



Finnish Institute of
Occupational Health

Well-being through work



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Environmental satisfaction among the personnel in Tampere University Hospital – acoustic perspectives

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Full objectives of AKUSAI project

1. How the hospital staff perceive the physical work environment of their unit, especially acoustic environment and speech privacy?
 - Subjective ratings
 - FINISHED
2. Do the subjective ratings depend on the objective ratings of the unit?
 - Objective vs. subjective ratings
 - UNFINISHED

Units differ w.r.t.

- Age of construction
 - 1962-2010
- Type of unit
- Ventilation system
- Room acoustics
- Views outside
- Spatial density
- Etc.

METHODS – Implementation of survey

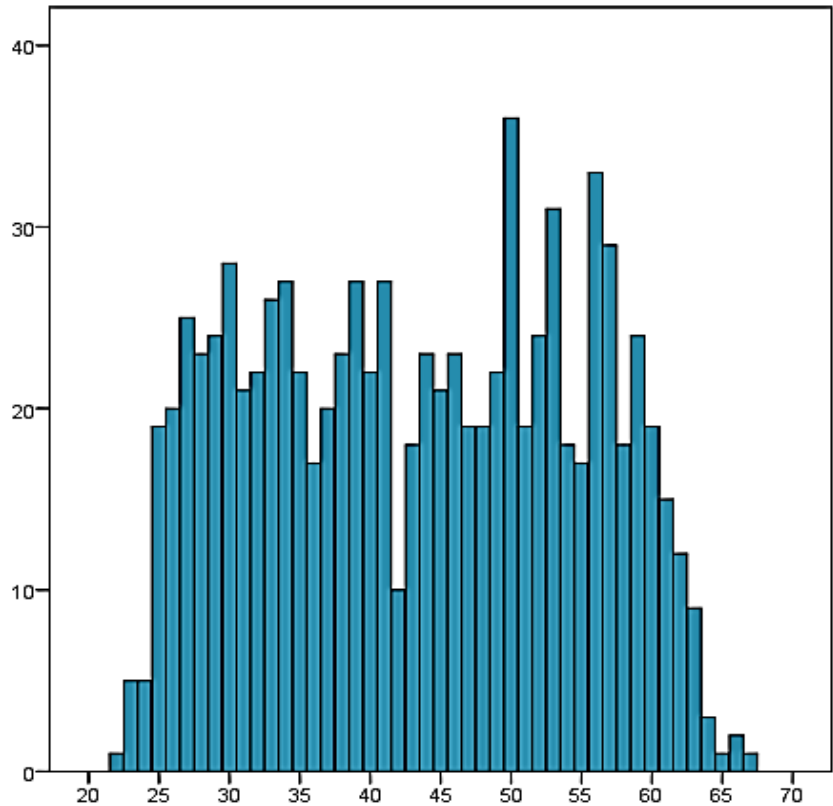
- Ethic board
- Creating the contact to the staff via email
- Preliminary info 30.1.2015
- Link to survey via email and intra
- Survey started 10.2.2015
- Survey closed 26.3.2015

METHODS – Staff and sample

- Personnel in the campus area: 73 work units
- Number of staff receiving the survey 1797 or more
- Number of respondents 885 – Response rate at most 51 %

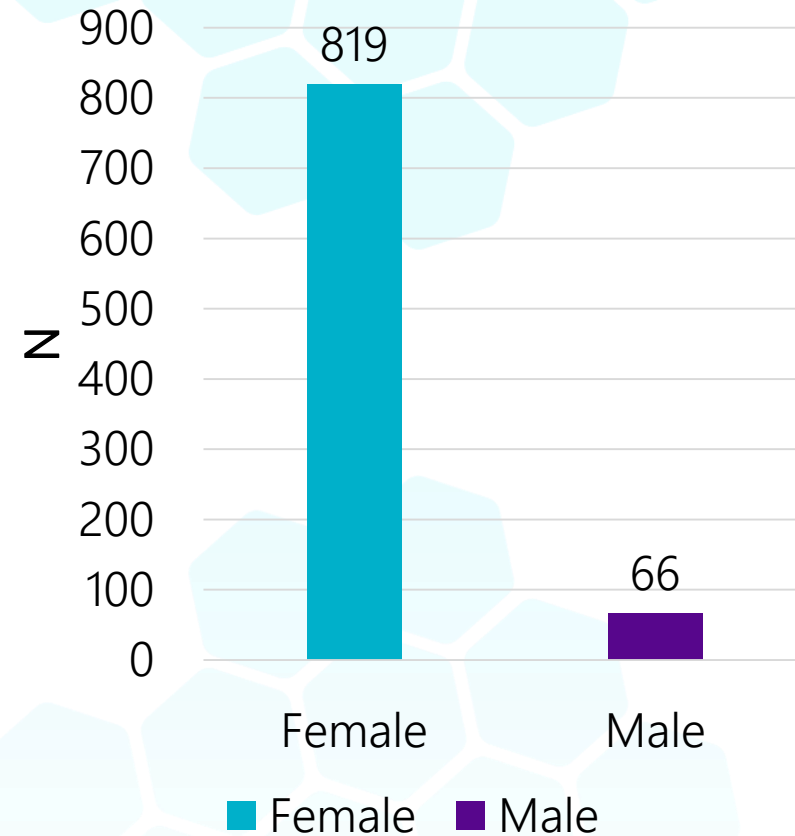


Age

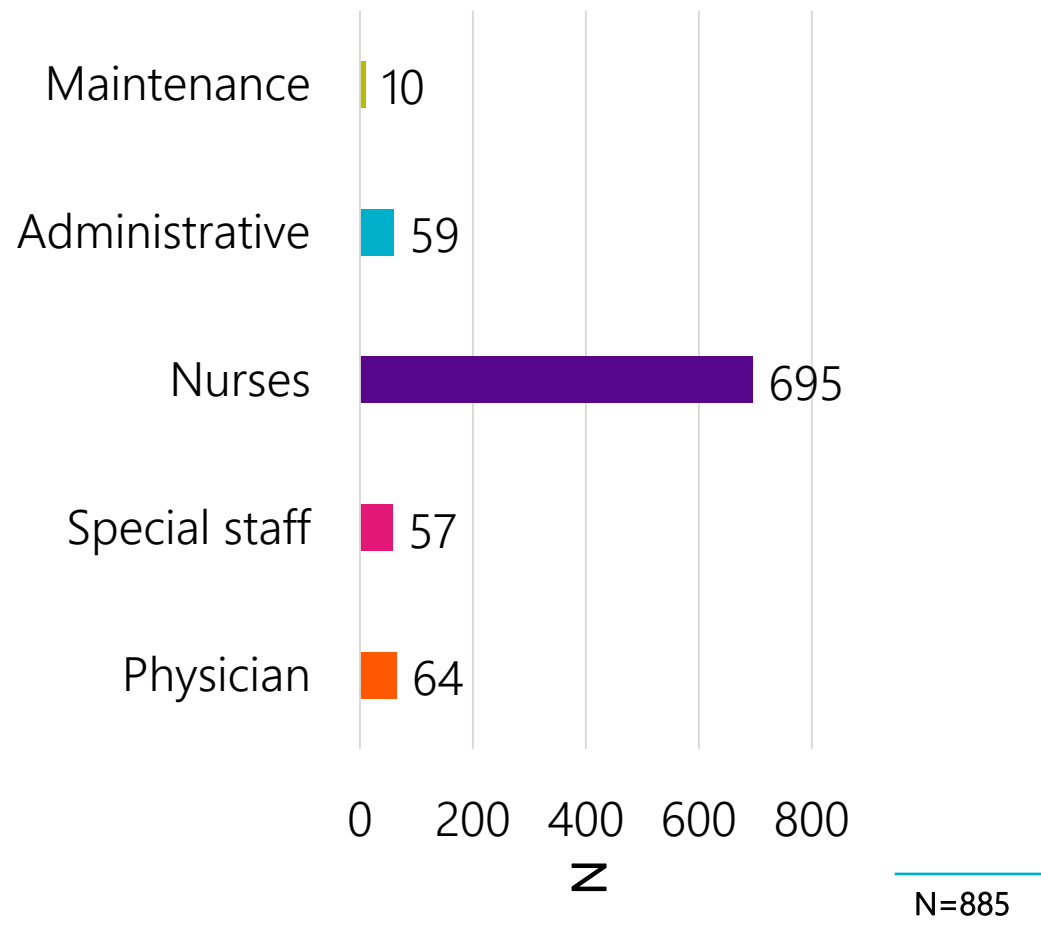


Mean	Sd	N
43	11	870

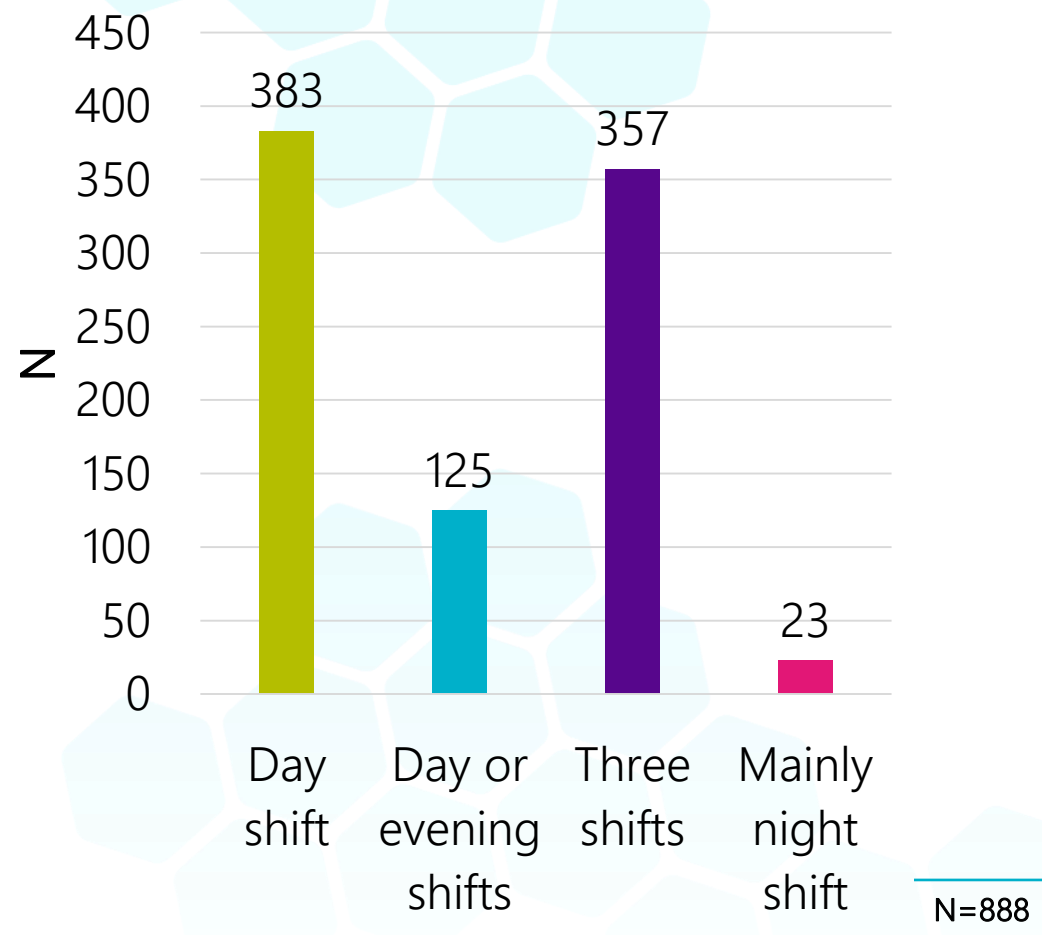
Gender



Education

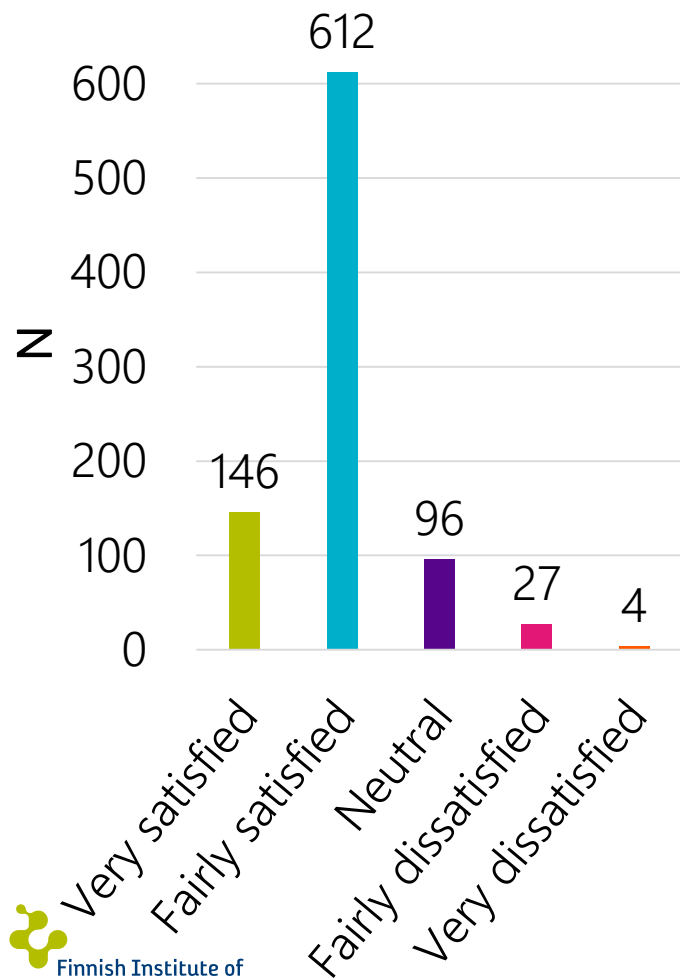


Work shift



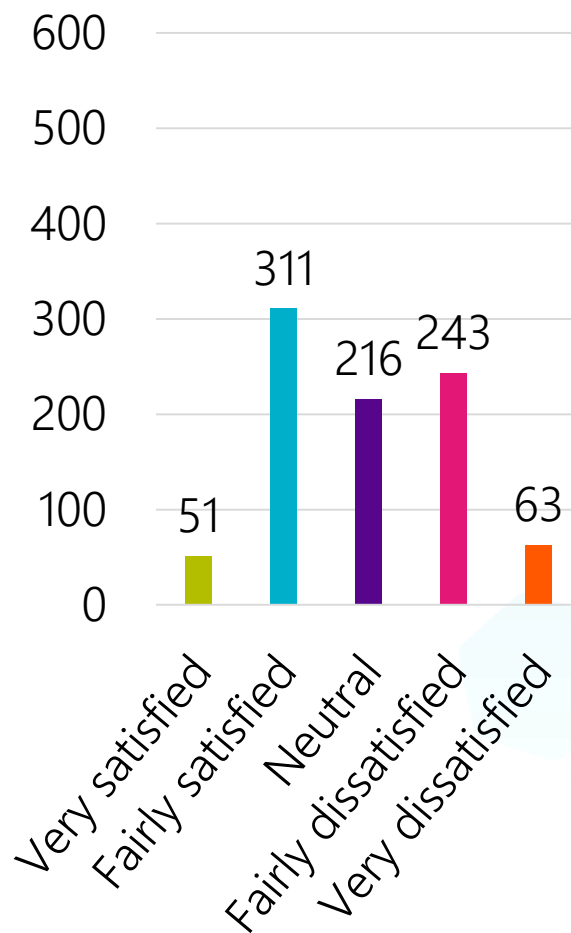
Job Satisfaction

9. How satisfied are you with your work as a whole?



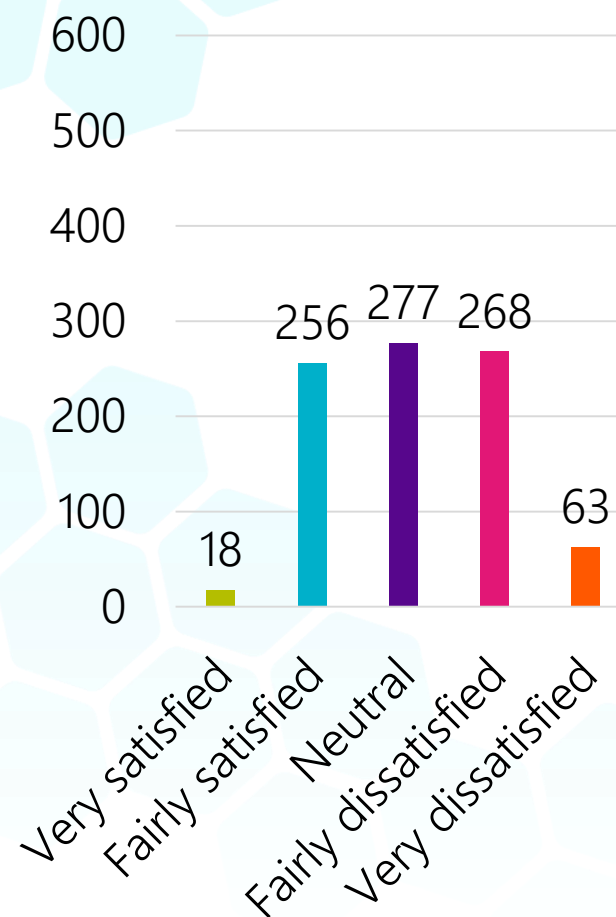
Work Satisfaction

10. How satisfied are you with the work environment of your unit as a whole?



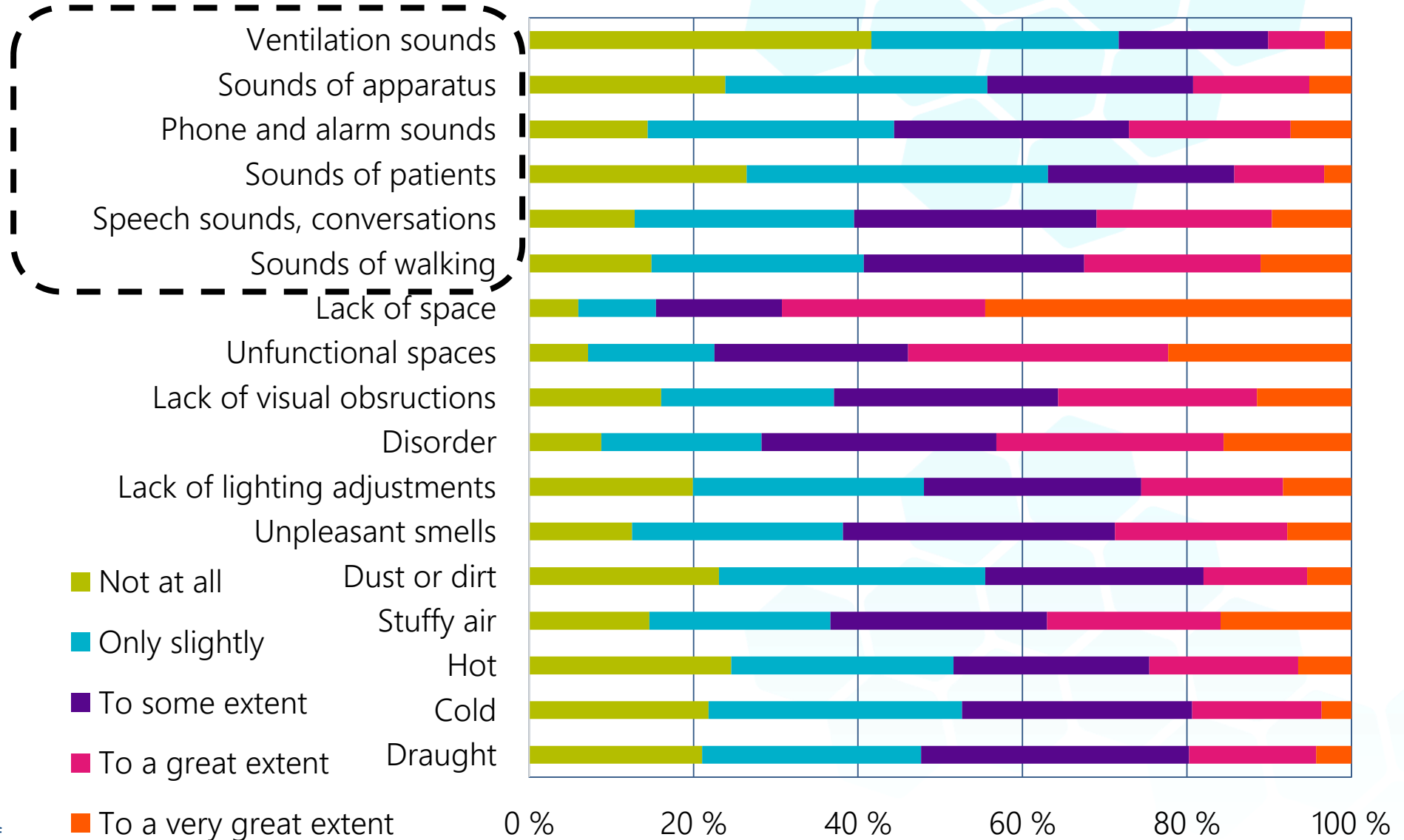
Acoustic Satisfaction

21. How satisfied are you with the acoustic environment of your unit as a whole?



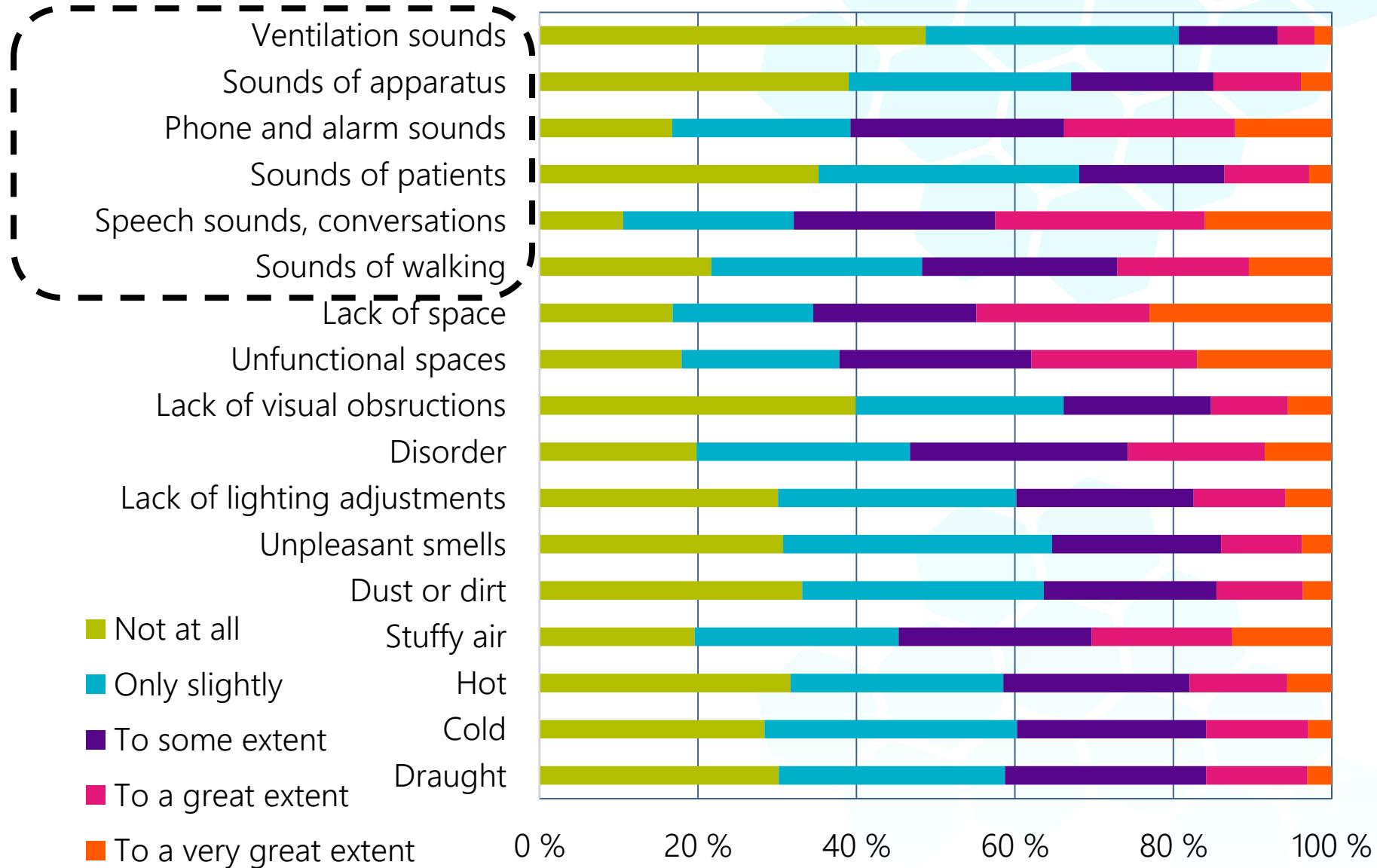
Disturbance of environmental factors during nursing work

11. How much the following factors have disturbed you recently while doing direct nursing work?

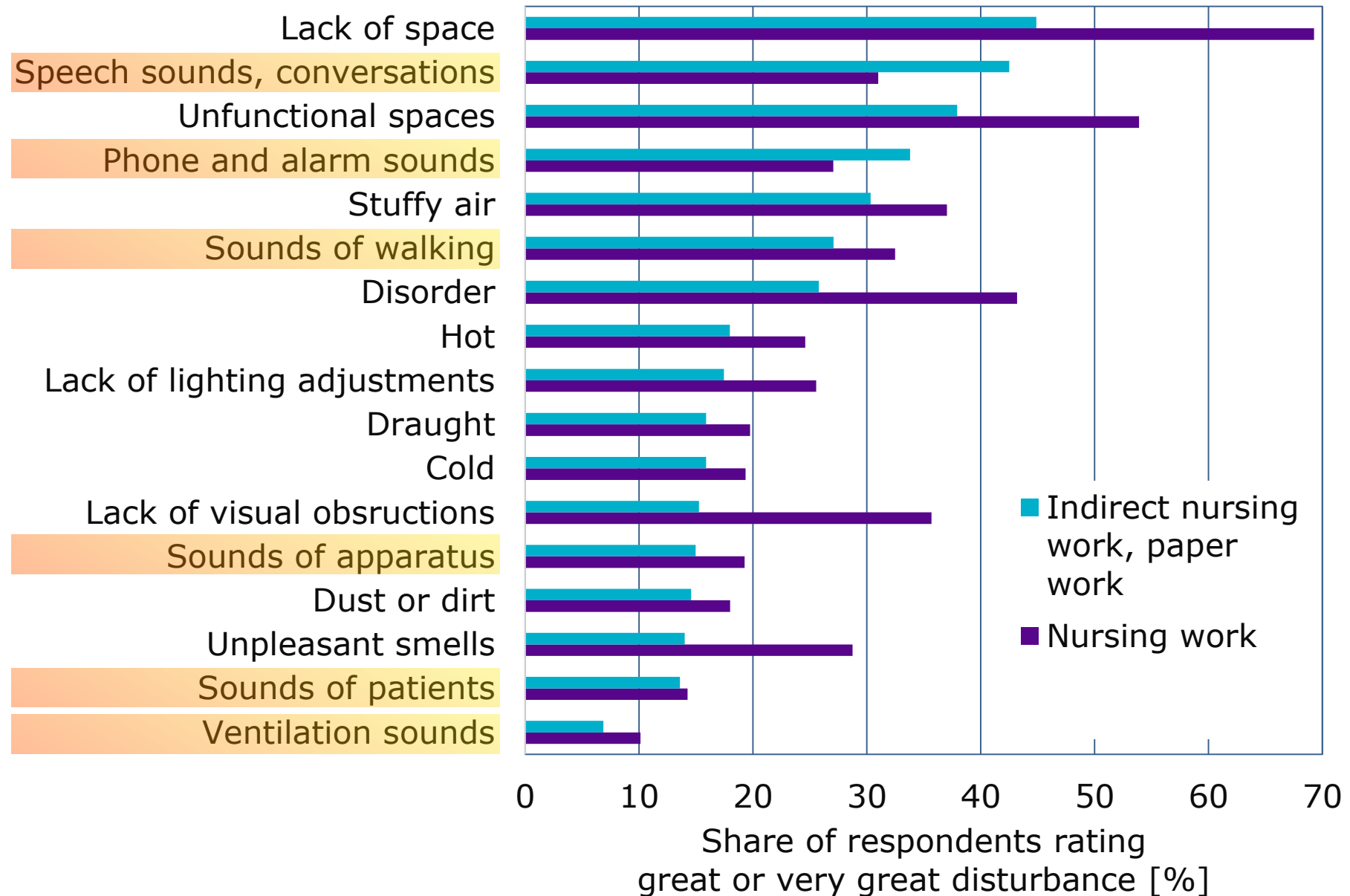


Disturbance of environmental factors during paperwork

11. How much the following factors have disturbed you recently while doing paperwork or indirect nursing work?

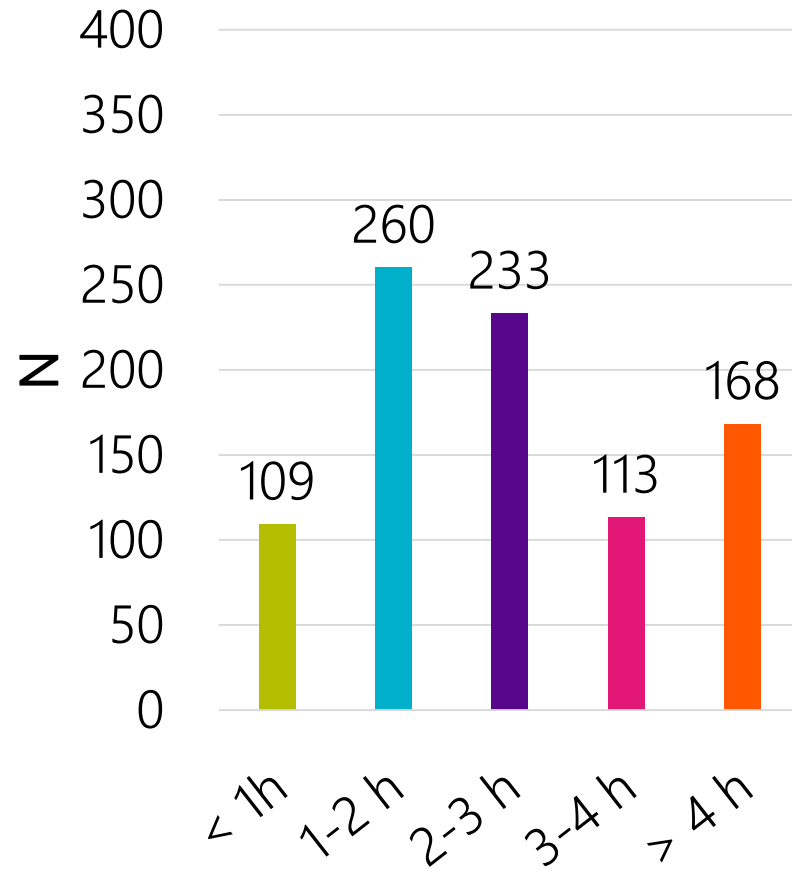


Prevalence of strong disturbance



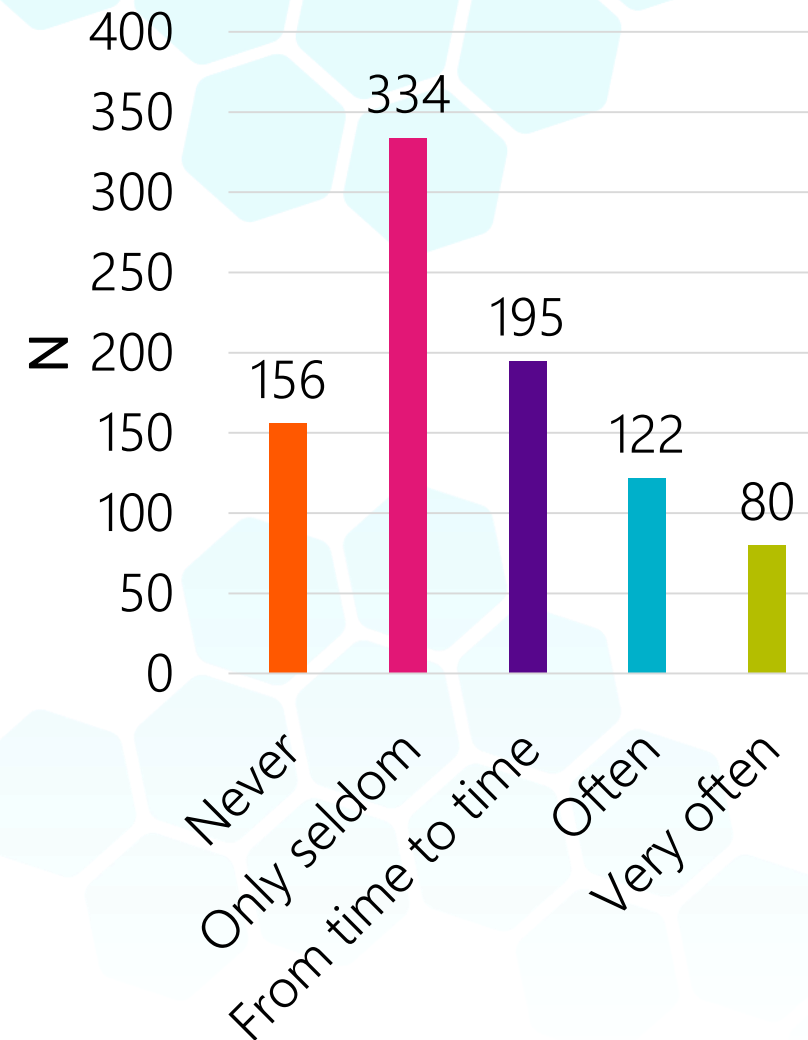
Required daily time/ peace of work

12. How many hours of your work shift requires peace of work (other than direct nursing work)



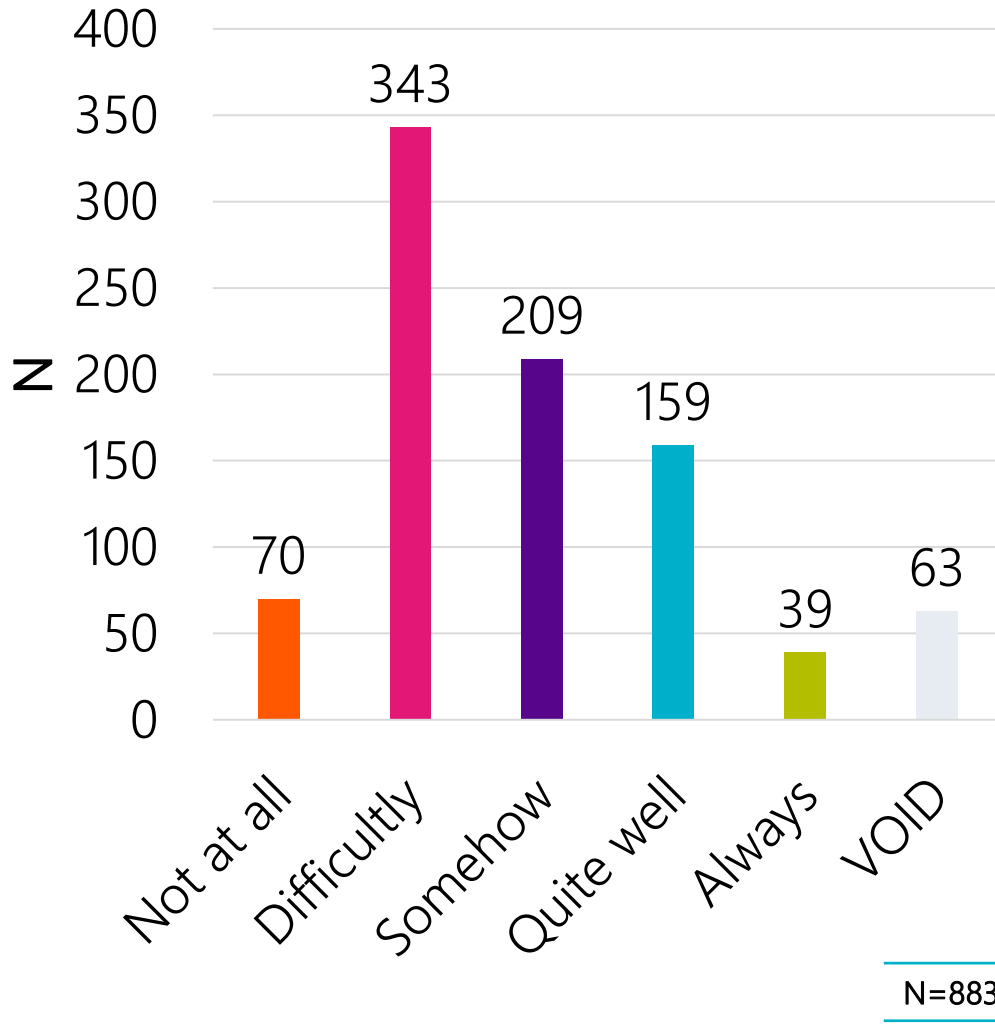
Spaces available/ peace of work

13. Is there a peaceful space available for those work tasks?

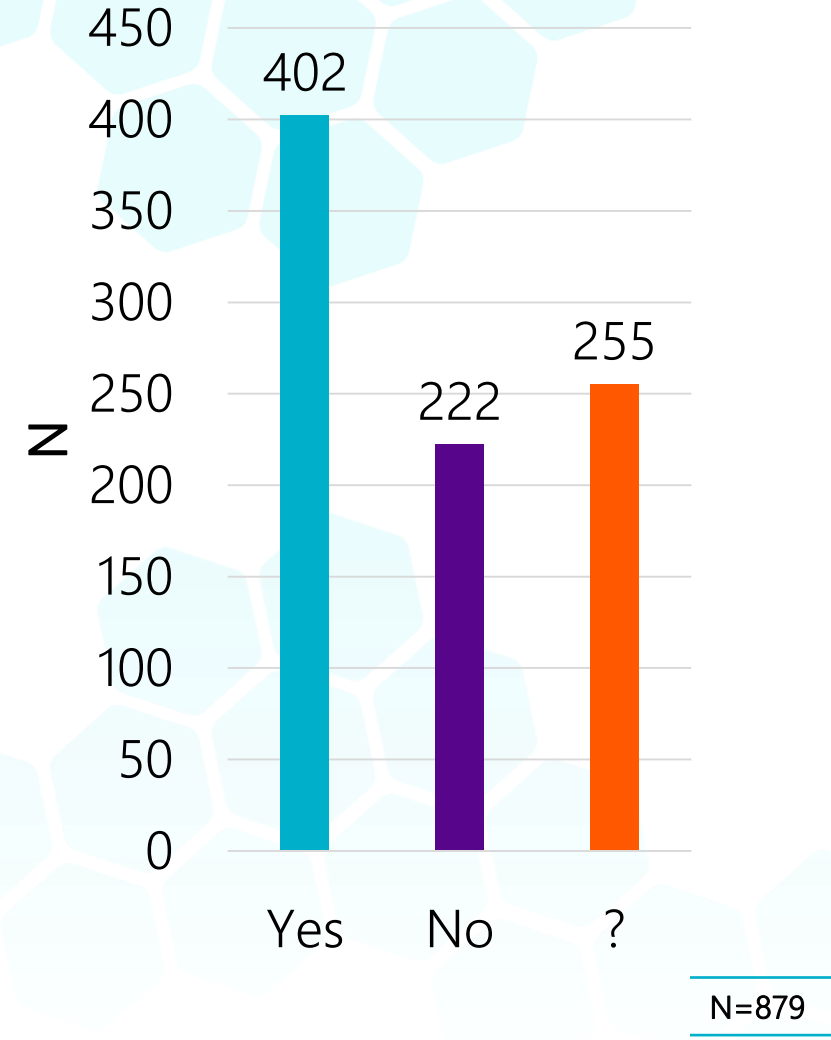


Speech privacy

17. Can you conversate with patients, relatives and other staff so that confidential matters remain private?

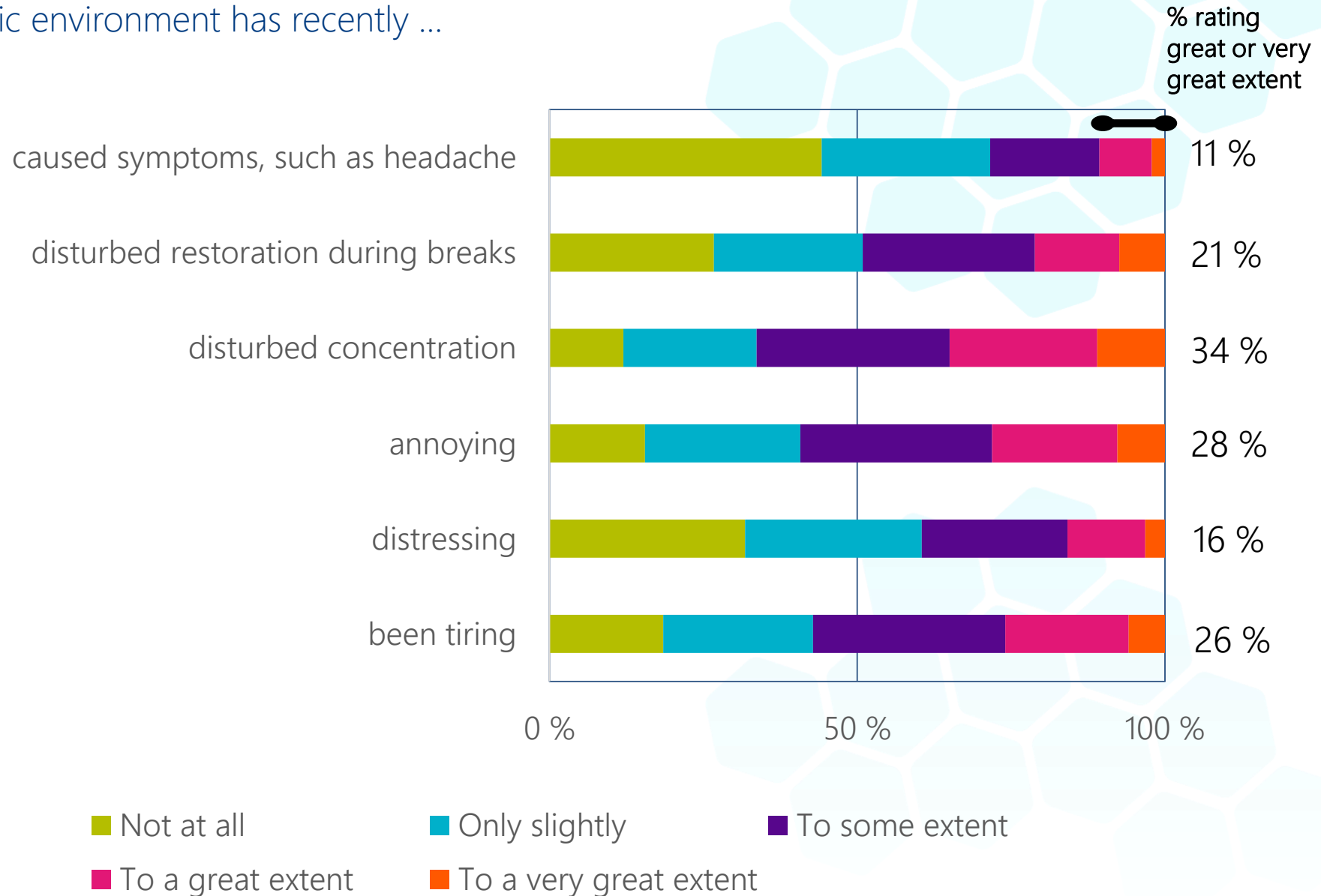


18. Do you have a code of conduct in your ward to achieve sufficient speech privacy?

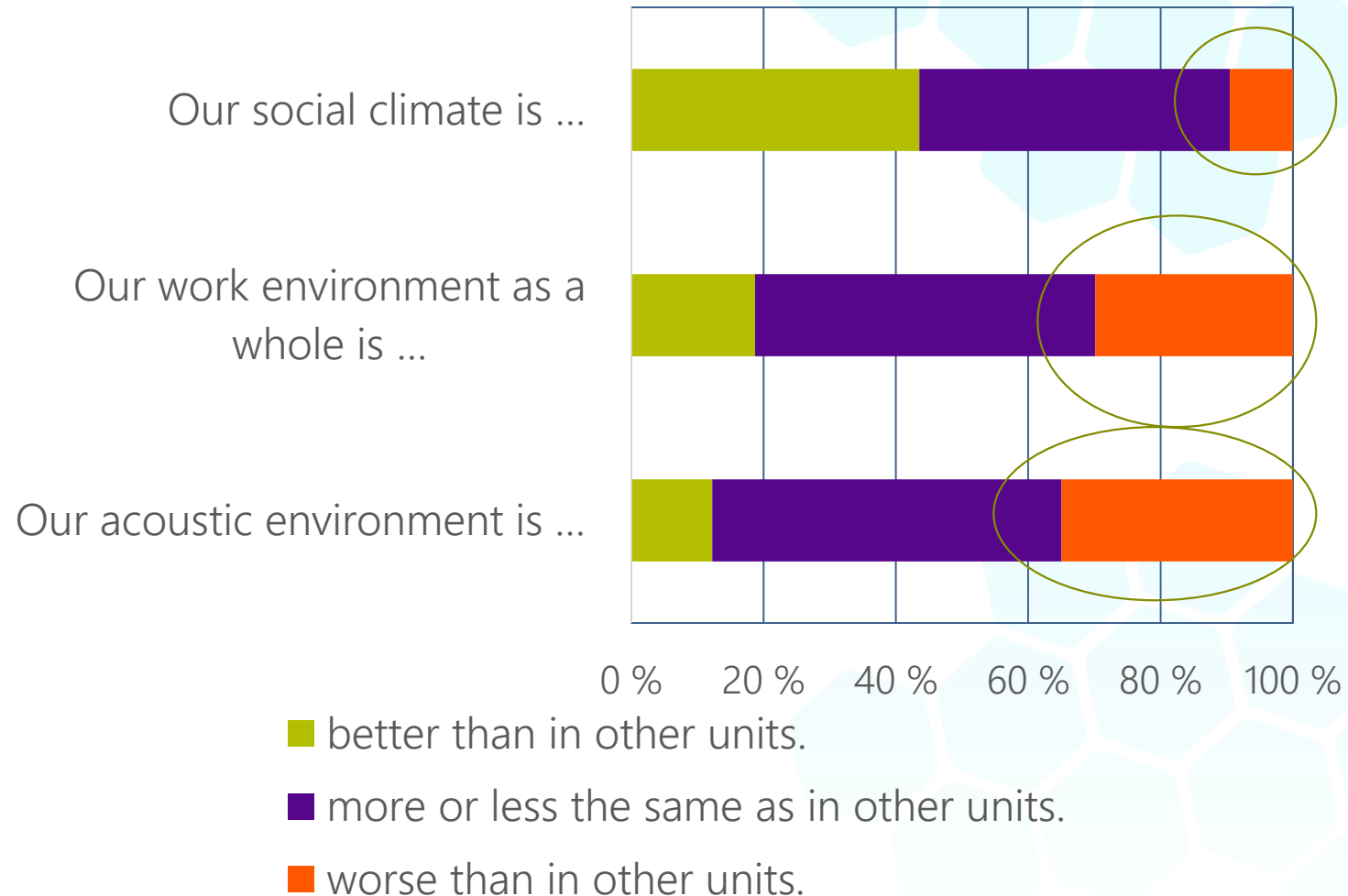


Psycho-physiological symptoms

Effects of acoustic environment has recently ...

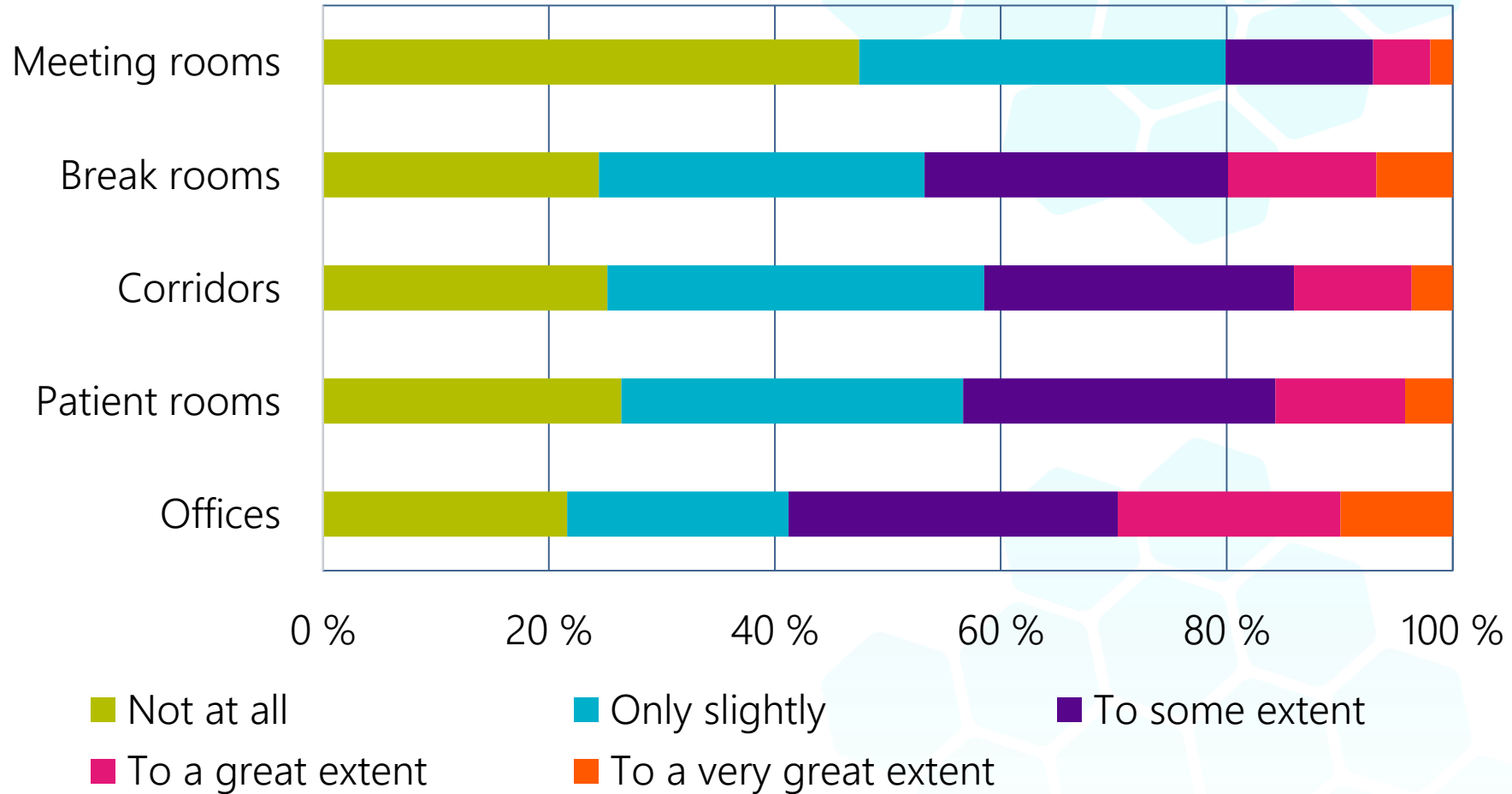


How is your unit compared to other units of this hospital campus?



Effects of noise on conversation

Has the acoustic environment of your unit hampered discussion in ...



Preliminary associations between subjective measures (bivariate correlation analyses)

- Job-, Environmental- and Acoustic satisfaction are associated with each other
- Environmental satisfaction is most strongly associated with
 - Lack of space, unfunctional spaces, and disorder ($r > 0.45 \dots 0.55$)
 - Noise was not so important ($r = 0.16 \dots 0.36$)
- Noise sensitivity was associated with Acoustic satisfaction ($r = 0.30$)
- Stress was associated with Job satisfaction ($r = 0.34$)
 - Ac-S (0.27), Env-S (0.24)
- Stress was weakly associated with individual environmental factors: Lack of space ($r = 0.23$) and phones sounds ($r = 0.23$) had the largest associations
- Multi-variate regression models hopefully emerge later

DETAIL: **Age** had no association with Job-, Environmental- and Acoustic satisfaction .

Noise levels

Unit Room	LAeq,8h [dB]		
	Evening	Night	Morning
Intensive care unit			
2-person patient room (critical care)	51	40	51
Corridor	55	50	58
4 person patient room (critical care)	52	52	54
Office room, aisle	50	45	54
Coffee room	60	60	62
3-person patient room	55	53	56
Gastroenterology 1/Surgeon 2			
Office room	56	51	42
Corridor	59	43	52
4 person patient room (critical care)	58	54	53
Monitoring room	57	44	55
Break room	58	51	62
Office secretary	49	35	57
Office	54	48	57
3-person patient room	45	38	47
Orthopedics and traumatology, ward			
6-person patient room	46	38	51
Office	56	49	53
Break room	57	50	61
Cancer ward (RS2)			
Reception/office	54	47	56
Office	53	45	53
Office (closed)	54	52	58
Reception/office	56	48	59
Patient citchen	47	38	49
Break room	52	42	56
MEAN OF ALL DATA	54	47	55

- 5 units have been measured using 24 hour logging time
- Levels are not high and largest levels occur in coffee rooms and offices
- Mean values are close to 55 dB
- Speech is the main sound source
 - Speech is both useful and necessary sound but it can be noise for those who are not involved with the conversation

	hours
Morning	07-15
Evening	15-23
Night	23-07

Objective evaluation of the units

Visual assessment by two researchers (ONGOING PART OF PROJECT)

- **Type of unit** (Normal ward, Intensive care, Polyclinics, Surgery, First aid, Maternity, Etc.)
- **Number of patients/staff**
- **Age of unit** Year of construction/renovation
- **Windows/view/natural light** (No, limited sight, sight to nature)
- **Ventilation system** (Gravity-based outlet, mechanical outlet/inlet)
- **Cooling system** (No, active convectors, active chilling beams)
- **Operation:** 8/5, 14/7, 24/7
- **Spatial density** (three classes)
- **Activity/hastiness** (High, moderate, peaceful)
- **Masking sounds** (Low/High)
- **Room absorption** (Five classes)

Noise level measurements

- 24 hour noise logging in ten wards

Evaluation in 30 out of 73
units where >10 respondents

Conclusions

- Final conclusions of AKUSAI wait for the objective data of the units
- The results concern Tampere University Hospital in 2015.
- However, building styles from 6 decades are involved as well as all kinds of medical units so that the results may have some general interest.
- Based on survey, some preliminary conclusions are...

Conclusions

- 885 respondents from 73 units
- Lack of space & unfunctionality of spaces were the main disturbants during nursing - noise disturbance was not so serious
- Noise levels were not high: 35 and 62 dB. Noise problems seem to deal with disturbance rather than noise levels.
- Speech and conversations were among main disturbants both during paperwork and indirect nursing
 - Variation between units was large
 - Differences between both activity and acoustic quality may explain the differences between the units
- Speech privacy was not well supported by spaces
- Acoustic environment caused strong psycho-physiological symptoms among 10 to 35 % of respondents



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Thank you!



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