

P5

The role of view and daylight on visual perception of people

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Tutors:

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The role of view in hospitals rehabilitation

- $\circ~$ Green view project
- Greenery with daylight aspects
- Help in recovery and reduce hospital times

Erasmus Mc

1111

Biggest roof gardens in the Netherlands on 8 floor height.
3000m2



Demolish part of the hospital, blocking patients outside

view

Research question

Which relevant factors related to the view to the outside and/or to daylight parameters influence the visual perception of people?

Sub questions:

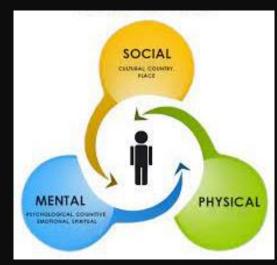
- Is there a difference in pleasantness and or interest between rooms with different orientations?
- Do daylight parameters influence the pleasantness and or interest rating?
- Do view parameters influence the pleasantness and or interest rating?
- Is there an interaction between view and daylight parameters influencing the pleasantness and or interest ratings?

Definition of health: Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.

https://www.publichealth.com.ng/world-healthorganizationwho-definition-of-health/who-definition-ofhealth-2/



https://doyouendo.com/being-a-patient-with-chronic-illness/



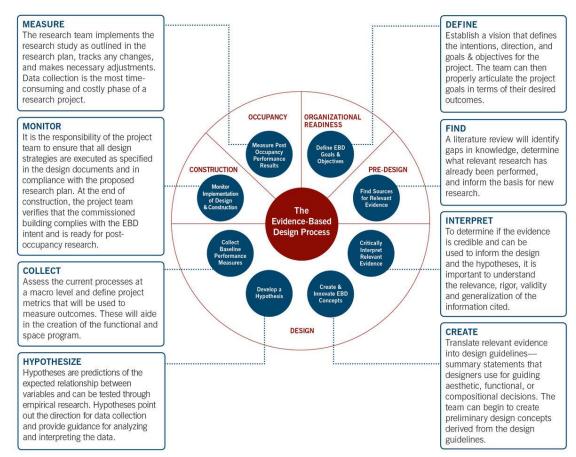
https://steemit.com/health/@jesusherrera/physicalmental-and-social-health

Hospital design

- Often program of requirement in hospital design is outdated.
- Discrepancy between healthcare experts (hospital staff) and the building design team.
- Hospital designs need to improve, parallel to the new acquired healthcare knowledge and patient demand.

Evidence based design

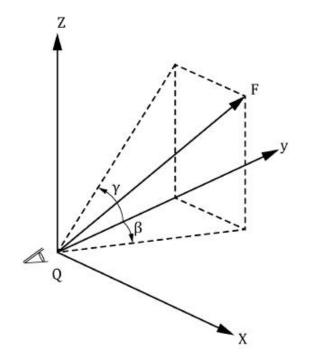
- One factor is isolated from the others and its effects on people's health and mental well-being is tested.
- The Center of Health Design divides EBD into 8 processes



evident based design, 8 design process steps. (Taylor, 2022

NEN-EN 17037

- Assessment view outwards
- Advanced verification method

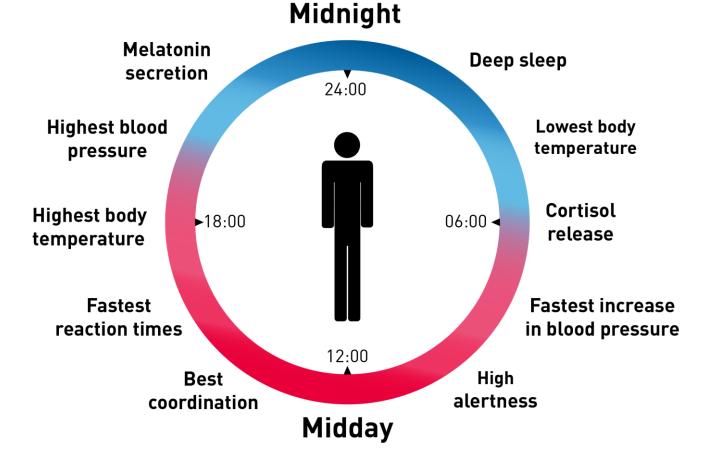


	Parameter ^a					
Level of recommendation for view out	Horizontal sight angle	Outside distance of the view	Number of layers to be seen from at least 75 % of utilized area: - sky - landscape (urban and/or nature) - ground			
Minimum	≥ 14°	≥ 6,0 m	At least landscape layer is included			
Medium	≥ 28°	≥ 20,0 m	Landscape layer and one additional layer is included in the same view opening			
High	≥ 54°	≥ 50,0 m	all layers are included in the same view opening			

The Circadian Rhythm Cycle

Daylight

- People prefer daylight over artificial light.
- Rooms which are lit by natural daylight help keeping the patients on their normal 24-hour sleep-wake cycle.
- Preventing the disruption of patient's circadian rhythm.
- A lot of processes in the human body which involve hormones are influenced strongly by the day and night cycle.
- The produced Cortisol and melatonin have influence on people health, their moods, well-being and performances.



https://atlasbiomed.com/blog/what-is-a-circadian-rhythm/

Window view

- The windows offer a gateway to the world outside, patients can mentally escape the busy or unpleasant room they are confined in.
- Give indication of time
- Information of the outside world
- This positive detracting stimulus can reduce pain perception, blood pressure, pulse frequency, muscle tension, negative emotions, anxiety and stress
- Connection to nature (biophilia), Biophilia makes psychological and physical rejuvenation possible and increases cognitive performances



https://www.dailymail.co.uk/health/article-11323139/Youre-likely-survive-hospital-window-nursing-station.html

Visual perception parameters

View factors

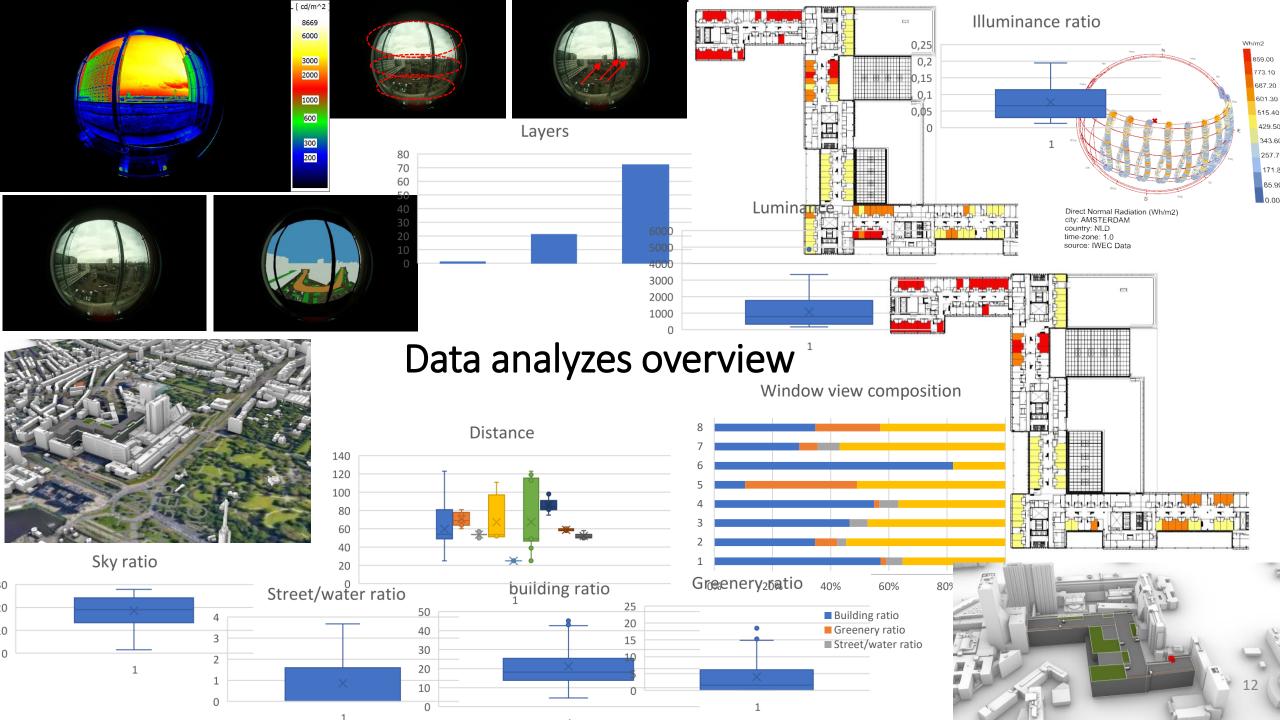
- Layers
- Building ratio
- Greenery ratio
- Street/water ratio
- Sky ratio
- Distance
- Far away elements
- Human activity

Daylight parameters

- Luminance
- Illuminance ratio

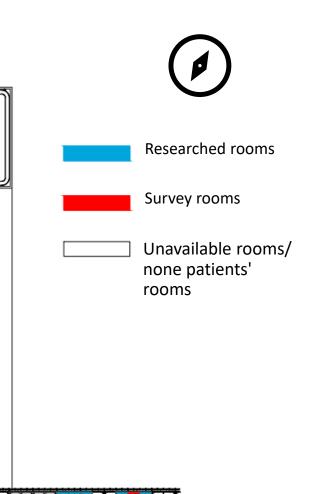
(vertical indoor illuminance / horizontal outdoor illuminance)

- Daylight factor
- Sunlight hours





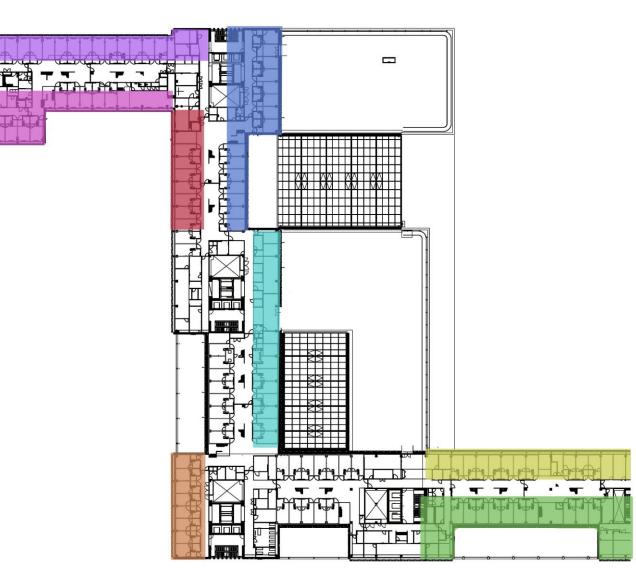
Top view Erasmus mc and surrounding area



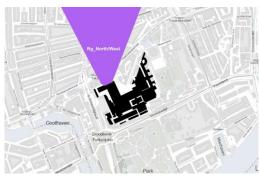
Evaluated hospital rooms

- 83 rooms on 8 floor
- Rooms used in survey are red
- 8 different view directions

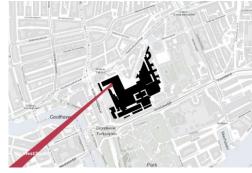
View directions



View directions

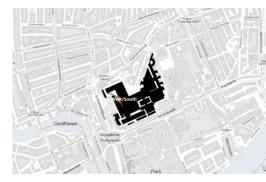


Rg north



Ng west

Ng east



Ne west



Nc north



Rg south



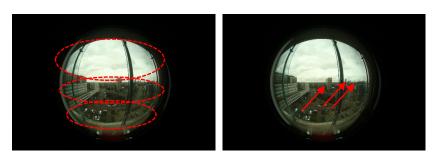


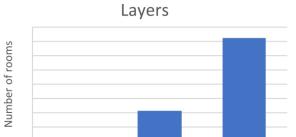




View factors

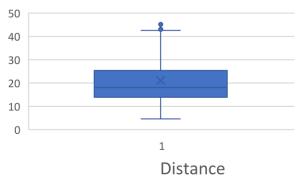
Layers (sky, landscape and ground)

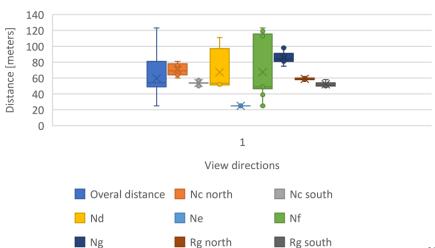




Amount of layers present in the view

building ratio [%]



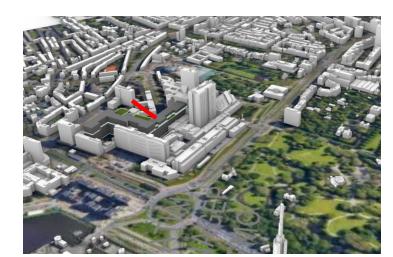


Ratio's:

- Building ratio
- Sky ratio
- Greenery ratio
- Street/water ratio

Distance

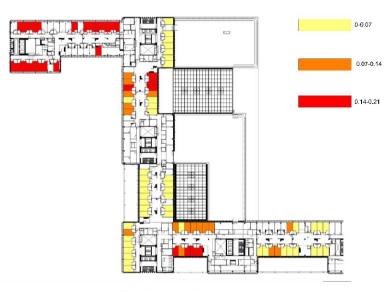


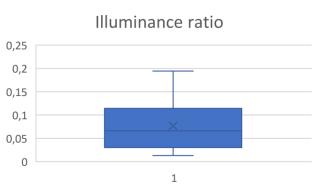


Daylight parameters

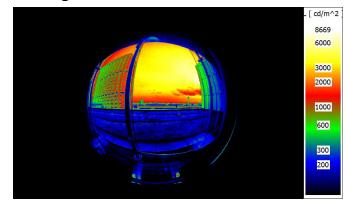
Illuminance ratio





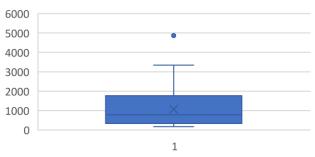


Average luminance





Luminance [cd/m2]



Survey



• Rating on pleasantness

Unpleasant										Pleasant
0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0

Rating on interest

Uniteresting										Interesting
0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0

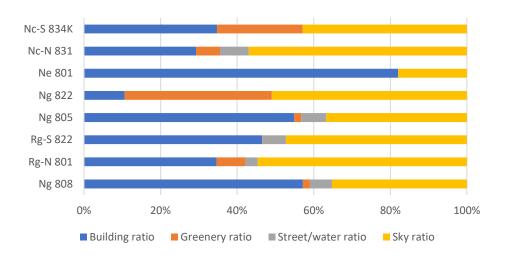
• Pleasantness and interest are considered to be fundamental dimensions in evaluating aesthetics

				Correlations			Correl	tions		
						ratio_illuminan	uliding_ratio Pearson Correlation 1	reenery_ratioratio 52607	sky_ratio layers lu 74637"489"	023 .000
				streets _water		ce veritical/horizon	Sig. (2-tailed) N 85	<,001 .50 85 8	04 <,001 <,001 85 85 85	.837 .999 85 .85
7				building_ratio greenery_ratio _ratio		minance tal	Bootstrap* Bias 0 Std. Emor 0	.002 .00	06001001 35078136	008 .003 .112 .087
e /			building_ratio Pearson Correlatio			061 .075	95% Confidence Interval Lower 1 Upper 1	63522 390 .11	25769743 12476217	241176 .190 .169
6 th 0			Sig. (2-tailed)	<,001 .839 592 592 592	1000	.140 .068	Pearson Correlation - 526 Big. (2-tailed) - 001	1 -320	0 .182 .445 13 .095 <.001	-221 -239 043 028
	\wedge		greenery_ratio Pearson Correlatio		.397" .283"	436"495"	N 85 Bootstrap [®] Blas	85 8 0 .00	85 85 85 11003 .003	85 85 .003 .001
			Sig. (2-tailed)	<,001 <,001	<,001 <,001	<,001 <,001	95% Confidence Interval Lower - 635	142	24029 .356	361394
a scale from ng do you thi iew is?			N	592 592 592		592 592	treets_water_ratio Pearson Correlation .504 Sig. (2-tailed) .504	-320"	1 .498" .392" + 001 .5001	493 ¹⁰ .276 ¹
	× ·		streets _water _ratio Pearson Correlatio			.546 .386	N 85 Bootstrap ⁶ Bias	05 0 .001	15 05 05 0005 .000	85 85 005 004
e 3	7		Sig. (2-tailed)	.839 <,001 592 592 592	<,001 <,001 592 592	<,001 <,001 592 592	515. Error	.056	0 .072 .049 1 .339 .300	.080 .080 .331 .115
ale is:is:	, je ,		sky_ratio Pearson Correlatio		1 .732	.334 .267	Upper .112 Rg_rablo Pearson Correlation	- 208 182 .498	1 .628 .490 1 .582	.844 .447 .399 .305
n a scale ting do yo c view is? c s?			Sig. (2-tailed)	<,001 <,001 <,001		<,001 <,001	Sig. (2-tailed) <,001 N 85	.095 <,00 85 8	01 <,001 85 85 85	<,001 .005 85 85
S B B I			N	592 592 592		592 592	Bootstrap [®] Bias001 Still. Error .078	00300 .093 .07	15 0006 72 0 .078	.009 .001 .091 .097
			Pearson Correlation		.732 1	.422 .186	95% Confidence Interval Lower -769 Upper -476	029 .33 .349 .62	29 1 .413 28 1 .711	.235 .108 .594 .495
on c c c c c c c c c c c c c c c c c c c	om 1-: com 1-:		Sig. (2-tailed)	<,(Confidence Intervals		Confid	ence intervais		
of (<u>و با محمد محمد محمد محمد محمد محمد محمد محم</u>		Iuminance Pearson Correlatio	n(95% Confidence Interv: tailed) ^a			95% Confidence tailed	
ng808 rg801 rg822	ng805 ng822 ne801 nc&1\$nc&3		Sig. (2-tailed)	Pi	earson rrelation Sig. (2-tailed)	Lower Up	Pearson Correlation	Sig. (2-tailed)	Lower	u) Upper
rg808 rg801 rg822			N	5 building_ratio -	714 <,001	751	minance building_ratio52		664	352
<pre>< 1e</pre>	room võõ 🕺 2		ratio_illuminance Pearson Correlatio				greenery_ratio building_ratio - streets07	4 .504	282	.142
Mean of On a scale from the scale fr	On a sc view do		Sig. (2-tailed)	building_ratio - streets	008 .839	089	_water _ratio			
<u> </u>			**. Correlation is significant at the 0.01 level (2-	building ratio also ratio	871 <,001	889	building_ratio - sky_ratio63		748	490
				building_ratio - layers	802 <,001	829	building_ratio - layers48 building_ratio - luminance02		636	308
Correlation	o lea			building_ratio - luminance	061 .140	141	building_ratio00		213	.213
		ng808 rg801 rg822 ng805 ng822 n	e801 nc831 nc834	building_ratio - ratio_illuminance	.075 .068	006	Ratio_illuminance greenery_ratio - streets32	0 .003	499	114
	<u></u> 0 2			veritical/horizontal			".Correlationwater_ratio			
On a scale from 1-10, how Pearson Correlation	.145 2 2	room		greenery_ratio - streets _water _ratio	593 <,001	643	c. Unless ett greenery_ratio - sky_ratio .18 greenery_ratio - layers .44		032	.380
interesting do you think the view io 2 Sig. (2-tailed)	.008			greenery_ratio - sky_ratio	.397 <,001	.326	.442 greenery_ratio - layers .44		414	008
view is? N	337			greenery_ratio - layers	.283 <,001	.206	.355 greenery_ratio23		430	027
Bootstrap ^c Bias				greenery_ratio - luminance	436 <,001	498	368 Ratio_illuminance streets_water_ratio49	8 <,001	.318	.643
	002			greenery_ratio - ratio_illuminance	495 <,001	553	sky_ratio			
Std. En	or .057			veritical/horizontal			streets _water _ratio39	2 <,001	.195	.558
95% C	onfidence Interval Lower .027	- I		streets _water _ratio - sky_ratio	.301 <,001	.226	.373 streets _water _ratio49	3 <,001	.312	.639
	Upper .249	Corrolat	ion onolygo	streets _water _ratio -	.452 <,001	.385	.514 streets _water _ratio27	6 .010	.067	.462
On a scale from 1-10, how Pearson Correlation	.157**	Correlat	ion analyse	layers streets _water _ratio -	.546 <,001	.486	.600 sky_ratio - layers .58	2 <.001	.421	.707
pleasant do you think the				Iuminance	.540 -,001	.400		2 <,001	.421	.564
view is? Sig. (2-tailed)	.004		•	streets_water_ratio -	.386 <,001		Correlations			.486
N	Corre	ions ratio illuminan		ratio_illuminance veritical/horizontal					ratio_illuminan ce	.527
Bootstrap ^c Bias		ce		sky_ratio - layers	.732 <,001				veritical/horizon	.434
Std. En	OF buildi	ratio greenery_ratioratio sky_ratio luminance tal		sky_ratio - luminance sky_ratio -	.334 <,001			luminance	tal	.756
95% C	On a scale from 1-10, how Pearson Correlation	71" .116 .055 .192" .008019	Correlations	ratio_illuminance	.267 <,001		Pearson Correlation Sig. (2-tailed)	061	.075	
	view is? Sig. (2-tailed)	.002 .034 .310 <.001 .883 .734 337 337 337 337 337 337 337		veritical/horizontal			sig. (2-tailed)	592	.008	
	Bootstrap ^c Bias	.002003 .000001 .001 .001		ing_ratio (layers - luminance layers - ratio illuminance	422 < 001	-	Bootstrap ^c Bias	.002	.002	
**. Correlation is significant at the 0.01 level (2-ta	ora. Enor	.056 .054 .053 .053 .059 .056 ale from 1-		171 veritical/horizontal	.100 -,001		Std. Error	.040	.030	
c. Unless otherwise noted, bootstrap results are	95% Confidence Interval Lower	.278 .008051 .083111	Sig. (2-tailed)	.002 luminance - ratio_illuminance	.923 <,001		95% Confidence Interval Lower	134	.016	
	On a scale from 1-10, how Pearson Correlation	70 ^{°°} .102 .074 .194 ^{°°} .030003	N	337 veritical/horizontal			Upper	.024	.137	
	pleasant do you think the view is? SIg. (2-talled)	.002 .062 .176 <,001 .578 .957	Bootstrap ^c Bias	.002 a. Estimation is based on Fisher			Pearson Correlation	436	495	
	N Bootstrap ^e Bias	337 337 337 337 337 337 .003 004 .002 001 .002 .002	Std. Error	.056 .054 .053			Sig. (2-tailed)	<,001	<,001	
	Std. Error	.055 .056 .054 .052 .058 .055	95% Confidence Interval Lower	278 .008051			N Rootetran ^o Riae	001	001	
	95% Confidence Interval Lower	.273011035 .086093113	Upper	062 .218 .163			Bootstrap ^c Bias Std. Error	.001	.001	
	Upper layers Pearson Correlation	.058 .208 .183 .293 .143 .103 ale from 1- 100" .286" .445" .731" .416" .178" it do you th	ink the	170 .102 .074			95% Confidence Interval Lower		533	
	Sig. (2-tailed)	001 <,001 <,001 <,001 .001	Sig. (2-tailed)	.002 .062 .176			Upper	393	459	
	N	337 337 337 337 337 337	N	337 337 337		streets _water _ratio		.546**	.386	
	Bootstrap ^o Bias Std. Error	.001 .000001001001001 .022 .022 .032 .026 .028 .021	Bootstrap ^e Bias	.003004 .002			Sig. (2-tailed)	<,001	<,001	
On a scale from 1-10, how Pearson Correlation	95% Confidence Interval Lower	.838	Std. Error	.055 .056 .054			N	592	592	
pleasant do you think the view is? Sig. (2-tailed)	Upper	.751 .329 .508 .778 .469 .219	95% Confidence Interval Lower	273011035			Bootstrap ^e Bias	.000	.001	
N	**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).		Upper	058 .208 .183			Std. Error	.024	.028	
Bootstrap ^e Blas	c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples		Pearson Correlation	800 .286 .445			95% Confidence Interval Lower Upper	.498	.334	
Std. Error 95% Confidence Interval Lowe	273011 .086035 .118	93113	Sig. (2-tailed)	<,001 <,001 <,001		sky_ratio	Upper Pearson Correlation	.334	.267	
Uppe	058 .208 .293 .183 .330	43 .103	N	337 337 337			Sig. (2-tailed)	<,001	<,001	
On a scale from 1-10, how Pearson Correlation	171 ^{**} .116 [*] .192 ^{**} .055 .215 ^{**}	008019	Bootstrap ⁶ Bias	.001 .000001			N	592	592	
interesting do you think the view is? Sig. (2-tailed)	.002 .034 <,001 .310 <,001	.734	Std. Error	.022 .022 .032			Bootstrap ^o Bias	001	001	
N Bootstrap [°] Bias	337 337 337 337 337 337 .002003001 .000003	337 <u>337</u> 101 .001	95% Confidence Interval Lower	838245380			Std. Error	.031	.029	
Bootstrap Blas Std. Error	.002003001 .000003 .056 .054 .053 .053 .053	050 056	Upper	751 .329 .508	3.778		95% Confidence Interval Lower		.208	
95% Confidence Interval Lowe	278 .008 .083051 .105	11129 * Correlation is	significant at the 0.01 level (2-tailed).				Upper	.392	.324	20
Uppe	062 .218 .293 .163 .314		significant at the 0.05 level (2-tailed). vise noted, bootstrap results are based on 1 000 bootstrap sample	_		-	ificant at the 0.01 level (2-tailed). noted, bootstrap results are based on 1000 boo			20
**. Correlation is significant at the 0.01 level (2-tailed).										

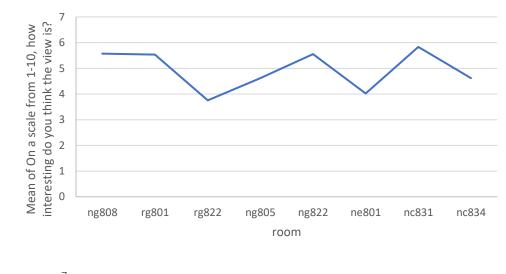
c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

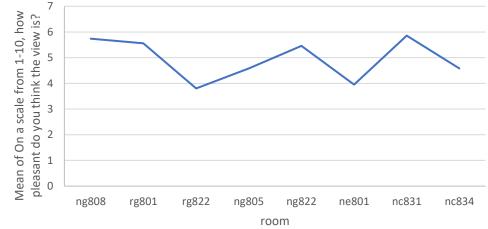
Visual perception rating

- Pleasantness and interest similar evaluations
- The rooms with a lot of building ratio and no greenery were rated the lowest.
- Rooms with the highest score were similar in building ratio, also greenery and street/water were present



Window view composition





Corresponding correlations and differences

- Building , sky and the green ratio have corresponding significant correlations .
- Daylight parameters have very low correlation
- For the layers, the view factors and daylight parameters had significant correlations.

				Correlations					
				building_ratio	greenery_ratio	streets _water _ratio	sky_ratio	luminance	ratio_illuminan ce veritical/horizon tal
On a scale from 1-10, how	Pearson Co	rrelation		171**	.116 [*]	.055	.192**	.008	019
interesting do you think the view is?	Sig. (2-taile	d)		.002	.034	.310	<,001	.883	.734
10413:	N			337	337	337	337	337	337
	Bootstrap ^c	Bias		.002	003	.000	001	.001	.001
		Std. Error		.056	.054	.053	.053	.059	.056
		95% Confidence Interval	Lower	278	.008	051	.083	111	129
			Upper	062	.218	.163	.293	.117	.086
On a scale from 1-10, how	Pearson Correlation			170**	.102	.074	.194**	.030	003
pleasant do you think the view is?	Sig. (2-tailed)			.002	.062	.176	<,001	.578	.957
	Ν			337	337	337	337	337	337
	Bootstrap ^c	Bias		.003	004	.002	001	.002	.002
		Std. Error		.055	.056	.054	.052	.058	.055
		95% Confidence Interval	Lower	273	011	035	.086	093	113
			Upper	058	.208	.183	.293	.143	.103
layers	Pearson Co	rrelation		800**	.286**	.445**	.731**	.416**	.178**
	Sig. (2-taile	d)		<,001	<,001	<,001	<,001	<,001	.001
	N			337	337	337	337	337	337
	Bootstrap ^c	Bias		.001	.000	001	001	001	001
		Std. Error		.022	.022	.032	.026	.028	.021
		95% Confidence Interval	Lower	838	.245	.380	.678	.360	.137
			Upper	751	.329	.508	.778	.469	.219

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlation between view factors and daylight parameters

 Significant correlation between the view factors and the daylight parameters, except for the building ratio.

		Correlations			
				luminance	ratio_illuminan ce veritical/horizon tal
building_ratio	Pearson Co	rrelation		061	.075
	Sig. (2-taile	d)		.140	.068
	N			592	592
	Bootstrap ^c	Bias		.002	.002
		Std. Error		.040	.030
		95% Confidence Interval	Lower	134	.016
			Upper	.024	.137
greenery_ratio	Pearson Co	rrelation		436**	495**
	Sig. (2-taile	d)		<,001	<,001
	Ν			592	592
	Bootstrap ^c	Bias		001	001
		Std. Error		.023	.018
		95% Confidence Interval	Lower	481	533
			Upper	393	459
streets _water _ratio	Pearson Co	rrelation		.546**	.386**
	Sig. (2-taile	d)		<,001	<,001
	N			592	592
	Bootstrap ^c	Bias		.000	.001
		Std. Error		.024	.028
		95% Confidence Interval	Lower	.498	.334
			Upper	.594	.444
sky_ratio	Pearson Co	rrelation		.334**	.267**
	Sig. (2-taile	d)		<,001	<,001
	N			592	592
	Bootstrap ^c	Bias		001	001
		Std. Error		.031	.029
		95% Confidence Interval	Lower	.268	.208
			Upper	.392	.324

**. Correlation is significant at the 0.01 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Confidence intervals comparison

• The confidence intervals of survey rooms are in range of the floor 8 rooms data set

Confidence interval: survey rooms data set

Confidence Intervals 95% Confidence Intervals (2tailed)^a Pearson Upper Correlation Sig. (2-tailed) Lower building_ratio --.714 <.001 -.751 -.672 greenery_ratio building_ratio - streets -.008 .839 -.089 .072 water ration -.871 <.001 -.889 -.849 building_ratio - sky_ratio building ratio - layers -.802 <.001 -.829 -.771 building_ratio - luminance .020 .061 .140 -.141 building_ratio -.075 .068 -.006 .155 ratio_illuminance veritical/horizontal greenery_ratio - streets -.593 <.001 -.643 -.538 _water _ratio .397 <,001 .326 .462 greenery_ratio - sky_ratio greenery ratio - layers .283 <.001 .206 .355 greenery_ratio - luminance -.436 <.001 -.498 -.368 greenery_ratio --.495 <,001 -.553 -.431 ratio_illuminance veritical/horizontal streets _water _ratio -.301 <,001 .226 .373 sky ratio streets _water _ratio .514 .452 <,001 .385 layers streets _water _ratio -.546 <,001 .486 .600 luminance streets water ratio -.386 <,001 .315 .452 ratio_illuminance veritical/horizontal .732 .767 sky ratio-layers <.001 .692 .334 <,001 .404 sky_ratio - luminance .261 sky ratio-.267 <,001 .190 .340 ratio_illuminance veritical/horizontal layers - luminance .422 <,001 .353 .485 layers - ratio_illuminance .186 <,001 .107 .263 veritical/horizontal luminance -.923 <.001 .910 .934 ratio_illuminance veritical/horizontal

Confidence interval: floor 8 rooms data set

Confidence Intervals

	Connaen	ce miervais		
	Pearson		95% Confidence tailed)	
	Correlation	Sig. (2-tailed)	Lower	Upper
building_ratio - greenery_ratio	526	<,001	664	352
building_ratio - streets _water _ratio	074	.504	282	.142
building_ratio - sky_ratio	637	<,001	748	490
building_ratio - layers	489	<,001	636	308
building_ratio - luminance	023	.837	235	.191
building_ratio - Ratio_illuminance	.000	.999	213	.213
greenery_ratio - streets _water _ratio	320	.003	499	114
greenery_ratio - sky_ratio	.182	.095	032	.380
greenery_ratio - layers	.445	<,001	.256	.601
greenery_ratio - luminance	221	.043	414	008
greenery_ratio - Ratio_illuminance	239	.028	430	027
streets _water _ratio - sky_ratio	.498	<,001	.318	.643
streets _water _ratio - layers	.392	<,001	.195	.558
streets _water _ratio - luminance	.493	<,001	.312	.639
streets _water _ratio - Ratio_illuminance	.276	.010	.067	.462
sky_ratio - layers	.582	<,001	.421	.707
sky_ratio - luminance	.399	<,001	.203	.564
sky_ratio - Ratio_illuminance	.305	.005	.098	.486
layers - luminance	.354	<,001	.152	.527
layers - Ratio_illuminance	.243	.025	.032	.434
luminance - Ratio_illuminance	.647	<,001	.503	.756

a. Estimation is based on Fisher's r-to-z transformation with bias adjustment.

a. Estimation is based on Fisher's r-to-z transformation.

Correlation visual perception and layers

• Significant correlation between visual perception and layers

Correlations

				layers
On a scale from 1-10, how	Pearson Co	rrelation		.145**
interesting do you think the view is?	Sig. (2-tailed)		.008	
10110:	N			337
	Bootstrap ^c	Bias		002
		Std. Error		.057
		95% Confidence Interval	Lower	.027
			Upper	.249
On a scale from 1-10, how	Pearson Co	.157**		
pleasant do you think the view is?	Sig. (2-tailed		.004	
VIGW13:	Ν			337
	Bootstrap ^c	Bias		003
		Std. Error		.055
		95% Confidence Interval	Lower	.042
			Upper	.256

**. Correlation is significant at the 0.01 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Lawa ra

Nen-EN 17037 (current)

• Researched behind the NEN-EN



Hellinga, H., & Hordijk, T. (2014). The D&V analysis method: A method for the analysis of daylight access and view quality. *Building and en Environment*, 101-114.

Nen-EN 17037 (current)



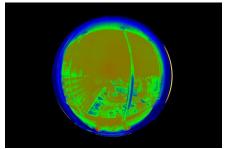
- Lowest value determine level of recommendation
- Area does not have any influence
- One shoe fits all, the influence of building functions are not represented in the matrix

	Parameter ^a				
Level of recommendation for view out	ation Horizontal sight angle Outside distance of the view		Number of layers to be seen from at least 75 % of utilized area: - sky - landscape (urban and/or nature) - ground		
Minimum	≥ 14°	≥ 6,0 m	At least landscape layer is included		
Medium	≥ 28°	≥ 20,0 m	Landscape layer and one additional layer is included in the same view opening		
High	≥ 54°	≥ 50,0 m	all layers are included in the same view opening		

Nen-EN 17037 (proposed)

- Layers are indeed important for the participants perception.
- However, the division could be revisited, the presents of greenery have influence.
- The view elements are influencing each other and participants perception.
- Also, daylight parameters have influence on the view factors, the connection is not included in the current NEN









	Horizontal sight angle	Distance	Building ratio	Sky ratio	Greenery ratio	Street/water ratio
Percentage						
based						
value						
Day light						
parameter						
Impact						
factor						
Location						
factor						
impact						
factor						
Score						
Overall						
score						

Implemented into the hospital design

Readjusting	Readjusting hospital plans: view outward should match the illness severity of the department
Improve	Improve the view outwards, by implementing Green pathways around hospital, green parks
Incorporating	Incorporating :Green renovation in existing hospitals, for example Roof gardens, vertical gardens

Thank you for listening Questions ?

Effect size of significant correlations

Range effect size	Effect size category
0.00 < 0.20	Weak
0.20 < 0.40	Moderate
0.40 < 0.60	Relative strong
0.60 < 0.80	Strong
0.80 < 1.00	Very strong

Incorporating more green



https://slate.com/human-interest/2013/09/patrick-blanc-snewest-vertical-garden-greening-urban-walls-around-theworld.html

https://www.udesign.es/best-biggest-vertical-gardens-world