Finnish Institute of Occupational Health

Noise risks in the entertainment sector

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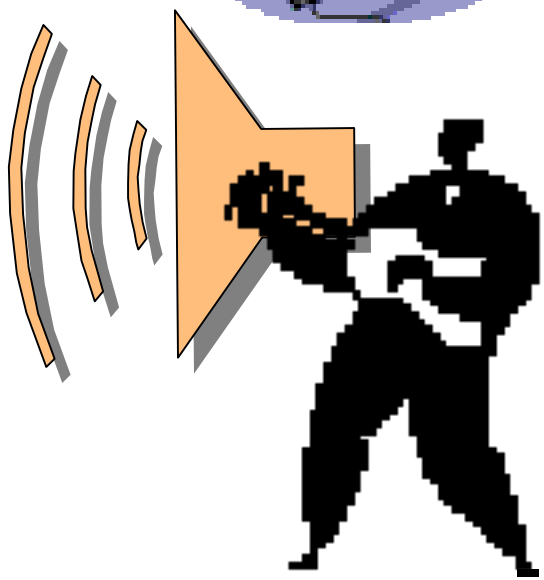
What are entertainment jobs

Bartender

DJ



Musicians

Portier, controller

Waiter

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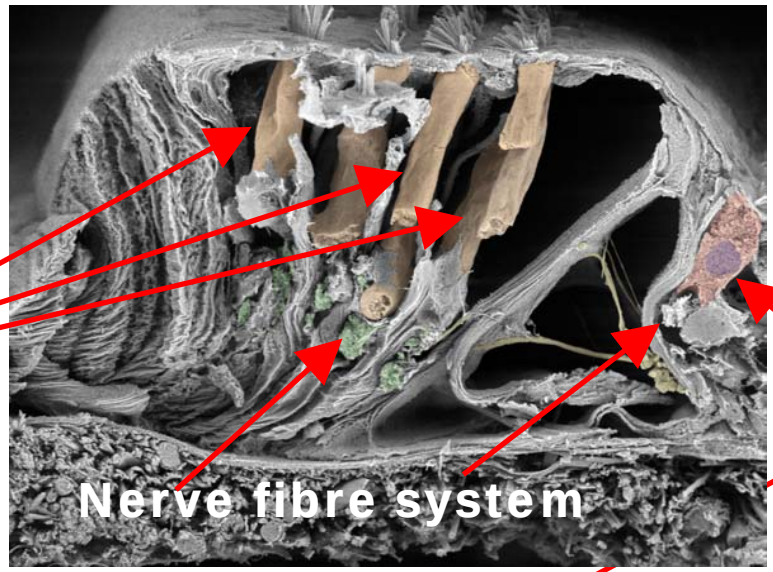
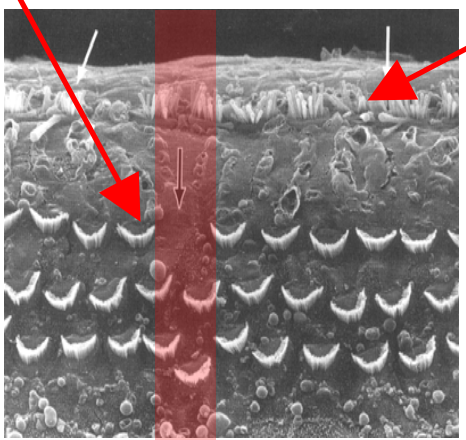
The hearing organ

Supporting cells

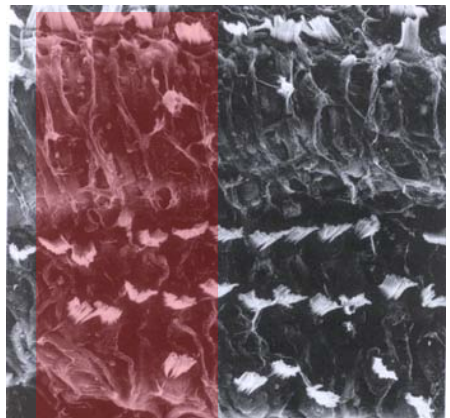


Outer hear cells

Inner hear cells



Noise



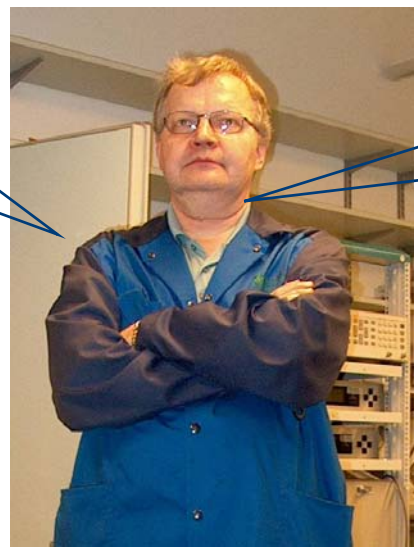
Effects of noise to hearing organ

- Loss of hear cells
  - Change in hearing threshold (Audiometry)
  - Loss of speech intelligibility especially in background noise
  - Death of fibre nerves
- Damage of fibre nerves
  - Tinnitus
- Damage of supporting cells
  - Hyperacusis (pain in the ears)

Entertainment sector should be excluded from noise directive

- Musicians hearing corresponds to hearing of non-exposed population
- Common explanations
  - Training
  - Music is less damaging than industrial noise
  - exposure is interemittent

Is this true?



What about the other groups ??

Prevalence of noise symptoms among musicians

- Hearing loss 5-15%
  - About the same than non-exposed population
- Permanent tinnitus 15-20 %
- Tinnitus after rehearsals or performances 60-70 %
- Hyperacusis 40-60 %

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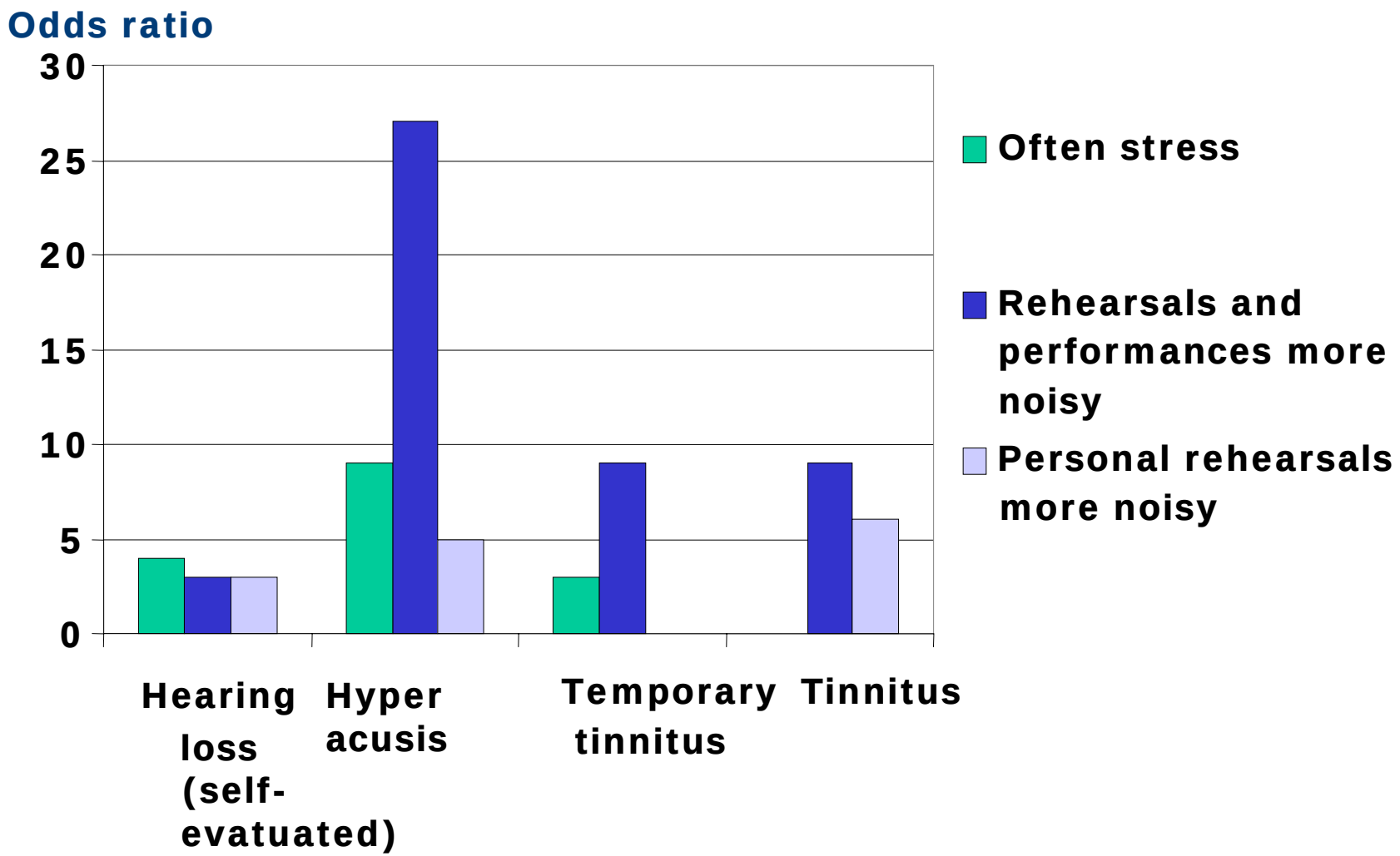
The effect of hearing symptoms among musicians



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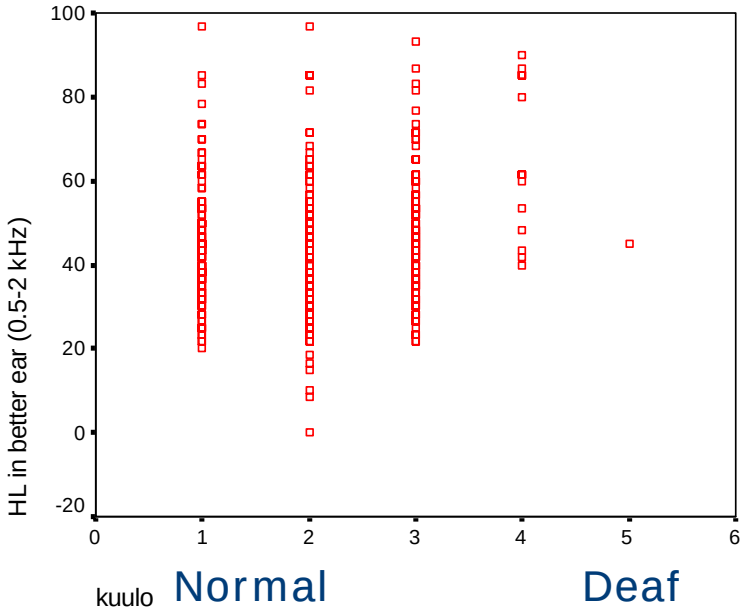
Noise induced hearing loss

- Measured using audiometer
  - Detection requires 60 % loss of hearcells
- Self-evaluated hearing loss
  - Extemely poor correlation with audiogram
  - Depends on tinnitus and hypeacusis
  - Communication need at work makes people more sensitive to hearing loss
- Characteristics
  - Large variation
  - Noise explains less than 20 % of variation
  - Nosocusis and noise explains 40-50% of variation
  - Closely related to presbycusis (age related hearing loss)



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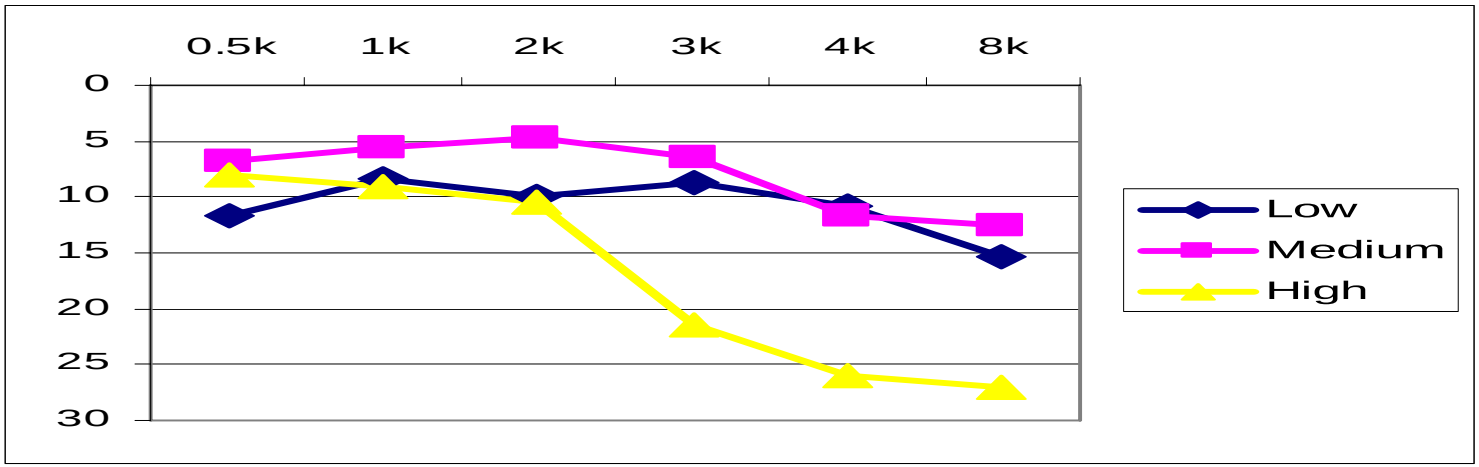
NOSOKUSIS

- ELEVATED CHOLESTEROL
- ELEVATED BLOOD PRESSURE
- SMOKING
- PAIN KILLERS
- WHITE FINGER DISEASE
- SOCIAL NOISE

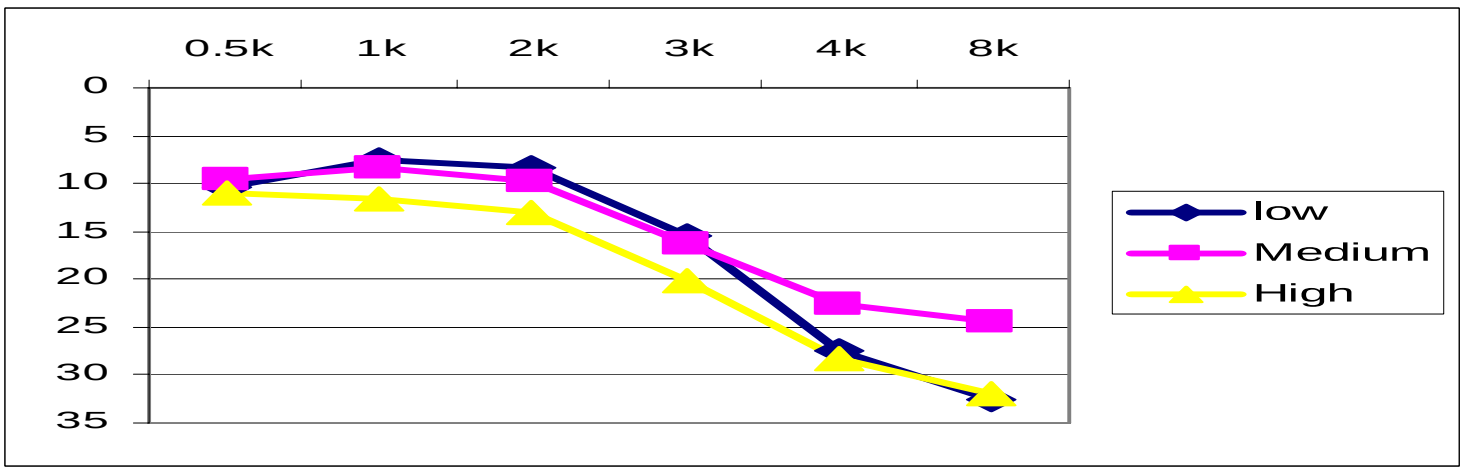
EXPLAINS 40-50% OF HEARING LOSS

Effect of noise exposure to hearing among people with different number ofrisk factors

1 risk factor



more then 3 risk factors



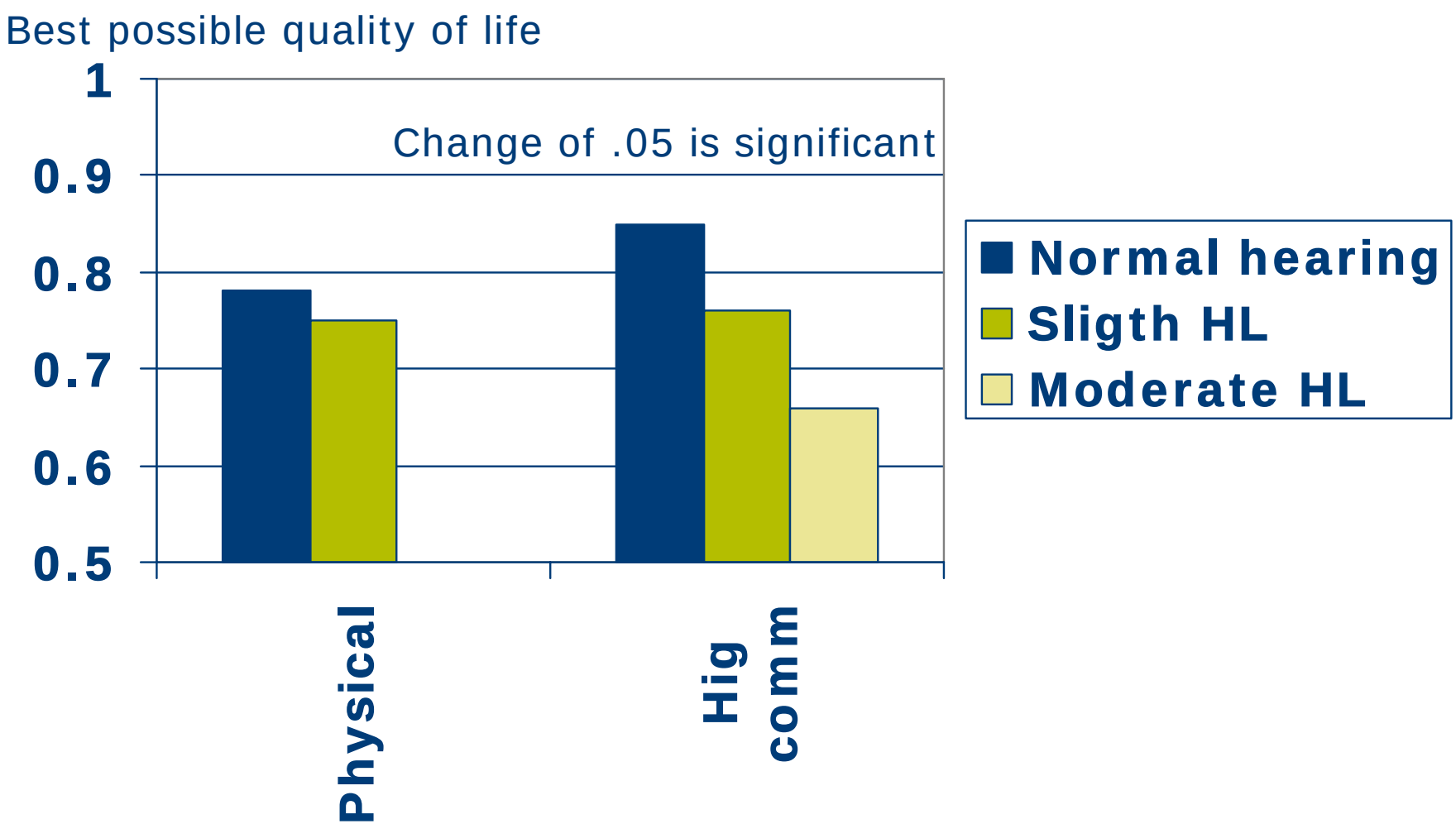
Finnish study in 5 classical orchestras in Helsinki

- Sosiokusis
  - Musicians have less risk factors than average population
  - Comparison with fighter pilots-> same risk
  - Comparison with blue collar workers with same risk profile ->same risk
- **Music is causes an equal risk than industrial noise**

Other groups

- Few studies
- General rules
  - Even slight hearing loss aggravates communication in high background noise
  - Noise causes stress sleep disturbances, balance problems
- Order of problems (Production staff of Finnish broadcasting company)
  - Hyperacusis related to work 30%
  - Self evaluated hearing loss 20 %
  - Tinnitus related to work 50%
  - Often sleep disturbance 20%
  - Balance problems related to work 25 %
- How to evaluate the combined effect of tinnitus, hearing loss, hyperacusis and other symptoms
  - Evaluate the effect of hearing to quality of life (European Quality of Life -5 dimensions EQoL-5D)

Self evaluated hearing loss and quality of life (EQoL-5D)



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Summary

- Technically workers in entertainment sector are workers with high communication need in high background noise
  - Pilots, delivery trucks, headphone users in industry
- Small hearing impairment has dramatic effect to quality of life and job satisfaction
  - Prevalence of self evaluated hearing loss 20-40%
  - Tinnitus and hyperacusis have often higher effect than hearing loss