthetic samples	0.59596	0.73064	0.606145	0.919492	0.606145	0.5
svm, linear kernel upsampled samples	0.616162	0.748344	0.631285	0.918699	0.631285	0.473684
svm, poly	0.90404	0.949602	1	0.90404	1	0
svm, poly synthetic samples	0.588384	0.725126	0.600559	0.914894	0.600559	0.473684
svm, poly upsampled	0.674242	0.795563	0.701117	0.919414	0.701117	0.421053
grid, rbf kernel	0.90404	0.949602	1	0.90404	1	0
grid, rbf kernel synthetic samples	0.608586	0.741235	0.620112	0.921162	0.620112	0.5
grid, rbf kernel upsampled	0.684343	0.805599	0.723464	0.908772	0.723464	0.315789
grid, sigmoid kernel	0.893939	0.944	0.988827	0.903061	0.988827	0
grid, sigmoid kernel synthetic samples	0.441919	0.583804	0.432961	0.895954	0.432961	0.526316
grid, sigmoid kernel upsampled	0.414141	0.555556	0.405028	0.884146	0.405028	0.5
random forest estimator	0.90404	0.949602	1	0.90404	1	0
random forest estimator synthetic samples	0.813131	0.894886	0.879888	0.910405	0.879888	0.184211
random forest estimator, upsampled	0.906566	0.950469	0.99162	0.912596	0.99162	0.105263
knn 10	0.90404	0.949333	0.994413	0.908163	0.994413	0.0526316
knn 10 synthetic samples	0.55303	0.692174	0.555866	0.917051	0.555866	0.526316
knn 10 upsampled	0.611111	0.745033	0.628492	0.914634	0.628492	0.447368

TABLE CCCIV: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.724747	0.838039	0.986014	0.728682	0.986014	0.0454545
Logistic regression synthetic samples	0.545455	0.635628	0.548951	0.754808	0.548951	0.536364
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.722222	0.83871	1	0.722222	1	0
svm, linear kernel, synthetic samples	0.517677	0.599581	0.5	0.748691	0.5	0.563636
svm, linear kernel upsampled samples	0.568182	0.662722	0.587413	0.760181	0.587413	0.518182
svm, poly	0.727273	0.841176	1	0.725888	1	0.0181818
svm, poly synthetic samples	0.522727	0.582781	0.461538	0.790419	0.461538	0.681818
svm, poly upsampled	0.558081	0.646465	0.559441	0.76555	0.559441	0.554545
grid, rbf kernel	0.722222	0.83871	1	0.722222	1	0
grid, rbf kernel synthetic samples	0.512626	0.579521	0.465035	0.768786	0.465035	0.636364
grid, rbf kernel upsampled	0.580808	0.67451	0.601399	0.767857	0.601399	0.527273
grid, sigmoid kernel	0.717172	0.832836	0.975524	0.726562	0.975524	0.0454545
grid, sigmoid kernel synthetic samples	0.492424	0.571429	0.468531	0.73224	0.468531	0.554545
grid, sigmoid kernel upsampled	0.588384	0.68714	0.625874	0.761702	0.625874	0.490909
random forest estimator	0.727273	0.841176	1	0.725888	1	0.0181818
random forest estimator synthetic samples	0.623737	0.74087	0.744755	0.737024	0.744755	0.309091
random forest estimator, upsampled	0.70202	0.80719	0.863636	0.757669	0.863636	0.281818
knn 10	0.69697	0.814815	0.923077	0.729282	0.923077	0.109091
knn 10 synthetic samples	0.54798	0.635438	0.545455	0.760976	0.545455	0.554545
knn 10 upsampled	0.573232	0.673114	0.608392	0.753247	0.608392	0.481818

TABLE CCCV: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.585859	0.568421	0.534653	0.606742	0.534653	0.639175
Logistic regression synthetic samples	0.585859	0.583756	0.569307	0.598958	0.569307	0.603093
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.580808	0.569948	0.544554	0.597826	0.544554	0.618557
svm, linear kernel, synthetic samples	0.578283	0.589681	0.594059	0.585366	0.594059	0.561856
svm, linear kernel upsampled samples	0.583333	0.60241	0.618812	0.586854	0.618812	0.546392
svm, poly	0.563131	0.512676	0.450495	0.594771	0.450495	0.680412
svm, poly synthetic samples	0.573232	0.574307	0.564356	0.584615	0.564356	0.582474
svm, poly upsampled	0.570707	0.591346	0.608911	0.574766	0.608911	0.530928
grid, rbf kernel	0.578283	0.547425	0.5	0.60479	0.5	0.659794
grid, rbf kernel synthetic samples	0.570707	0.572864	0.564356	0.581633	0.564356	0.57732
grid, rbf kernel upsampled	0.588384	0.632054	0.693069	0.580913	0.693069	0.479381
grid, sigmoid kernel	0.585859	0.536723	0.470297	0.625	0.470297	0.706186
grid, sigmoid kernel synthetic samples	0.585859	0.596059	0.59901	0.593137	0.59901	0.572165
grid, sigmoid kernel upsampled	0.55303	0.535433	0.50495	0.569832	0.50495	0.603093
random forest estimator	0.593434	0.54902	0.485149	0.632258	0.485149	0.706186
random forest estimator synthetic samples	0.585859	0.566138	0.529703	0.607955	0.529703	0.64433
random forest estimator, upsampled	0.573232	0.620225	0.683168	0.567901	0.683168	0.458763
knn 10	0.588384	0.591479	0.584158	0.598985	0.584158	0.592784
knn 10 synthetic samples	0.583333	0.600484	0.613861	0.587678	0.613861	0.551546
knn 10 upsampled	0.560606	0.589623	0.618812	0.563063	0.618812	0.5

TABLE CCCVI: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.755051	0.0934579	0.0520833	0.454545	0.0520833	0.98
Logistic regression synthetic samples	0.560606	0.350746	0.489583	0.273256	0.489583	0.583333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.757576	0	0	0	0	1
svm, linear kernel, synthetic samples	0.489899	0.360759	0.59375	0.259091	0.59375	0.456667
svm, linear kernel upsampled samples	0.532828	0.372881	0.572917	0.276382	0.572917	0.52
svm, poly	0.755051	0.039604	0.0208333	0.4	0.0208333	0.99
svm, poly synthetic samples	0.482323	0.373089	0.635417	0.264069	0.635417	0.433333
svm, poly upsampled	0.542929	0.378007	0.572917	0.282051	0.572917	0.533333
grid, rbf kernel	0.760101	0.0206186	0.0104167	1	0.0104167	1
grid, rbf kernel synthetic samples	0.484848	0.381818	0.65625	0.269231	0.65625	0.43
grid, rbf kernel upsampled	0.530303	0.358621	0.541667	0.268041	0.541667	0.526667
grid, sigmoid kernel	0.739899	0.0550459	0.03125	0.230769	0.03125	0.966667
grid, sigmoid kernel synthetic samples	0.606061	0.390625	0.520833	0.3125	0.520833	0.633333
grid, sigmoid kernel upsampled	0.585859	0.354331	0.46875	0.28481	0.46875	0.623333
random forest estimator	0.757576	0.0204082	0.0104167	0.5	0.0104167	0.996667
random forest estimator synthetic samples	0.659091	0.334975	0.354167	0.317757	0.354167	0.756667
random forest estimator, upsampled	0.515152	0.376623	0.604167	0.273585	0.604167	0.486667
knn 10	0.760101	0.201681	0.125	0.521739	0.125	0.963333
knn 10 synthetic samples	0.545455	0.352518	0.510417	0.269231	0.510417	0.556667
knn 10 upsampled	0.555556	0.338346	0.46875	0.264706	0.46875	0.583333

TABLE CCCVII: Numerical results of ML methods, using data between time of birth - time of birth + 22 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.967254	0.983355	0.994819	0.972152	0.994819	0
Logistic regression synthetic samples	0.662469	0.794479	0.670984	0.973684	0.670984	0.363636
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.972292	0.985951	1	0.972292	1	0
svm, linear kernel, synthetic samples	0.586902	0.734628	0.588083	0.978448	0.588083	0.545455
svm, linear kernel upsampled samples	0.61461	0.757528	0.619171	0.97551	0.619171	0.454545
svm, poly	0.972292	0.985951	1	0.972292	1	0
svm, poly synthetic samples	0.607053	0.750799	0.608808	0.979167	0.608808	0.545455
svm, poly upsampled	0.604534	0.749601	0.608808	0.975104	0.608808	0.454545
grid, rbf kernel	0.972292	0.985951	1	0.972292	1	0
grid, rbf kernel synthetic samples	0.79597	0.885106	0.80829	0.978056	0.80829	0.363636
grid, rbf kernel upsampled	0.879093	0.935135	0.896373	0.977401	0.896373	0.272727
grid, sigmoid kernel	0.957179	0.978121	0.984456	0.971867	0.984456	0
grid, sigmoid kernel synthetic samples	0.539043	0.693467	0.536269	0.981043	0.536269	0.636364
grid, sigmoid kernel upsampled	0.501259	0.660959	0.5	0.974747	0.5	0.545455
random forest estimator	0.972292	0.985951	1	0.972292	1	0
random forest estimator synthetic samples	0.934509	0.965969	0.955959	0.97619	0.955959	0.181818
random forest estimator, upsampled	0.974811	0.987212	1	0.974747	1	0.0909091
knn 10	0.974811	0.987212	1	0.974747	1	0.0909091
knn 10 synthetic samples	0.672544	0.801223	0.678756	0.977612	0.678756	0.454545
knn 10 upsampled	0.816121	0.89847	0.836788	0.96997	0.836788	0.0909091

TABLE CCCVIII: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.899244	0.946667	0.994398	0.903308	0.994398	0.05
Logistic regression synthetic samples	0.574307	0.713073	0.588235	0.905172	0.588235	0.45
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.899244	0.94695	1	0.899244	1	0
svm, linear kernel, synthetic samples	0.549118	0.686515	0.54902	0.915888	0.54902	0.55
svm, linear kernel upsampled samples	0.599496	0.734558	0.616246	0.909091	0.616246	0.45
svm, poly	0.899244	0.94695	1	0.899244	1	0
svm, poly synthetic samples	0.561713	0.695804	0.557423	0.925581	0.557423	0.6
svm, poly upsampled	0.639798	0.768233	0.663866	0.911538	0.663866	0.425
grid, rbf kernel	0.899244	0.94695	1	0.899244	1	0
grid, rbf kernel synthetic samples	0.647355	0.773463	0.669468	0.915709	0.669468	0.45
grid, rbf kernel upsampled	0.690176	0.809892	0.733894	0.903448	0.733894	0.3
grid, sigmoid kernel	0.889169	0.941333	0.988796	0.898219	0.988796	0
grid, sigmoid kernel synthetic samples	0.498741	0.638838	0.492997	0.907216	0.492997	0.55
grid, sigmoid kernel upsampled	0.483627	0.619666	0.467787	0.917582	0.467787	0.625
random forest estimator	0.899244	0.94695	1	0.899244	1	0
random forest estimator synthetic samples	0.811083	0.893617	0.882353	0.905172	0.882353	0.175
random forest estimator, upsampled	0.88665	0.939435	0.977591	0.904145	0.977591	0.075
knn 10	0.896725	0.945406	0.994398	0.901015	0.994398	0.025
knn 10 synthetic samples	0.589421	0.72605	0.605042	0.907563	0.605042	0.45
knn 10 upsampled	0.652393	0.778846	0.680672	0.910112	0.680672	0.4

TABLE CCCIX: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.730479	0.842415	0.972789	0.742857	0.972789	0.038835
Logistic regression synthetic samples	0.521411	0.616935	0.520408	0.757426	0.520408	0.524272
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.740554	0.850941	1	0.740554	1	0
svm, linear kernel, synthetic samples	0.523929	0.607069	0.496599	0.780749	0.496599	0.601942
svm, linear kernel upsampled samples	0.554156	0.646707	0.55102	0.782609	0.55102	0.563107
svm, poly	0.732997	0.845481	0.986395	0.739796	0.986395	0.00970874
svm, poly synthetic samples	0.506297	0.564444	0.431973	0.814103	0.431973	0.718447
svm, poly upsampled	0.574307	0.664016	0.568027	0.799043	0.568027	0.592233
grid, rbf kernel	0.743073	0.852174	1	0.742424	1	0.00970874
grid, rbf kernel synthetic samples	0.526448	0.601695	0.482993	0.797753	0.482993	0.650485
grid, rbf kernel upsampled	0.576826	0.676923	0.598639	0.778761	0.598639	0.514563
grid, sigmoid kernel	0.717884	0.835294	0.965986	0.735751	0.965986	0.00970874
grid, sigmoid kernel synthetic samples	0.483627	0.57732	0.47619	0.732984	0.47619	0.504854
grid, sigmoid kernel upsampled	0.493703	0.592292	0.496599	0.733668	0.496599	0.485437
random forest estimator	0.740554	0.850073	0.993197	0.743003	0.993197	0.0194175
random forest estimator synthetic samples	0.644836	0.752197	0.727891	0.778182	0.727891	0.407767
random forest estimator, upsampled	0.702771	0.807818	0.843537	0.775	0.843537	0.300971
knn 10	0.735516	0.842105	0.952381	0.754717	0.952381	0.116505
knn 10 synthetic samples	0.539043	0.636183	0.544218	0.76555	0.544218	0.524272
knn 10 upsampled	0.604534	0.717117	0.676871	0.762452	0.676871	0.398058

TABLE CCCX: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.549118	0.512262	0.474747	0.556213	0.474747	0.623116
Logistic regression synthetic samples	0.564232	0.543536	0.520202	0.569061	0.520202	0.60804
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.571788	0.532967	0.489899	0.584337	0.489899	0.653266
svm, linear kernel, synthetic samples	0.584383	0.573643	0.560606	0.587302	0.560606	0.60804
svm, linear kernel upsampled samples	0.541562	0.538071	0.535354	0.540816	0.535354	0.547739
svm, poly	0.56927	0.495575	0.424242	0.595745	0.424242	0.713568
svm, poly synthetic samples	0.564232	0.538667	0.510101	0.570621	0.510101	0.61809
svm, poly upsampled	0.559194	0.523161	0.484848	0.568047	0.484848	0.633166
grid, rbf kernel	0.571788	0.519774	0.464646	0.589744	0.464646	0.678392
grid, rbf kernel synthetic samples	0.559194	0.538259	0.515152	0.563536	0.515152	0.603015
grid, rbf kernel upsampled	0.549118	0.532637	0.515152	0.551351	0.515152	0.582915
grid, sigmoid kernel	0.541562	0.518519	0.494949	0.544444	0.494949	0.58794
grid, sigmoid kernel synthetic samples	0.541562	0.535714	0.530303	0.541237	0.530303	0.552764
grid, sigmoid kernel upsampled	0.574307	0.55643	0.535354	0.579235	0.535354	0.613065
random forest estimator	0.624685	0.600536	0.565657	0.64	0.565657	0.683417
random forest estimator synthetic samples	0.612091	0.590426	0.560606	0.623596	0.560606	0.663317
random forest estimator, upsampled	0.566751	0.624454	0.722222	0.55	0.722222	0.41206
knn 10	0.571788	0.566327	0.560606	0.572165	0.560606	0.582915
knn 10 synthetic samples	0.559194	0.561404	0.565657	0.557214	0.565657	0.552764
knn 10 upsampled	0.554156	0.58156	0.621212	0.546667	0.621212	0.487437

TABLE CCCXI: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.748111	0.0740741	0.039604	0.571429	0.039604	0.989865
Logistic regression synthetic samples	0.581864	0.380597	0.50495	0.305389	0.50495	0.608108
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.745592	0	0	0	0	1
svm, linear kernel, synthetic samples	0.554156	0.423453	0.643564	0.315534	0.643564	0.523649
svm, linear kernel upsampled samples	0.536524	0.402597	0.613861	0.299517	0.613861	0.510135
svm, poly	0.748111	0.0384615	0.019802	0.666667	0.019802	0.996622
svm, poly synthetic samples	0.566751	0.441558	0.673267	0.328502	0.673267	0.530405
svm, poly upsampled	0.516373	0.407407	0.653465	0.295964	0.653465	0.469595
grid, rbf kernel	0.745592	0	0	0	0	1
grid, rbf kernel synthetic samples	0.564232	0.413559	0.60396	0.314433	0.60396	0.550676
grid, rbf kernel upsampled	0.508816	0.37299	0.574257	0.27619	0.574257	0.486486
grid, sigmoid kernel	0.72796	0.0689655	0.039604	0.266667	0.039604	0.962838
grid, sigmoid kernel synthetic samples	0.554156	0.415842	0.623762	0.311881	0.623762	0.530405
grid, sigmoid kernel upsampled	0.498741	0.402402	0.663366	0.288793	0.663366	0.442568
random forest estimator	0.75063	0.038835	0.019802	1	0.019802	1
random forest estimator synthetic samples	0.680101	0.35533	0.346535	0.364583	0.346535	0.793919
random forest estimator, upsampled	0.518892	0.397476	0.623762	0.291667	0.623762	0.483108
knn 10	0.760705	0.24	0.148515	0.625	0.148515	0.969595
knn 10 synthetic samples	0.581864	0.41958	0.594059	0.324324	0.594059	0.577703
knn 10 upsampled	0.528967	0.374582	0.554455	0.282828	0.554455	0.52027

TABLE CCCXII: Numerical results of ML methods, using data between time of birth - time of birth + 23 hours ph = 7.3

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.97733	0.988535	0.997429	0.979798	0.997429	0
Logistic regression synthetic samples	0.680101	0.807867	0.686375	0.981618	0.686375	0.375
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.979849	0.989822	1	0.979849	1	0
svm, linear kernel, synthetic samples	0.61461	0.759055	0.619537	0.979675	0.619537	0.375
svm, linear kernel upsampled samples	0.609572	0.755134	0.614396	0.979508	0.614396	0.375
svm, poly	0.979849	0.989822	1	0.979849	1	0
svm, poly synthetic samples	0.672544	0.801829	0.676093	0.985019	0.676093	0.5
svm, poly upsampled	0.634761	0.775194	0.642674	0.976562	0.642674	0.25
grid, rbf kernel	0.979849	0.989822	1	0.979849	1	0
grid, rbf kernel synthetic samples	0.836272	0.910097	0.845758	0.98503	0.845758	0.375
grid, rbf kernel upsampled	0.901763	0.947931	0.912596	0.986111	0.912596	0.375
grid, sigmoid kernel	0.969773	0.984655	0.989717	0.979644	0.989717	0
grid, sigmoid kernel synthetic samples	0.523929	0.683417	0.524422	0.980769	0.524422	0.5
grid, sigmoid kernel upsampled	0.516373	0.673469	0.508997	0.994975	0.508997	0.875
random forest estimator	0.979849	0.989822	1	0.979849	1	0
random forest estimator synthetic samples	0.929471	0.963255	0.943445	0.983914	0.943445	0.25
random forest estimator, upsampled	0.979849	0.989796	0.997429	0.982278	0.997429	0.125
knn 10	0.982368	0.991083	1	0.982323	1	0.125
knn 10 synthetic samples	0.667506	0.79878	0.673522	0.981273	0.673522	0.375
knn 10 upsampled	0.79597	0.886076	0.809769	0.978261	0.809769	0.125

TABLE CCCXIII: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.1

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.906801	0.950993	0.991713	0.913486	0.991713	0.0285714
Logistic regression synthetic samples	0.612091	0.746711	0.627072	0.922764	0.627072	0.457143
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.90932	0.952507	0.997238	0.911616	0.997238	0
svm, linear kernel, synthetic samples	0.549118	0.690846	0.552486	0.921659	0.552486	0.514286
svm, linear kernel upsampled samples	0.564232	0.708263	0.58011	0.909091	0.58011	0.4
svm, poly	0.90932	0.952507	0.997238	0.911616	0.997238	0
svm, poly synthetic samples	0.528967	0.672504	0.530387	0.91866	0.530387	0.514286
svm, poly upsampled	0.551637	0.694158	0.558011	0.918182	0.558011	0.485714
grid, rbf kernel	0.911839	0.953887	1	0.911839	1	0
grid, rbf kernel synthetic samples	0.576826	0.716216	0.585635	0.921739	0.585635	0.485714
grid, rbf kernel upsampled	0.644836	0.772947	0.662983	0.926641	0.662983	0.457143
grid, sigmoid kernel	0.896725	0.945406	0.980663	0.912596	0.980663	0.0285714
grid, sigmoid kernel synthetic samples	0.521411	0.667832	0.527624	0.909524	0.527624	0.457143
grid, sigmoid kernel upsampled	0.518892	0.667826	0.530387	0.901408	0.530387	0.4
random forest estimator	0.911839	0.953887	1	0.911839	1	0
random forest estimator synthetic samples	0.846348	0.915395	0.911602	0.91922	0.911602	0.171429
random forest estimator, upsampled	0.894207	0.94385	0.975138	0.914508	0.975138	0.0571429
knn 10	0.906801	0.950993	0.991713	0.913486	0.991713	0.0285714
knn 10 synthetic samples	0.596977	0.731544	0.60221	0.931624	0.60221	0.542857
knn 10 upsampled	0.619647	0.756058	0.646409	0.910506	0.646409	0.342857

TABLE CCCXIV: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.15

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.717884	0.834808	0.969178	0.733161	0.969178	0.0190476
Logistic regression synthetic samples	0.498741	0.589691	0.489726	0.740933	0.489726	0.52381
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.738035	0.848837	1	0.737374	1	0.00952381
svm, linear kernel, synthetic samples	0.483627	0.549451	0.428082	0.766871	0.428082	0.638095
svm, linear kernel upsampled samples	0.471033	0.541485	0.424658	0.746988	0.424658	0.6
svm, poly	0.732997	0.845481	0.993151	0.736041	0.993151	0.00952381
svm, poly synthetic samples	0.476071	0.535714	0.410959	0.769231	0.410959	0.657143
svm, poly upsampled	0.501259	0.565789	0.441781	0.786585	0.441781	0.666667
grid, rbf kernel	0.738035	0.848837	1	0.737374	1	0.00952381
grid, rbf kernel synthetic samples	0.493703	0.556291	0.431507	0.782609	0.431507	0.666667
grid, rbf kernel upsampled	0.541562	0.619247	0.506849	0.795699	0.506849	0.638095
grid, sigmoid kernel	0.722922	0.835821	0.958904	0.740741	0.958904	0.0666667
grid, sigmoid kernel synthetic samples	0.483627	0.55914	0.445205	0.751445	0.445205	0.590476
grid, sigmoid kernel upsampled	0.491184	0.568376	0.455479	0.755682	0.455479	0.590476
random forest estimator	0.745592	0.852123	0.996575	0.744246	0.996575	0.047619
random forest estimator synthetic samples	0.65995	0.761062	0.736301	0.787546	0.736301	0.447619
random forest estimator, upsampled	0.697733	0.80456	0.84589	0.767081	0.84589	0.285714
knn 10	0.70529	0.817473	0.89726	0.750716	0.89726	0.171429
knn 10 synthetic samples	0.511335	0.592437	0.482877	0.766304	0.482877	0.590476
knn 10 upsampled	0.576826	0.676923	0.60274	0.77193	0.60274	0.504762

TABLE CCCXV: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.2

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.521411	0.512821	0.515464	0.510204	0.515464	0.527094
Logistic regression synthetic samples	0.516373	0.515152	0.525773	0.50495	0.525773	0.507389
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.539043	0.509383	0.489691	0.530726	0.489691	0.586207
svm, linear kernel, synthetic samples	0.516373	0.5	0.494845	0.505263	0.494845	0.536946
svm, linear kernel upsampled samples	0.531486	0.537313	0.556701	0.519231	0.556701	0.507389
svm, poly	0.536524	0.5	0.474227	0.528736	0.474227	0.596059
svm, poly synthetic samples	0.534005	0.526854	0.530928	0.522843	0.530928	0.536946
svm, poly upsampled	0.518892	0.53528	0.56701	0.506912	0.56701	0.472906
grid, rbf kernel	0.544081	0.509485	0.484536	0.537143	0.484536	0.600985
grid, rbf kernel synthetic samples	0.541562	0.521053	0.510309	0.532258	0.510309	0.571429
grid, rbf kernel upsampled	0.541562	0.533333	0.536082	0.530612	0.536082	0.546798
grid, sigmoid kernel	0.528967	0.490463	0.463918	0.520231	0.463918	0.591133
grid, sigmoid kernel synthetic samples	0.534005	0.521964	0.520619	0.523316	0.520619	0.546798
grid, sigmoid kernel upsampled	0.521411	0.515306	0.520619	0.510101	0.520619	0.522167
random forest estimator	0.602015	0.572973	0.546392	0.602273	0.546392	0.655172
random forest estimator synthetic samples	0.594458	0.568365	0.546392	0.592179	0.546392	0.640394
random forest estimator, upsampled	0.561713	0.589623	0.64433	0.543478	0.64433	0.482759
knn 10	0.544081	0.53944	0.546392	0.532663	0.546392	0.541872
knn 10 synthetic samples	0.541562	0.540404	0.551546	0.529703	0.551546	0.53202
knn 10 upsampled	0.536524	0.546798	0.572165	0.523585	0.572165	0.502463

TABLE CCCXVI: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.25

Method	Accuracy	F1_score	Recall	Precision	Sensitivity	Specificity
Logistic regression	0.758186	0.0769231	0.0412371	0.571429	0.0412371	0.99
Logistic regression synthetic samples	0.589421	0.407273	0.57732	0.314607	0.57732	0.593333
upsampled log regression	0	0	0	0	0	0
svm, linear kernel	0.755668	0	0	0	0	1
svm, linear kernel, synthetic samples	0.549118	0.401338	0.618557	0.29703	0.618557	0.526667
svm, linear kernel upsampled samples	0.473552	0.352941	0.587629	0.252212	0.587629	0.436667
svm, poly	0.755668	0	0	0	0	1
svm, poly synthetic samples	0.536524	0.37415	0.56701	0.279188	0.56701	0.526667
svm, poly upsampled	0.516373	0.368421	0.57732	0.270531	0.57732	0.496667
grid, rbf kernel	0.755668	0	0	0	0	1
grid, rbf kernel synthetic samples	0.531486	0.34507	0.505155	0.262032	0.505155	0.54
grid, rbf kernel upsampled	0.503778	0.327645	0.494845	0.244898	0.494845	0.506667
grid, sigmoid kernel	0.745592	0.0560748	0.0309278	0.3	0.0309278	0.976667
grid, sigmoid kernel synthetic samples	0.551637	0.402685	0.618557	0.298507	0.618557	0.53
grid, sigmoid kernel upsampled	0.521411	0.340278	0.505155	0.256545	0.505155	0.526667
random forest estimator	0.758186	0.0204082	0.0103093	1	0.0103093	1
random forest estimator synthetic samples	0.685139	0.31694	0.298969	0.337209	0.298969	0.81
random forest estimator, upsampled	0.549118	0.401338	0.618557	0.29703	0.618557	0.526667
knn 10	0.760705	0.214876	0.134021	0.541667	0.134021	0.963333
knn 10 synthetic samples	0.531486	0.34965	0.515464	0.26455	0.515464	0.536667
knn 10 upsampled	0.546599	0.375	0.556701	0.282723	0.556701	0.543333

TABLE CCCXVII: Numerical results of ML methods, using data between time of birth - time of birth + 24 hours ph = 7.3

APPENDIX F
PLOTS OF THE METRICS OF THE DIFFERENT ML METHODS

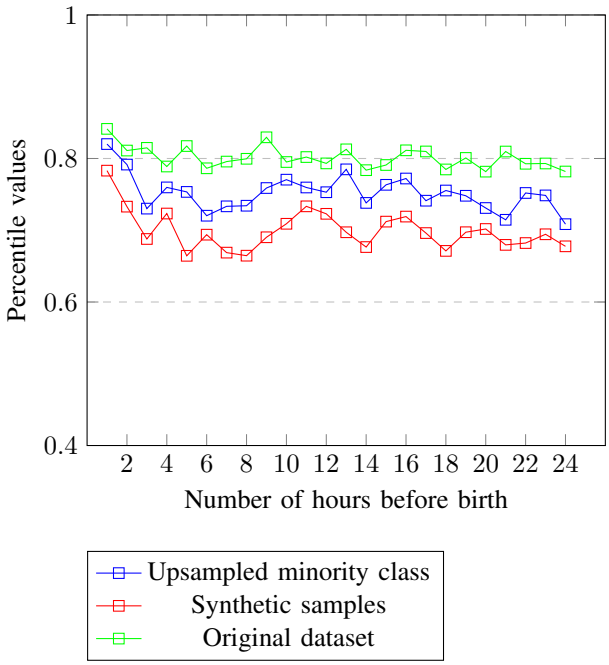

Fig. 15: Accuracy of random forest method, depending on the number of hours included in the analysis

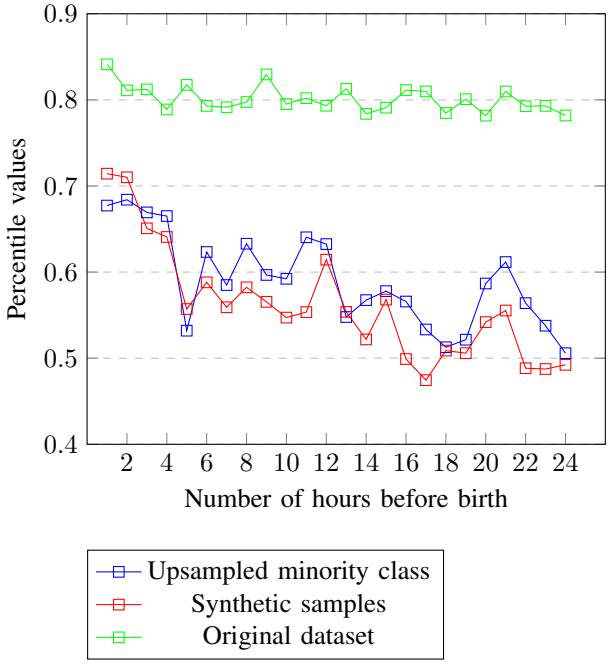

Fig. 16: Accuracy of SVM with linear kernel, depending on the number of hours included in the analysis

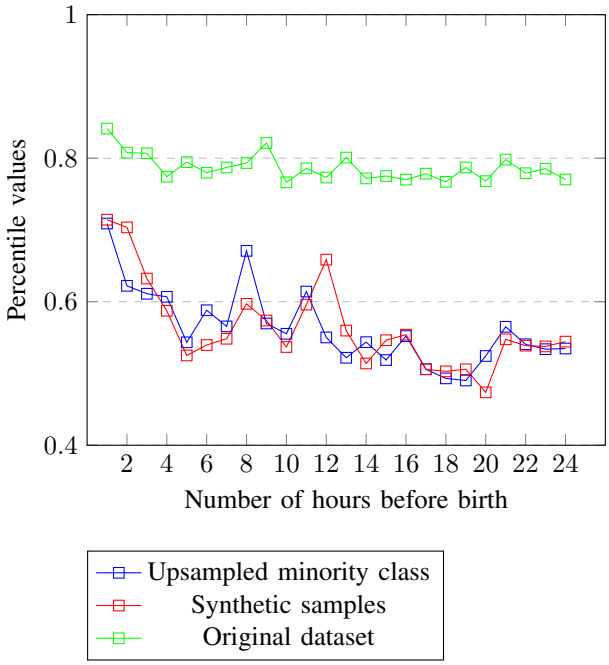

Fig. 17: Accuracy of SVM with sigmoid kernel, depending on the number of hours included in the analysis

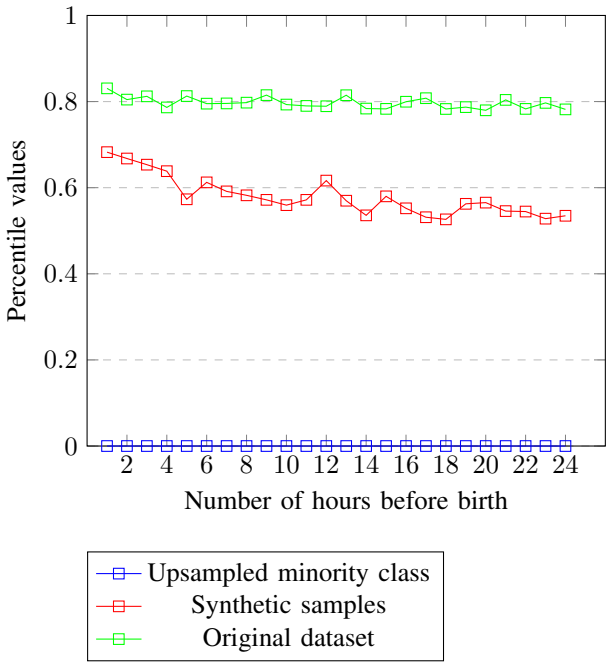

Fig. 18: Accuracy of logistic regresson, depending on the number of hours included in the analysis

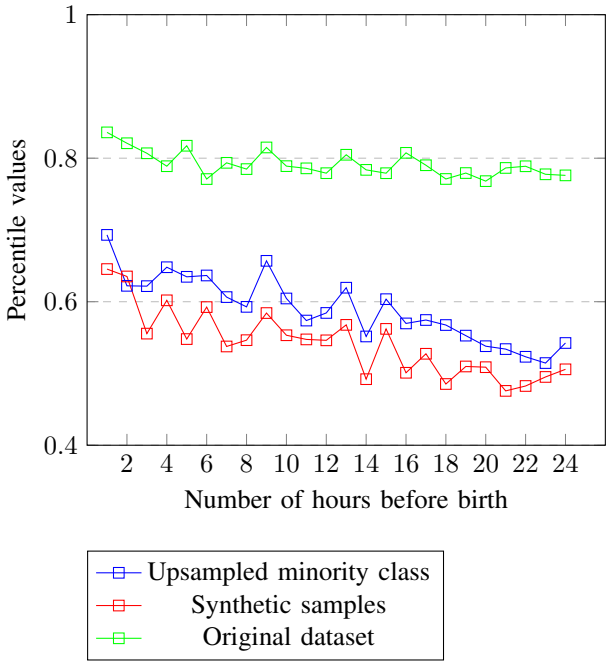

Fig. 19: Accuracy of KNN, depending on the number of hours included in the analysis

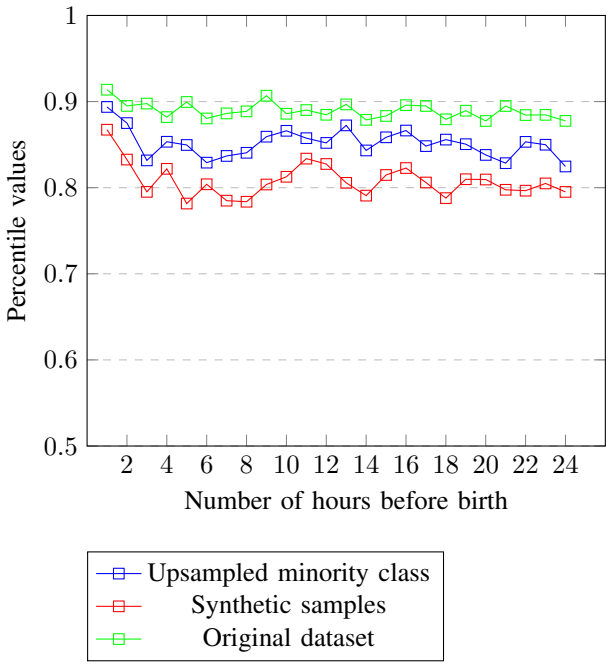

Fig. 20: F1 score of random forest method, depending on the number of hours included in the analysis

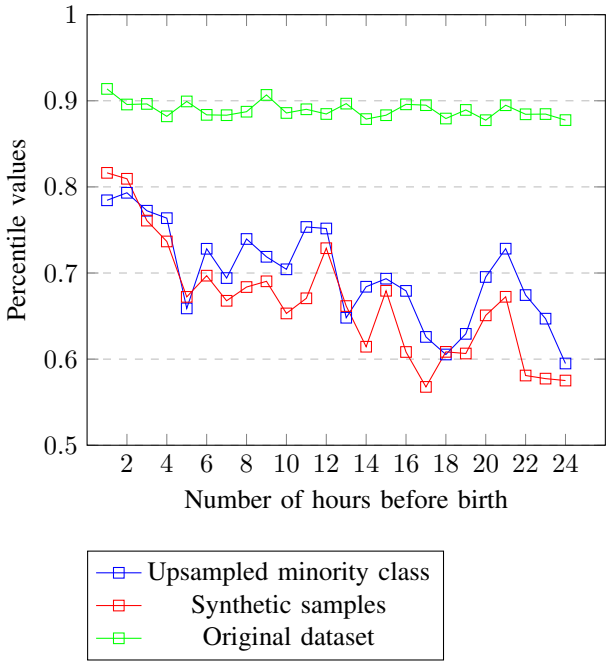

Fig. 21: F1 score of SVM with linear kernel, depending on the number of hours included in the analysis

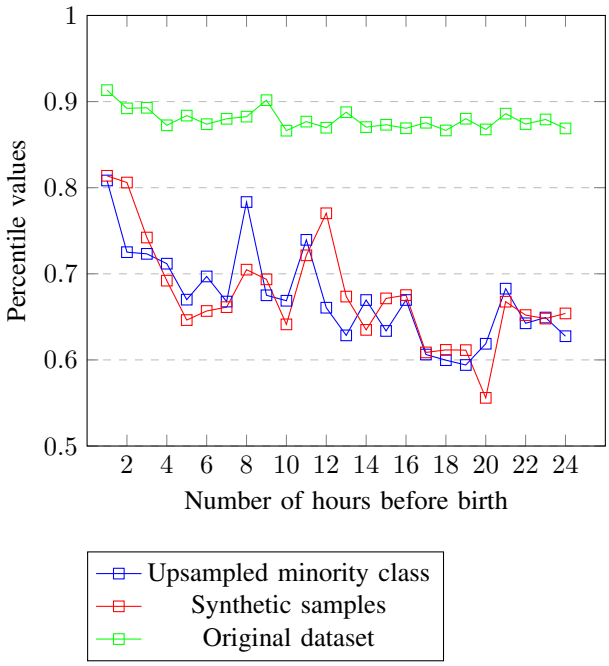

Fig. 22: F1 score of SVM with sigmoid kernel, depending on the number of hours included in the analysis

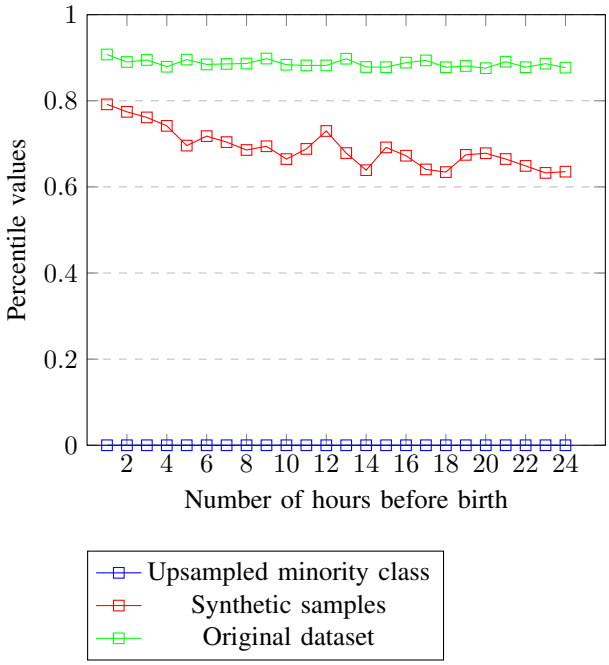

Fig. 23: F1 score of logistic regresson, depending on the number of hours included in the analysis

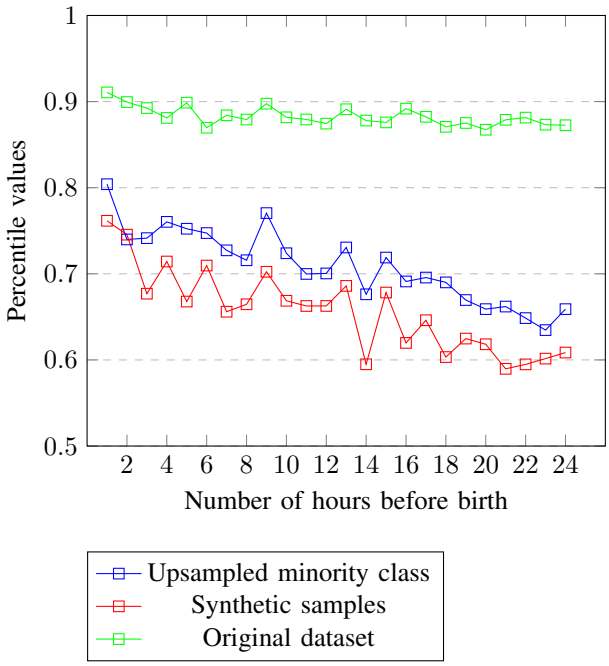

Fig. 24: F1 score of KNN, depending on the number of hours included in the analysis

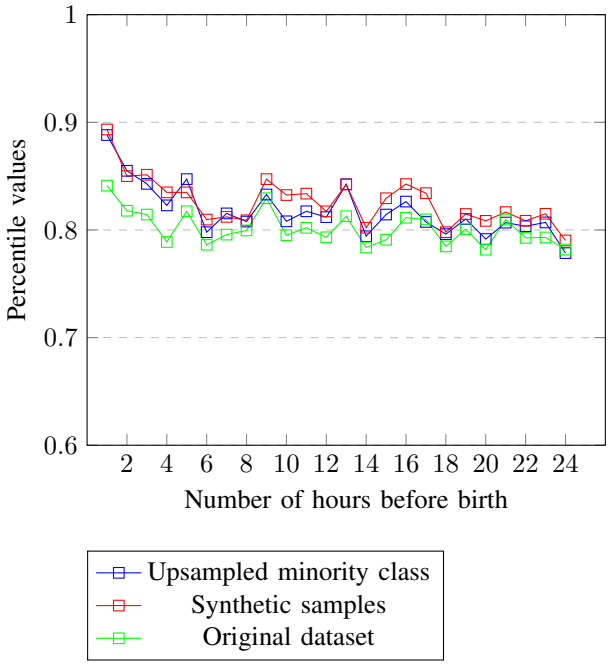

Fig. 25: Precision of random forest method, depending on the number of hours included in the analysis

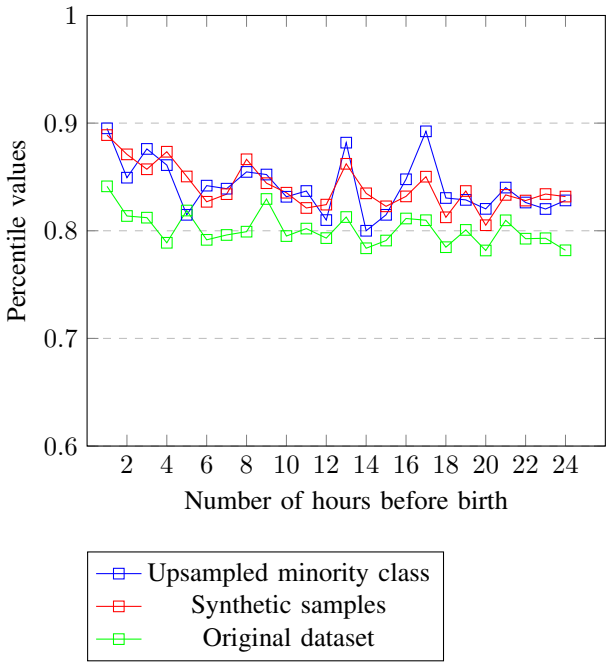

Fig. 26: Precision of SVM with linear kernel, depending on the number of hours included in the analysis

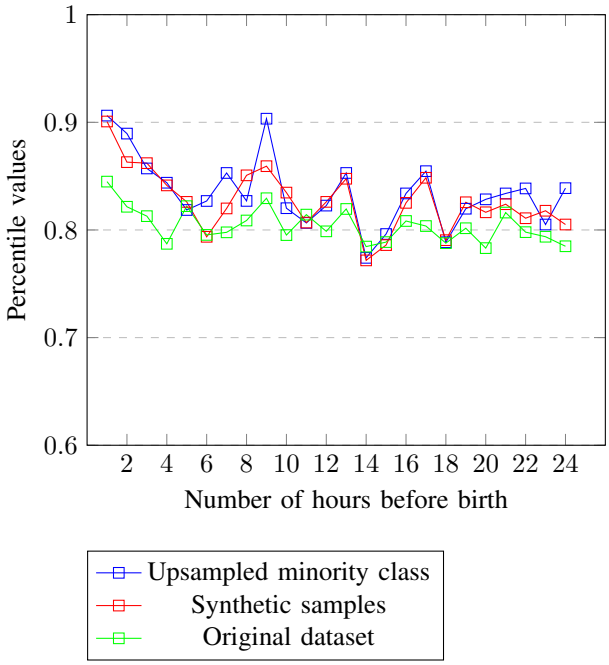

Fig. 27: Precision of SVM with sigmoid kernel, depending on the number of hours included in the analysis

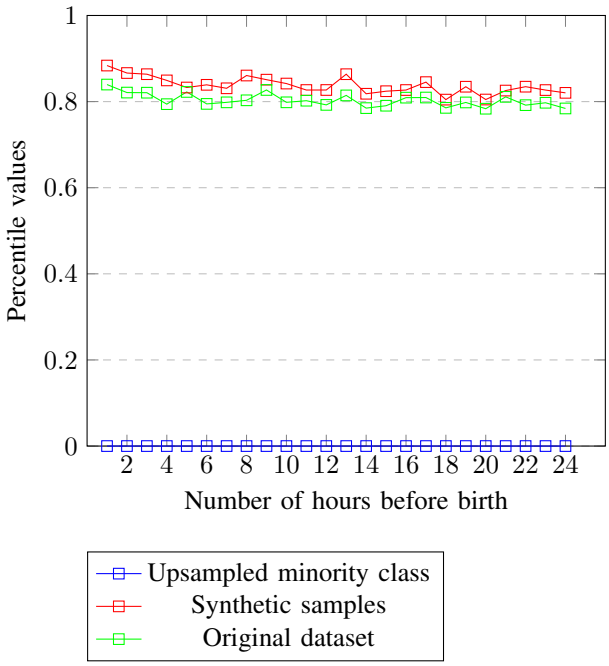

Fig. 28: Precision of logistic regresson, depending on the number of hours included in the analysis

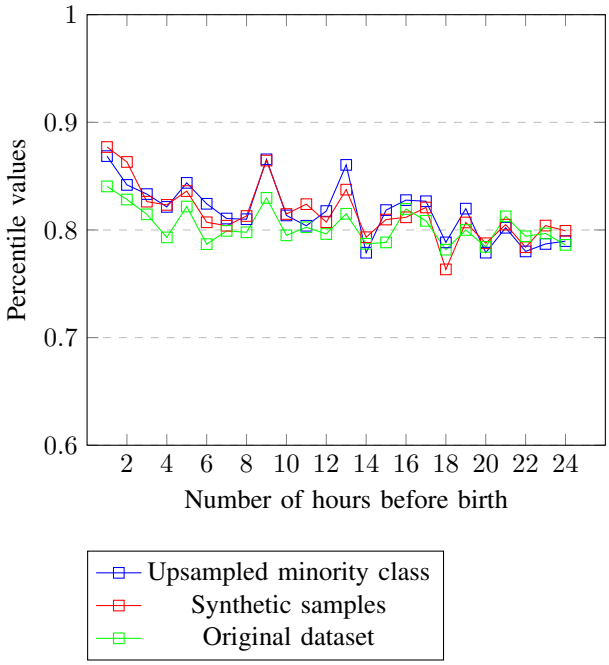

Fig. 29: Precision of KNN method, depending on the number of hours included in the analysis

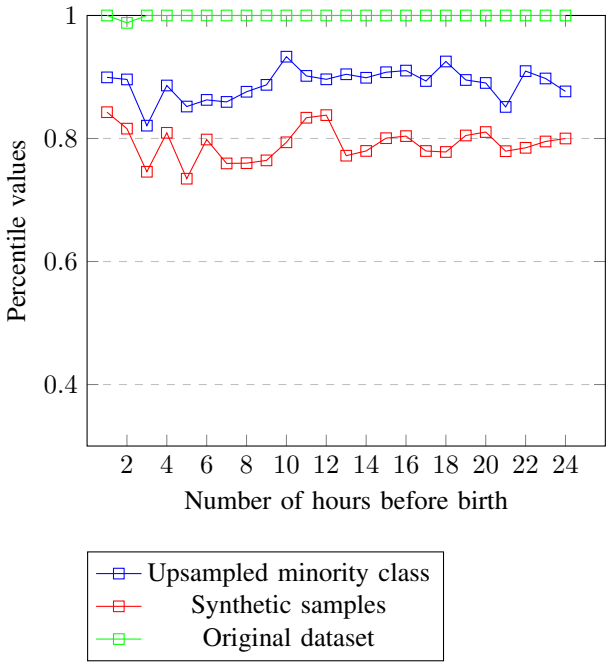

Fig. 30: Recall of random forest method, depending on the number of hours included in the analysis

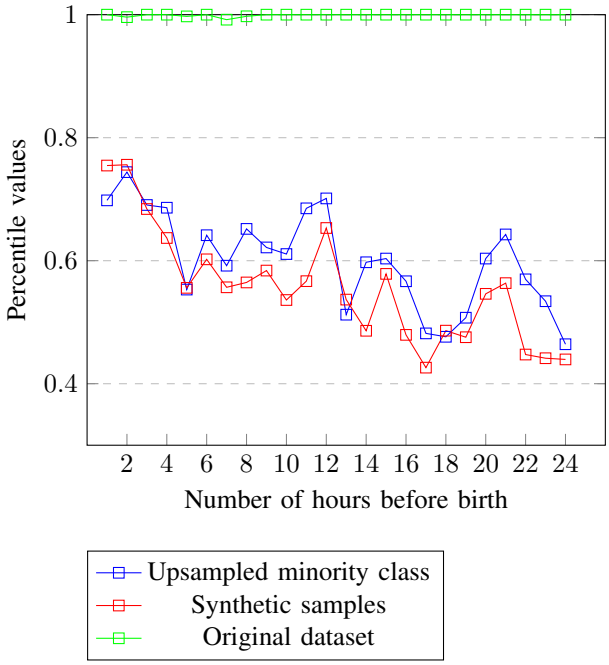

Fig. 31: Recall of SVM with linear kernel, depending on the number of hours included in the analysis

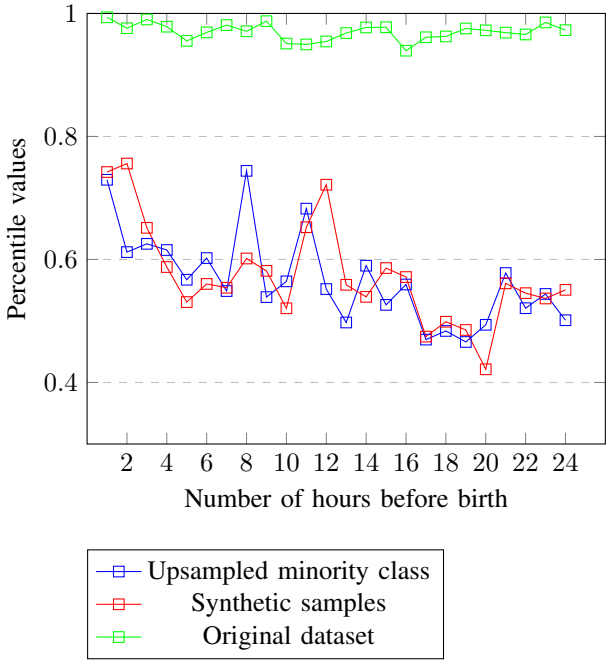

Fig. 32: Recall of SVM with sigmoid kernel, depending on the number of hours included in the analysis

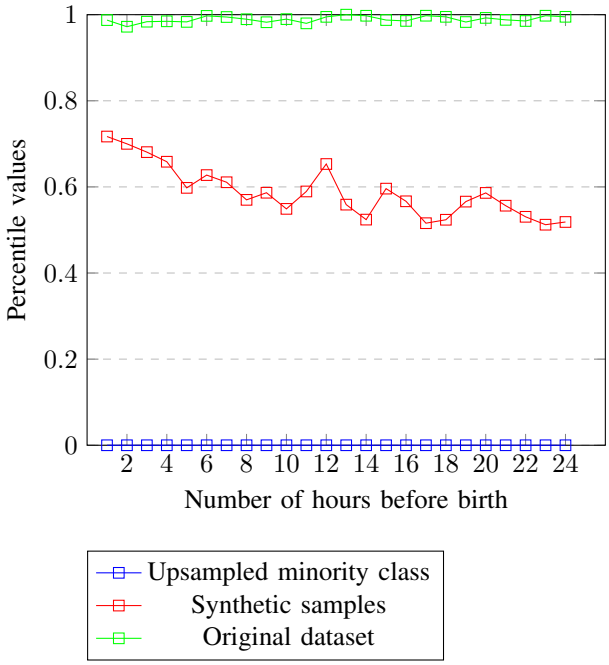

Fig. 33: Recall of logistic regresson, depending on the number of hours included in the analysis

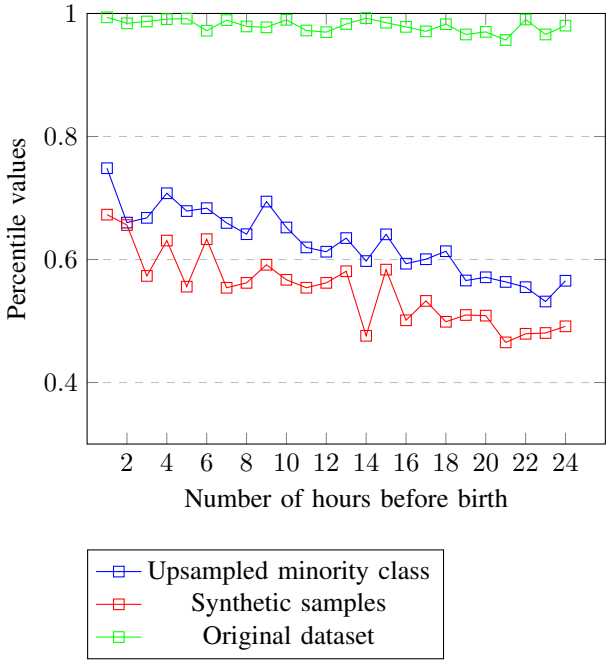

Fig. 34: Recall of KNN method, depending on the number of hours included in the analysis

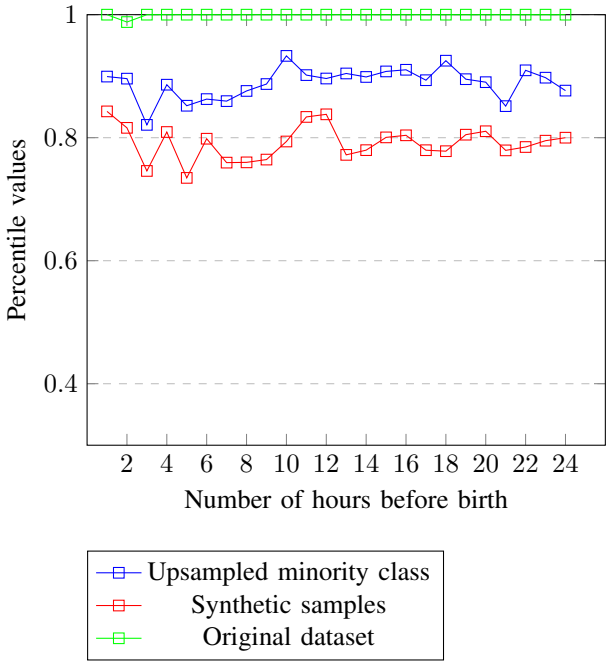

Fig. 35: Sensitivity of random forest method, depending on the number of hours included in the analysis

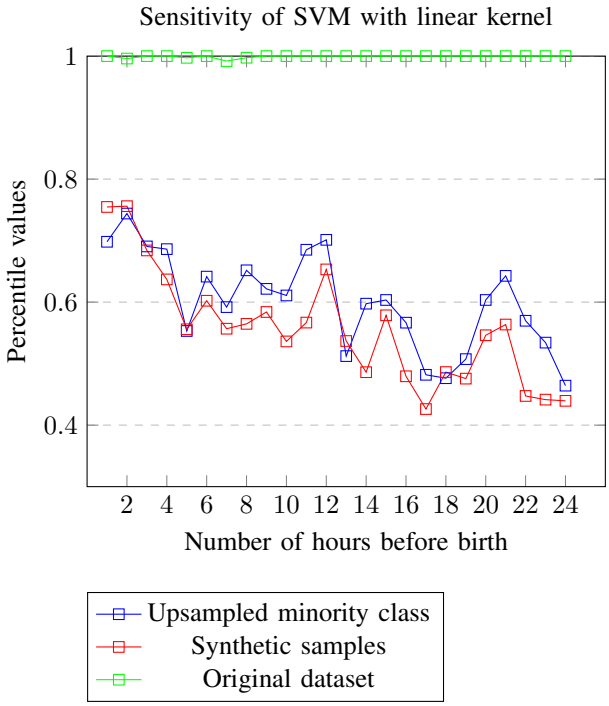

Fig. 36: Sensitivity of SVM with linear kernel, depending on the number of hours included in the analysis

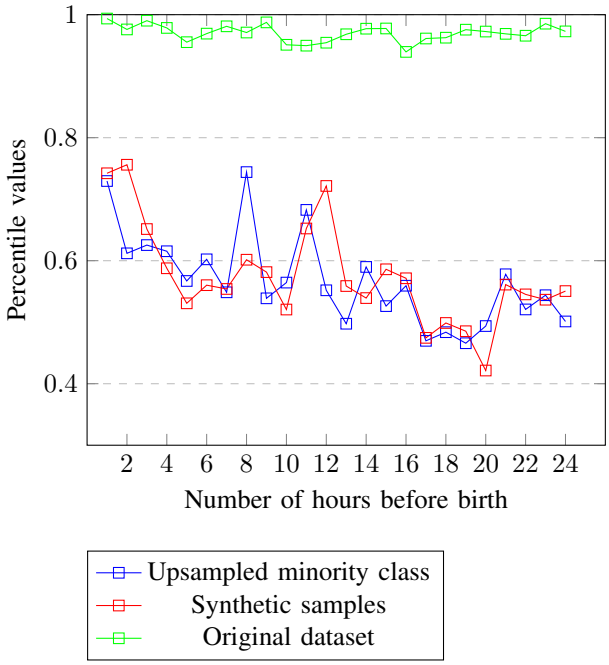

Fig. 37: Sensitivity of SVM with sigmoid kernel, depending on the number of hours included in the analysis

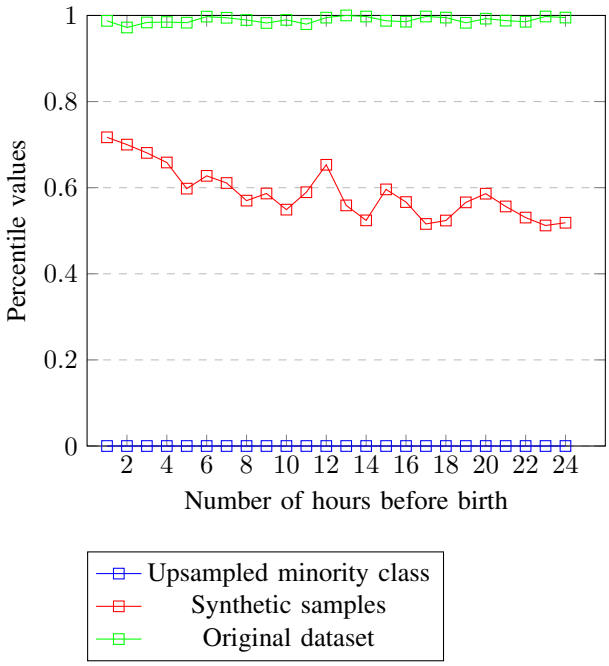

Fig. 38: Sensitivity of logistic regresson, depending on the number of hours included in the analysis

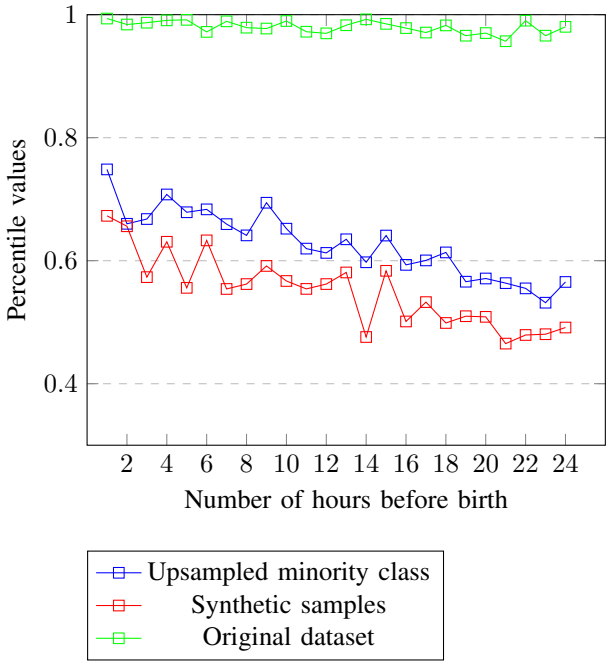

Fig. 39: Sensitivity of KNN, depending on the number of hours included in the analysis

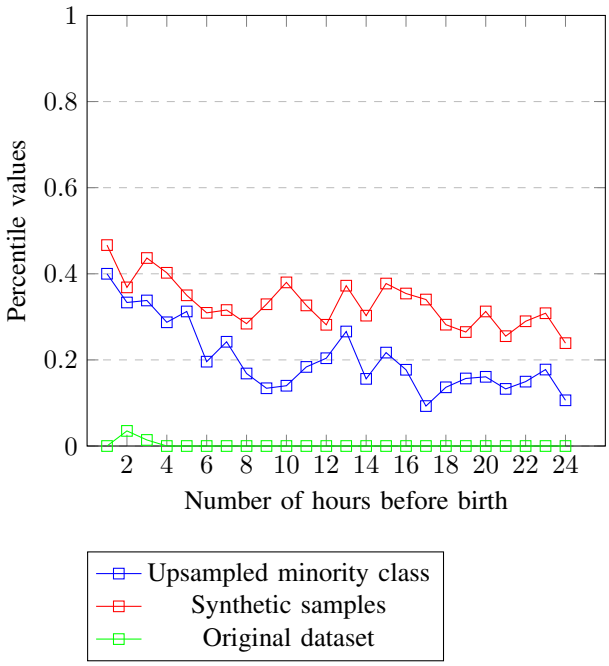

Fig. 40: Specificity of random forest method, depending on the number of hours included in the analysis

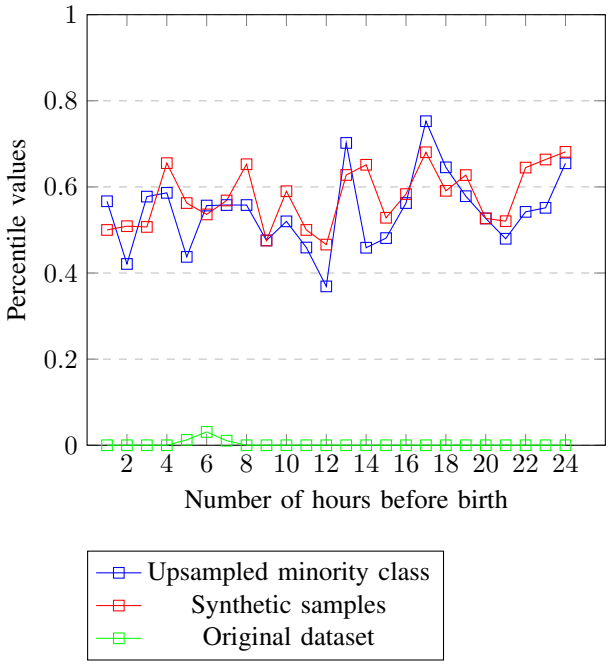

Fig. 41: Specificity of SVM with linear kernel, depending on the number of hours included in the analysis

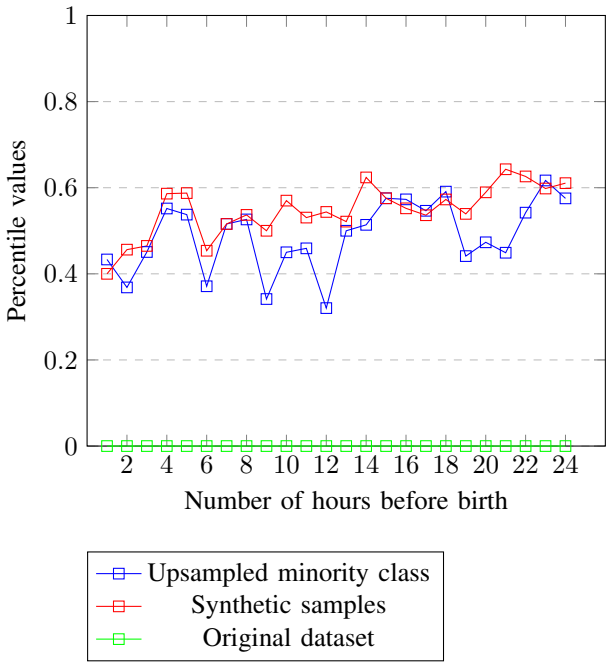

Fig. 42: Specificity of SVM with sigmoid kernel, depending on the number of hours included in the analysis

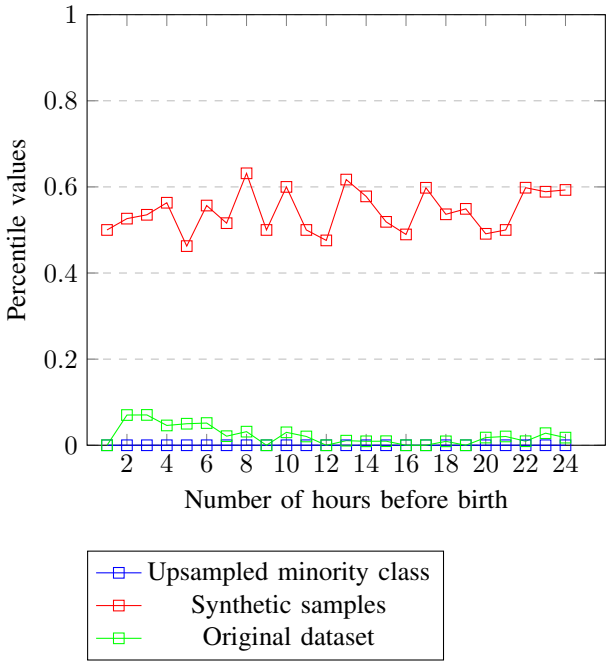

Fig. 43: Specificity of logistic regresson, depending on the number of hours included in the analysis

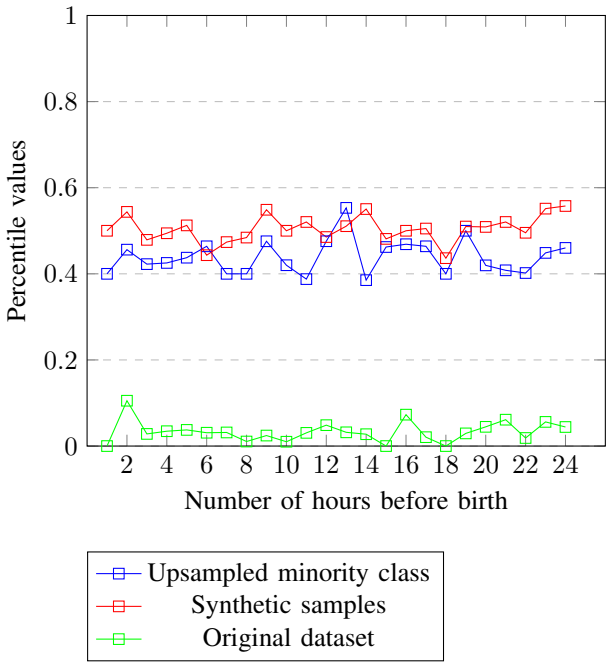

Fig. 44: Specificity of KNN, depending on the number of hours included in the analysis

APPENDIX G
RESULTS OF THE TWO BEST PERFORMING METHODS

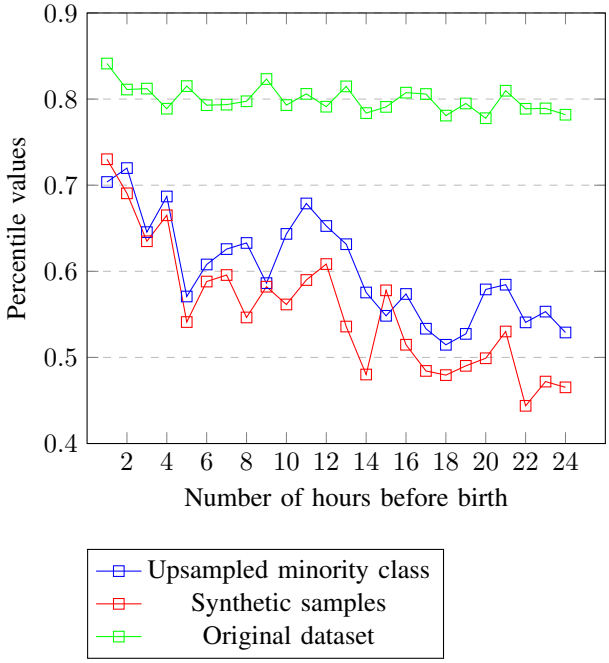

Fig. 45: Accuracy of SVM with polynomial kernel, depending on the number of hours included in the analysis

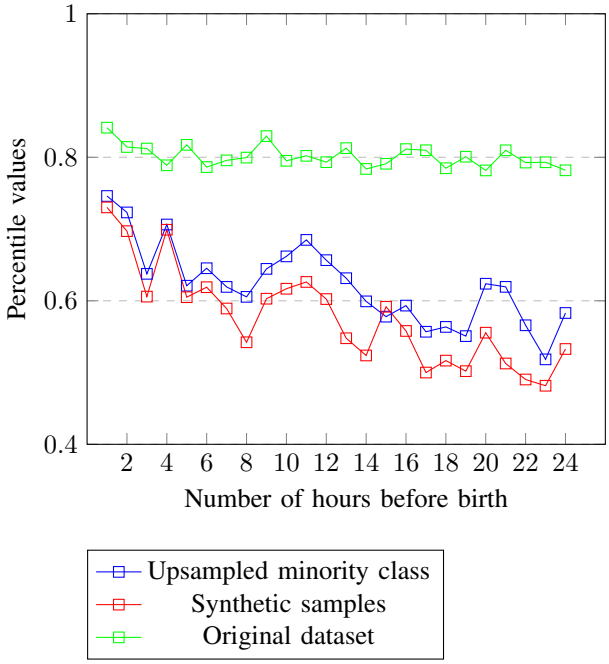

Fig. 46: Accuracy of SVM with RBF kernel, depending on the number of hours included in the analysis

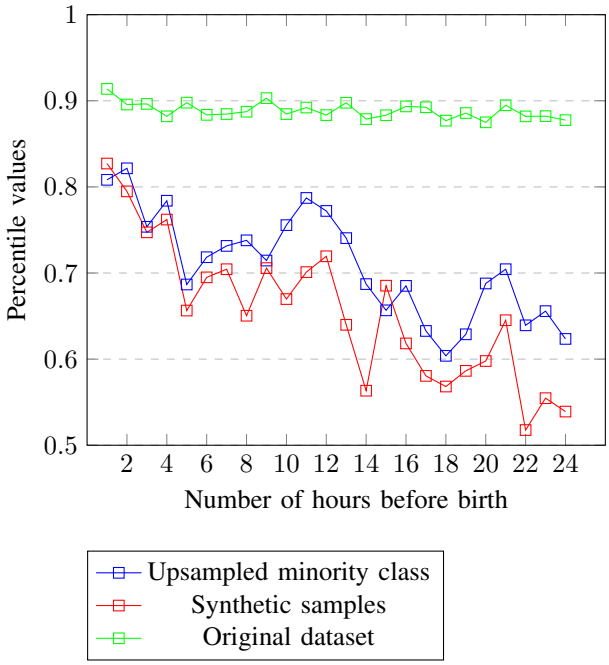

Fig. 47: F1 score of SVM with polynomial kernel, depending on the number of hours included in the analysis

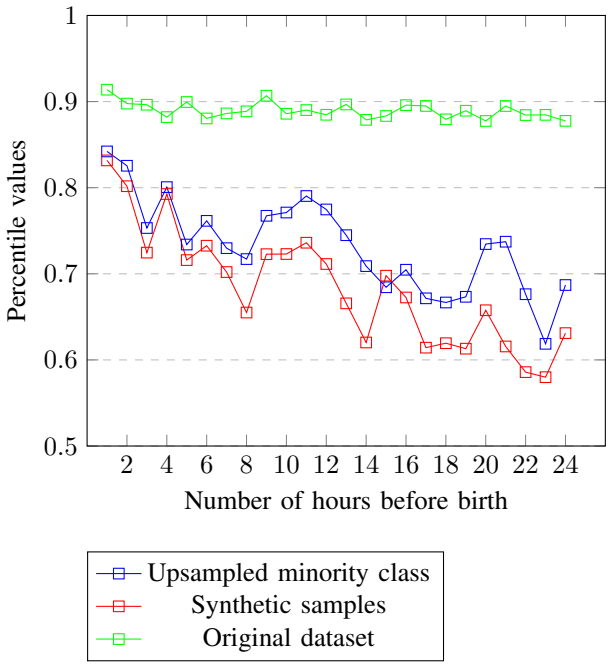

Fig. 48: F1 score of SVM with RBF kernel, depending on the number of hours included in the analysis

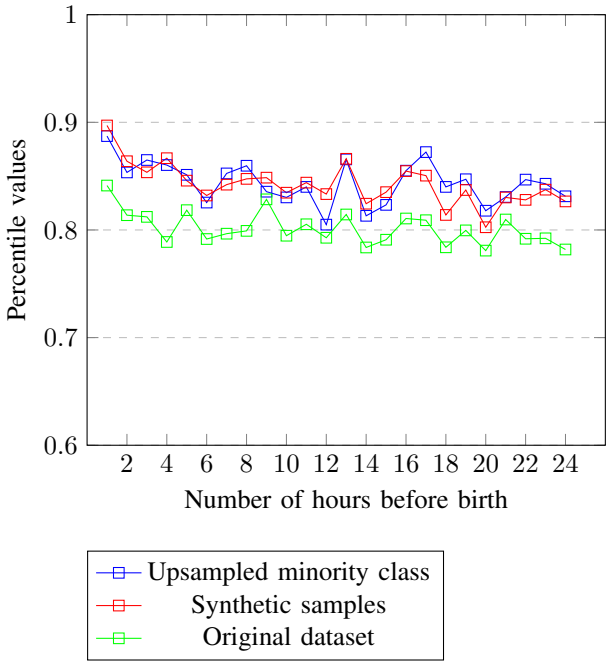

Fig. 49: Precision of SVM with polynomial kernel, depending on the number of hours included in the analysis

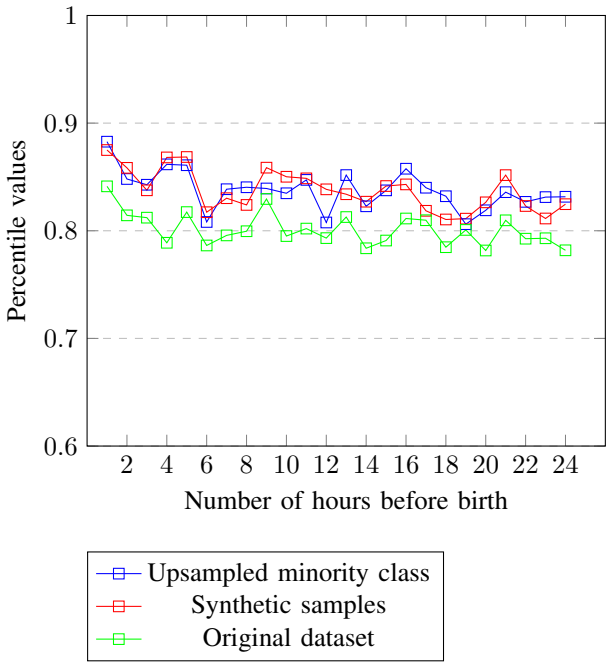

Fig. 50: Precision of SVM with RBF kernel, depending on the number of hours included in the analysis

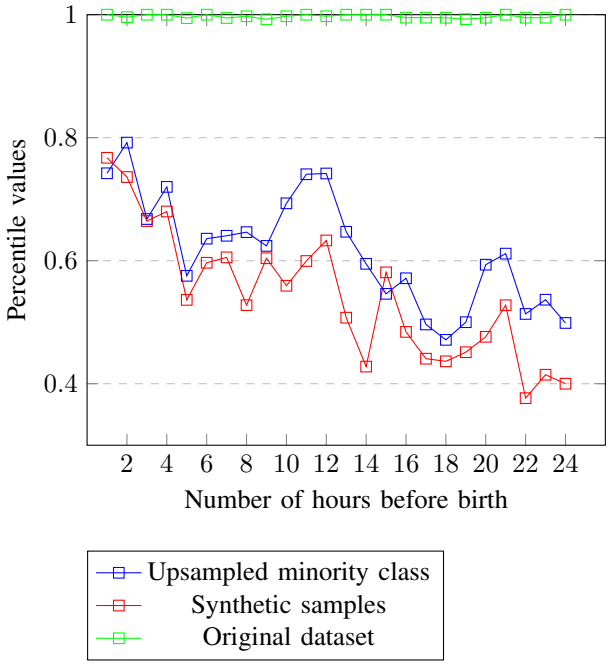

Fig. 51: Recall of SVM with polynomial kernel, depending on the number of hours included in the analysis

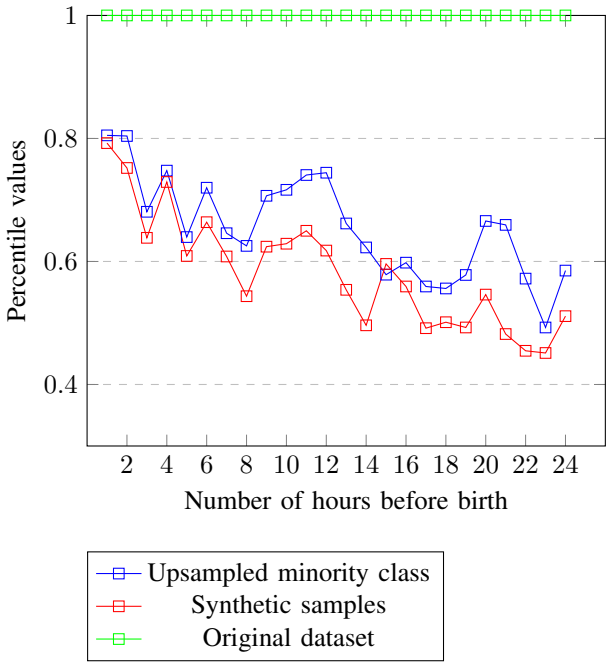

Fig. 52: Recall of SVM with RBF kernel, depending on the number of hours included in the analysis

APPENDIX H
HYPERPARAMETERS USED

Enumeration and values of hyperparameters used in the data processing and evaluation

- Values used for the baseline fetal heart rate:
  - cutoff values for aberrant samples; maximum 200, minimum 100 (based on Warrick et al. [29])
  - subsampling: every 10th data point was used. Based on testing it showed not to compromise accuracy but decrease the computational time around 10 folds
  - filling up gaps in the measurements between 1 and 30 seconds, after experimental testing these gaps were easily filled up and the presumed heart rate fitted in the natural pattern
  - only the first two iterations of the baseline estimation algorithms were used because in the testing this produced sufficiently accurate baseline estimation (shown on figure 3) while cutting down on computational need
  - correction step in the baseline estimation, beyond 10% difference the new estimation was rejected, found after empirical testing
- Uterine activity
  - cutoff values for aberrant samples maximum 40, minimum 5. The sensor calibrates itself to a center value of 20 and the standard deviation from is $\approx$ 10 in the measurements. Therefore values that are larger than 40 or smaller than 5 are the result of measurement error or the patient adjusting the sensor
  - moving average filter is 50 seconds value set after empirical testing
- Partitioning the measurements
  - measurements were considered as separate in analysis if the time difference was greater than 20 minutes (values chosen based on empirical testing and the Erasmus MC protocol for CTG advises a measurement length of 20 minutes)
  - features were calculated at every 4 minutes of the measurement, value decided after empirical testing showing a good accuracy between computational needs and accuracy
- Parameters for the machine learning methods:
  - Logistic regression with liblinear solver, and OVR (One-Vs-Rest) classifier. L1 regularization, maximum number of iterations was limited to 1000
  - Support vector method (SVM);
    - linear kernel, regularization parameter 0.5 and the decision function: OVR
    - second degree polynomial kernel, regularization parameter 0.1 the decision function shape: OVO (One-Vs-One), the kernel function coefficient ($coef0$) = 10
    - RBF kernel where the kernel coefficient (γ) = auto, and the decision function shape = OVO
    - sigmoid kernel, with regularization parameter (C) = 0.5, kernel coefficient (γ) = 1/number of features, and kernel function coefficient ($coef0$) = 0.1
  - Random forest classifier; the number of estimators was set on 1000, the data set split was supported by the Gini impurity criteria, the minimum number of samples required to split an internal node was 10, the minimum number of samples required to be at a leaf node was 10 and the number of features to consider when looking for the best split was the square root of the total number of features
  - K-nearest neighbors classifier; the number of neighbors was 10. The weight points were calculated by the inverse of their distance. The method to compute the nearest neighbors was set to ball tree, where the leaf size passed over was 40. The power parameter for the Minkowski metric was 2

APPENDIX I
FIVE CLASSIFICATION STANDARDS

NICHD 2008	Normal	Suspicious and indeterminate	Pathological
Baseline rate	110-160 bpm	Bradychardia not accompanied by absent baseline variability Tachycardia	Absent baseline FHR variability and any of the following: Recurrent late decelerations; Recurrent variable decelerations; Bradychardia Sinusoidal pattern
Variability	Moderate	-	-
Decelerations	Late or variable decelerations: absent Early decelerations: present or absent	Recurrent variable decelerations accompanied by minimal or moderate baseline changes Prolonged deceleration>2 min but<10 min Repeated late decelerations with moderate baseline variability Variable decelerations with other characteristics, such as slow return to baseline, 'overshoots', or 'shoulders'	-
Accelerations	Present or absent	Absence of induced accelerations after fetal stimulation	-

TABLE CCCXVIII: NCIHD 2008 Fetal heart rate classification system (table adapted from [7])

FIGO 2015	Normal	Suspicious and indeterminate	Pathological
Baseline rate	110-160 bpm	Lacking at least one characteristic of normality, but with no pathological features	<100 bpm
Variability	5-25 bpm	Reduced variability, increased variability, or sinusoidal pattern	
Decelerations	No repetitive	Repetitive late or prolonged decelerations during > 30 min or 20 min if reduced variability, or one prolonged deceleration with>5 min	
Accelerations	-	-	-

TABLE CCCXIX: FIGO classification system (table adapted from [7])

DFHRMT	suspicious or ominous
Baseline rate	marked tachycardia or bradycardia, moderate tachycardia or bradycardia, varying baselines with unclear interpretation
Variability	decreased variability or variability (absent beat-to-beat variation, flat tracing)
Decelerations	late deceleration pattern, moderate and severe variable deceleration patterns and other confusing patterns

TABLE CCCXX: DFHRMT classification system (adapted from [8])

SOGC	Normal	Atypical	Abnormal
Baseline rate	110-160 bpm	100-110 bpm >160 bpm<30 min. Rising baseline	Bradycardia<100 bpm Tachycardia>160 for>30 min. Erratic baseline
Variability	6-25 bpm (moderate) ⩽5 (absent orminimal) for <40 min.	⩽5 (absent or minimal) for 40-80 min.	⩽5 for ⩾ 80 min. ⩾25 bpm>10 min. Sinusoidal
Decelerations	None or occasional variable <30 sec.	Variable decelerations 30-60 sec. Duration	Variable decelerations 60 sec. duration Late deceleration(s)
Accelerations Term Fetus	⩾2 accelerations with acme of⩾15 bpm, lasting 15 sec. < 40 min. of testing	⩽2 accelerations with acme of ⩾ 15 bpm, lasting 15 sec. in 40-80 min.	⩽ 2 accelerations with acme of⩾15 bpm, lasting 15 sec. in>80 min
Preterm Fetus(<32 weeks)	⩾2 accelerations with acme of⩾10 bpm, lasting 10 sec. < 40 min. of t esting	⩽2 accelerations of ⩾ 10 bpm, lasting 10 sec. in 40-80 min.	⩽ 2 accelerations of ⩾ 10 bpm,
lasting 10 sec. in >80 min			

TABLE CCCXXI: SOGC classification system (table adapted from [43])

RCOG	Reassuring	Non-reassuring	Abnormal
Baseline (bpm)	110-160 bpm	100-109 bpm 161-180 bpm	< 100 > 180 Sinusoidal pattern For ⩾ 10 min
Variability (bpm)	⩾5	< 5 for ⩾ 40 but <90 min	<5 for ⩾ 90 min
Deceleration	Non	Early deceleration Variable deceleration Single prolong Deceleration up to 3 min	A typical variable deceleration Late deceleration Single prolong Deceleration greater than 3 minute
Acceleration	Present	The absence of acceleration with an otherwise normal CTG is of uncertain significant	The absence of acceleration with an otherwise normal CTG is of uncertain significant

TABLE CCCXXII: RCOG classification system (table adapted from [44])