

Case study

**Staff room at a medical emergency unit,
Hospital in Sweden**

090914

Background

- A new meeting/lunch room was built for the staff at the medical emergency unit
- When the room was taken into use, the staff perceived the acoustics in the room as very bad

The purpose of the study

- To improve the sound environment
- To study how the acoustic intervention affects the sound pressure level and the speech clarity
- To study if the staff noticed any change in the sound environment

The room

Ceiling: gypsum

Walls: gypsum

Floor area: 25 square metres



Requirements – sound environment

The staff would like the sound environment to be improved in the following ways:

- A lower sound level
- To make it easier to hear what is being said
- To make it easier to make yourself heard

Method

Part 1

Questionnaire to staff – before intervention

Acoustic measurement 1

Part 2

Acoustic ceiling & wall absorber installed

Acoustic measurement 2

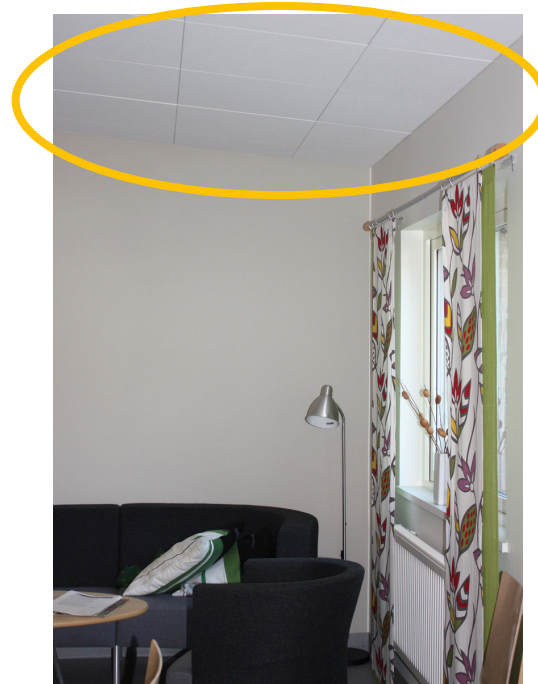
Questionnaire to staff – after intervention

Acoustic intervention

Before intervention: Gypsum in the ceiling

Acoustic intervention:

- Installation of an acoustic ceiling (absorption class A), covering 100% of the ceiling area, installed directly to the gypsum ceiling.
- Installation of one wall absorber on one of the walls, 2 700x1 200 mm.



Testimonials – before intervention

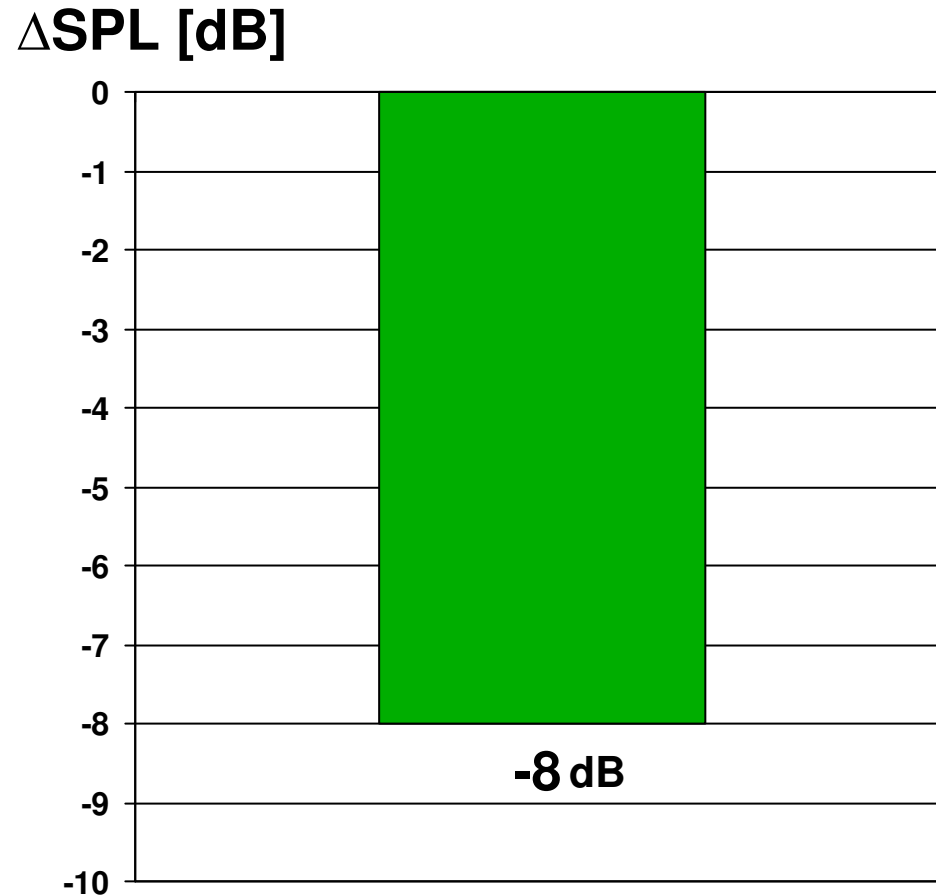
”An incredible din. When we are several persons in the room you can not make yourself heard, not even to the person sitting next to you.”

”I’ll have shorter breaks. I avoid having lunch at the same time as my colleagues.”

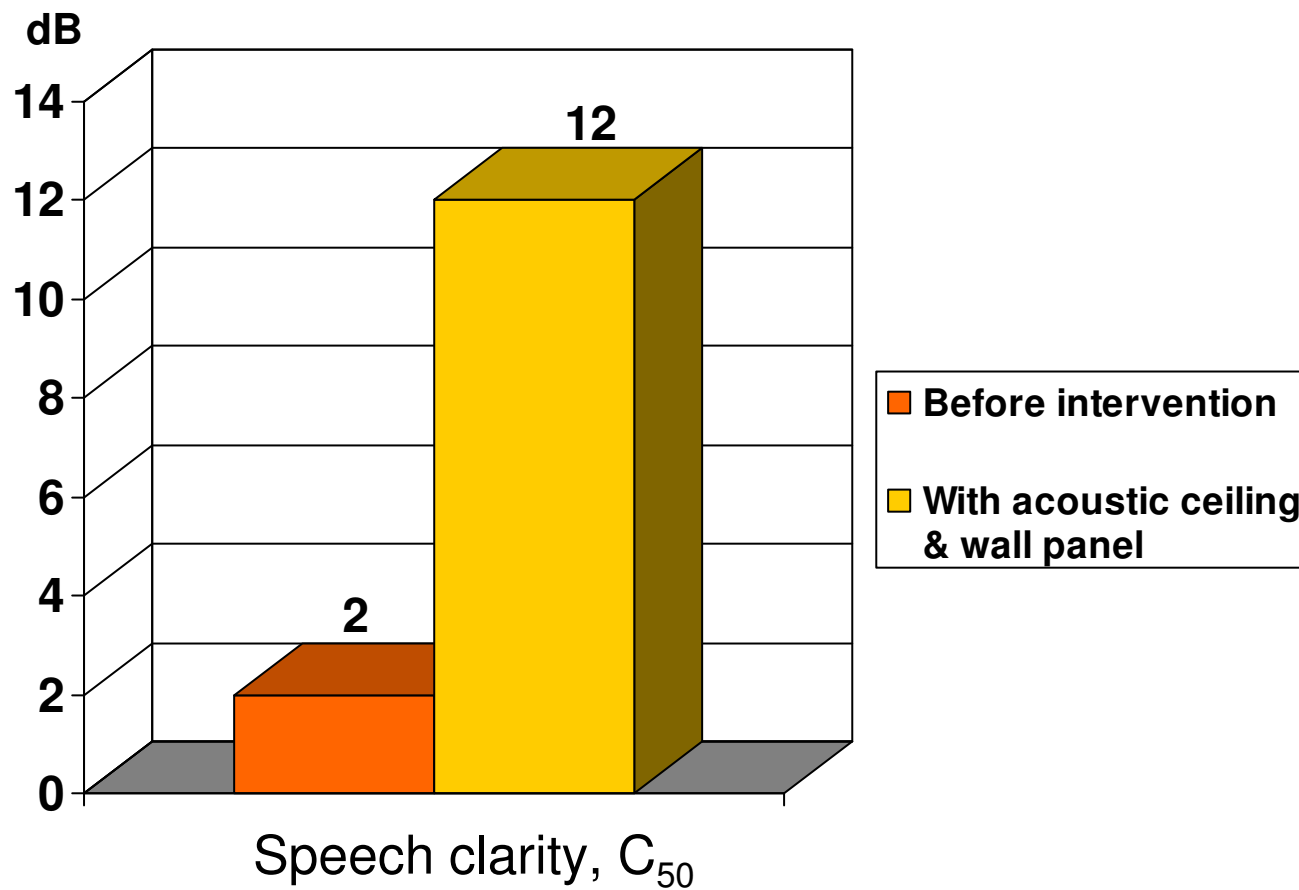
”Sometimes I have to ask afterwards what was being said on the meeting.”

Acoustic measurements - SPL

The change in SPL after the acoustic ceiling and wall absorbers were installed.



Acoustic measurements - C_{50}



Testimonials – after intervention

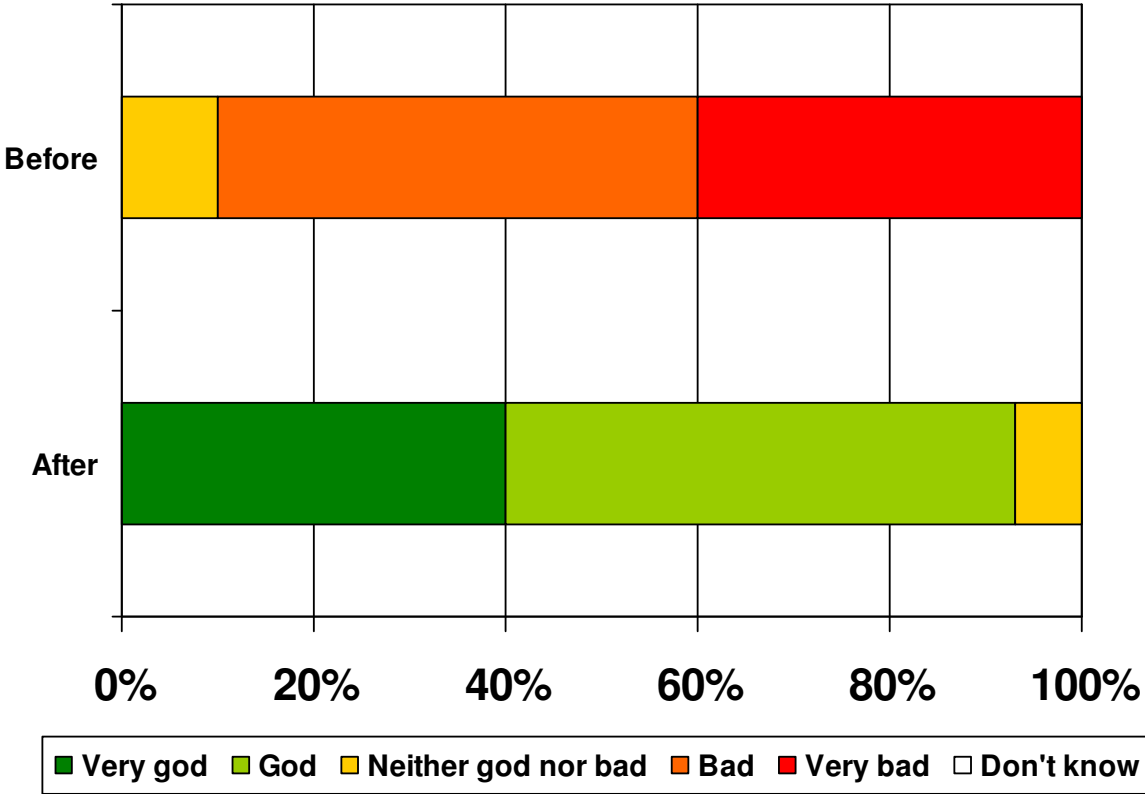
“The sound environment is much more dampened, it feels as if it is easier to relax in the room.”

“Now we can talk to each other reasonable levels”

“Less noisy when we are several persons in the room at the same time.”

“There is no echoes at all now. More than one discussion can take place at the same time in different parts of the room, and it still feels ok.”

In general, how do you perceive the sound environment?

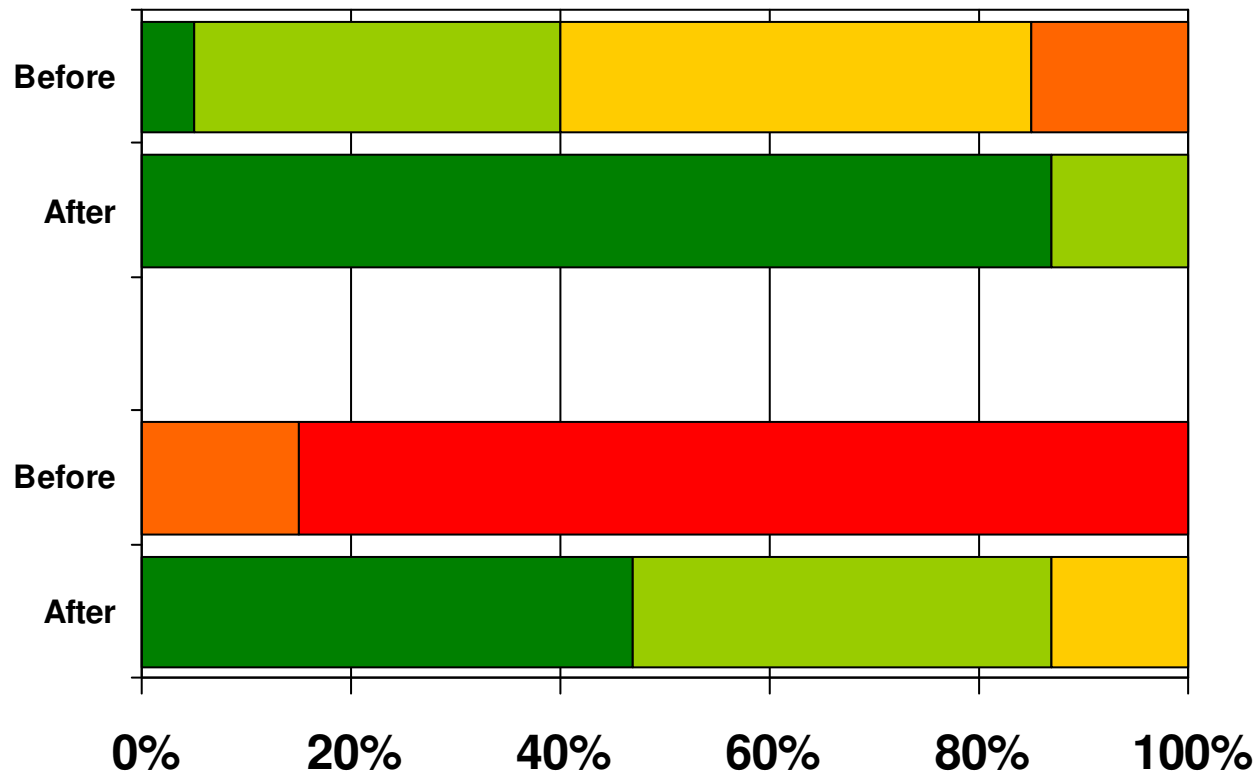


Opinions about the sound environment

Rate to what extent you agree or disagree in the following statements?

The sound environment is ok when there are a few people in the room

The sound environment is ok when there are several people in the room



■ 5=strongly agree
 ■ 4
 ■ 3
 ■ 2
 ■ 1=strongly disagree
 Don't know

Opinions about the sound environment

The sound environment makes me tired



The sounds in the room are sharp



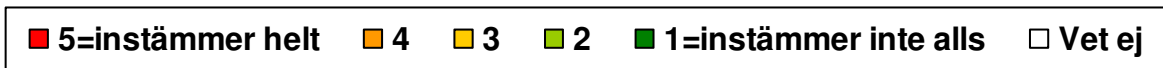
The sound environment is reverberant/not damped



I sometimes leave the room after a short time because of the sound environment



0% 20% 40% 60% 80% 100%



About the acoustic measurements

- *An omni-directional loudspeaker was used for the measurements.*
- *Measurement signal: swept sinusoidal signal was used.*
- *The measurement procedure followed the guidelines in ISO 3382:1.*

Conclusions

The acoustic intervention resulted in:

- *Lower SPL*
- *Better speech intelligibility*
- *A sound environment that is perceived as much better in several ways by the staff*