Economic Impact of hearing loss: the different systems of hearing management

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www.aea-audio.org
Self-Reported Hearing Loss

- Includes Awareness: *If you experience and report hearing problems – you’re more likely to take action*
- Available for more countries – EuroTrak – JapanTrak – MarkeTrak
- Empowers people – your experience & your needs

Measured Hearing Loss

- The Audiogram: *Assess when you start to hear soft pure tones*
% Self Reported Hearing Loss <> Population 65 years and older

% of people reporting hearing problems (EuroTrak 2015 green - Projected red)

Population 65 years and older in % (Eurostat 2015)

Source of basic data:
EuroTrak 2015/18
https://www.populationpyramid.net
https://www.populationpyramid.net
% Self Reported Hearing Loss <-> Population 65 years and older

Population 65 years and older in % (Eurostat & Worldbank 2016)

Source of basic data: EuroTrak 2015/18
Specific focus for Middle East: Relation Diabetes & Hearing Loss

In 2013, Horikawa et al conducted a meta-analysis. They concluded that diabetic patients were 2.15 times more likely to have hearing loss than non-diabetic patients, regardless of age.

Meta-analysis of Akinpelu et al 2014
The odds of hearing impairment were 1.91 times higher for subjects with diabetes type 2.
Specific focus for Middle East: Relation Diabetes & Hearing Loss

The age-adjusted comparative prevalence of diabetes worldwide in 2017: World average 8.5% >= 10.8% in the Middle East.
Best Estimate - Uptake Hearing Aids (Self Reported Hearing Loss)

United States: Uptake 30%
Europe: Uptake 29%
South America: Uptake 15%

Best estimate
Model based on N. Bisgaard
Heal 2018

We have little or no systematic information on the uptake of hearing aids in the middle east.
Estimates vary from 1% to 10% uptake

Source of basic data:
EuroTrak 2015/18
Prevention
• Avoid Noise
• Promote safe listening
• Protect your ears
• Prevent and treat ear infections …

Do you use earplugs when you know that that sound level is so loud it can create hearing loss?

DIRECTIVE 2003/10/EC
85 dBA
Hearing Protection Required

The best is only 19% ??
Awareness

- Hearing Screening
  - National paediatric screening
  - School children screening
  - Adult screening (from 50 years onwards)
- Information Campaigns

Newborn and infant hearing screening

CURRENT ISSUES AND GUIDING PRINCIPLES FOR ACTION

Adult Hearing Screening: Can we afford to wait any longer?

Brian Lamb OBE, Sue Archbold PhD

Report and resource supported by a grant from Advanced Bionics.

The report is the work of the authors.
Awareness
- Hearing Screening
  - National paediatric screening
  - School children screening
  - Adult screening (from 50 years onwards)
- Information Campaigns

Intervention
- Professional Hearing Care
- Hearing Systems & ALD’s
  - Hearing Aids
  - Cochlear Implants & Other
- Rehabilitation & Tinnitus Management

Make sure that intervention is in place before creating awareness!
Why do we need to invest in Hearing Care?

The cost of untreated hearing loss!

Communication
- Spoken language
- Ability to communicate

Education
- Increased need for assistance
- Fewer learning opportunities

Employment
- Higher unemployment rates
- Lower wages

Social and emotional
- Social exclusion
- Dependence and dementia

Intervention
- Professional Hearing Care
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World Health Organization

World Health Organization
$750 billion annually

European Association of Hearing Aid Professionals

IFOS WORLD COURSE ON HEARING REHABILITATION
Why do we need to invest in Hearing Care?

Communication and Education

Conclusion:
Our analysis reveals that decreased QOL in children with HL is detected in distinct domains of the PedsQL. These domains “school activities and social interactions” are especially important for development and learning.

Intervention
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• Increased need for assistance
• Fewer learning opportunities

Otolaryngology–Head and Neck Surgery

Quality of Life in Children with Hearing Impairment
Systematic Review and Meta-analysis
Lauren Roland, MD, MScI, Caroline Fischer, Kayla Tran, more...
First Published April 26, 2016 | Review Article | Check for updates
https://doi.org/10.1177/0194599816640485
### Why do we need to invest in Hearing Care?

#### Employment

- Higher unemployment rates
- Lower wages

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**Intervention**

- Professional Hearing Care
- Hearing Systems & ALD’s
  - Hearing Aids
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- Rehabilitation & Tinnitus Management

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People with untreated Hearing Loss have a significant disadvantage in communication jobs!
Why do we need to invest in Hearing Care?

Intervention
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- Rehabilitation & Tinnitus Management

Employment
- Higher unemployment rates
- Lower wages

People with untreated Hearing Loss experience significantly more listening effort … this increases the risk of “burnout” in communication jobs

Relation Between Listening Effort and Speech Intelligibility in Noise

Melanie Krueger, Michael Schulte, Melanie A. Zokoll, Kirsten C. Wagener, Markus Meis, Thomas Brand, and Inga Holube

Hearing Research 351 (2017) 68–70

Impact of stimulus-related factors and hearing impairment on listening effort as indicated by pupil dilation

Barbara Ohlenforst, Adriana A. Zekveld, Thomas Lunner, Dorothea Wendt, Graham Naylor, Yang Wang, Niek J. Versfeld, Sophia E. Kramer
Why do we need to invest in Hearing Care?

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Employment
- Higher unemployment rates
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36% of the people who retired early in the UK, did so because of their hearing loss!
Why do we need to invest in Hearing Care?

Dependence and dementia

Intervention
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Social and emotional
- Social exclusion
- Dependence and dementia

Hearing Loss is the modifiable risk factor for Dementia with the highest impact!

Hearing Care = Prevention

35% of the risk factors for dementia are modifiable ... Hearing loss represents 9% of the 35% and is the most significant factor!
**Why do we need to invest in Hearing Care?**

Dependence and dementia

Cognition is significantly poorer for subjects with hearing loss

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**Intervention**
- Professional Hearing Care
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Social and emotional
- Social exclusion
- Dependence and dementia

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This team follows a cohort of 3777 subjects in Bordeaux for 25 years (they started in 1989 and will end in 2015. Every two years the run a full evaluation done by a psychologist.

- **Cognition (MMS & other) significantly poorer for subjects with hearing loss** (p 0.01 – adjusted for age, gender and educational level)
**Why do we need to invest in Hearing Care?**

**Dependence and dementia**

Self-Reported Hearing Loss, Hearing Aids, and Cognitive Decline in Elderly Adults: A 25-Year Study

Hélène Amieva, PhD, Camille Ouerard, MSc, Caroline Giudici, MSc, Céline Meillon, MSc, Laetitia Rullier, PhD, and Jean-François Dartigues, MD, PhD

JAGS 63:2099–2104, 2015

- **Hearing Loss**
  - No Hearing Care
  - Hearing Aid Users

- **Cognition**
  - Hearing Impaired Hearing Aid Users did not present Cognitive Decline (p=0.08)
  - They also find a long term positive effect of hearing aids – For the hearing impaired subjects not using hearing aids there was a clear Cognitive Decline (p < 0.001) and Hearing Impaired Hearing Aid Users did not present Cognitive Decline (p=0.08)

**Intervention**

- Professional Hearing Care
- Hearing Systems & ALD’s
  - Hearing Aids
  - Cochlear Implants & Other
- Rehabilitation & Tinnitus Management

**Social and emotional**

- Social exclusion
- Dependence and dementia

**Hearing Impaired Hearing Aid Users did not present Cognitive Decline (p=0.08)**
**Why do we need to invest in Hearing Care?**

**Dependence and dementia**

- **Intervention**
  - Professional Hearing Care
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**Social and emotional**

- **Social exclusion**
- **Dependence and dementia**

**IADL Independence significantly lower for subjects with hearing loss**

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**IADL scale:**
- phone, shopping, housekeeping, meals, laundry, domestic finances, transports, medication

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**Dependence IADL**

This team follows a cohort of 3777 subjects in Bordeaux for 25 years (they started in 1989 and will end in 2015. Every two years the run a full evaluation done by a psychologist. b

- **IADL Independence significantly lower for subjects with hearing loss** (p 0.01 – adjusted for age, gender and educational level)

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**Lawton Instrumental Activities of Daily Living (IADL) Scale**
**Intervention**
- Professional Hearing Care
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**Social and emotional**
- Social exclusion
- Dependence and dementia

**Hearing Impaired Hearing Aid Users**
- Users did not present decreased IADL (Independence)

**Why do we need to invest in Hearing Care?**
- Dependence and dementia

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**Research Article**

*Death, Depression, Disability, and Dementia Associated With Self-reported Hearing Problems: A 25-Year Study*

Hélène Arnaud, PhD, Camille Courval, PhD, Céline Meillon, MSc, Laetitia Rullier, PhD, and Jean-François Dartigues, MD, PhD

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**IADL scale**:
- Phone
- Shopping
- Housekeeping
- Meals
- Laundry
- Domestic finances
- Transports
- Medication

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**They also find a long term positive effect of hearing aids** – For the hearing impaired subjects not using hearing aids there was a clear decrease of IADL Independence (p < 0.001) and Hearing Impaired Hearing Aid Users did not present decreased IADL (p=0.59)

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**Lawton Instrumental Activities of Daily Living (IADL) Scale**
Why do we need to invest in Hearing Care?

Cost-effectiveness of interventions

Cochlear implants are shown to be most cost-effective when fitted at an early age.
( WHO report – 2017)

Use of hearing aids is shown to be cost-effective, especially use is continuous and accompanied by audiological rehabilitation.
( WHO report – 2017)

Interventions in Hearing Care (Hearing Aids & Cochlear Implants) have a return on investment of 10 to 1
(L. Hartmann – 2017)

Intervention

- Professional Hearing Care
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  - Hearing Aids
  - Cochlear Implants
- Rehabilitation & Tinnitus Management
State Organised versus Free Market Hearing Care?

State Organised (Mix): Denmark – UK – Sweden – Norway
Free Market (Refund): France – Switzerland – Germany - Italy

State Organised Systems lead to more people having hearing aids
Free Market Systems lead to more active use of hearing aids
Free Market Systems lead to higher satisfaction with hearing care

Source of basic data: EuroTrak 2012 - 2018
Intervention
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State Organised versus Free Market Hearing Care?

State Organised (Mix): Denmark – UK – Sweden – Norway
Free Market (Refund): France – Switzerland – Germany - Italy

Involvement of the user
Freedom of choice
Selection to cover real needs

Easy Access to Quality Hearing Care
Avoid long waiting lists
Continued Quality Service

Take the time and listen to the user
Counselling and empathy
Combine psychology & technology

Source of basic data: EuroTrak 2012 - 2018
Conclusions

**Prevention**
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- Protect your ears
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**Intervention**
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**Conclusions**
- A lot of standards and laws are in place or in development
- But we need to change behaviour!
- Basis for the Safe Listening WHO action
- All hearing care professionals need to be promotors

**Prevention**
- Paediatric Screening needs to get the highest priority
- School screening can also be organised as self-test
- Adults screening is the new challenge … also here self-test could be a very cost-effective intervention
- **But is this always ethical? Awareness without Intervention? … Needs to go step by step**

**Intervention**
- Hearing care is cost-effective. 10 to 1 return on investment
- Education and Language development is improved
- Finding and Keeping a job is improved
- Hearing Care has to be seen as modifying a high risk factor for Dementia and Dependence

**Awareness**
- Paediatric Screening needs to get the highest priority
- School screening can also be organised as self-test
- Adults screening is the new challenge … also here self-test could be a very cost-effective intervention
- **But is this always ethical? Awareness without Intervention? … Needs to go step by step**