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# EVOTION

*BIG DATA SUPPORTING PUBLIC HEARING HEALTH POLICIES*

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**ICCS**

**BIG DATA FOR PRECISION MEDICINE SYMPOSIUM**

**6<sup>th</sup> Hellenic Forum for Science, Technology and Innovation**



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# EVOTION Consortium



CITY UNIVERSITY  
LONDON



NOFER INSTITUTE OF OCCUPATIONAL MEDICINE

Guy's and St Thomas' NHS  
NHS Foundation Trust



UNIVERSITÀ  
DEGLI STUDI  
DI MILANO



HELLENIC REPUBLIC  
National and Kapodistrian  
University of Athens



REPUBLIC OF BULGARIA  
Regional Administration  
Pazardzhik



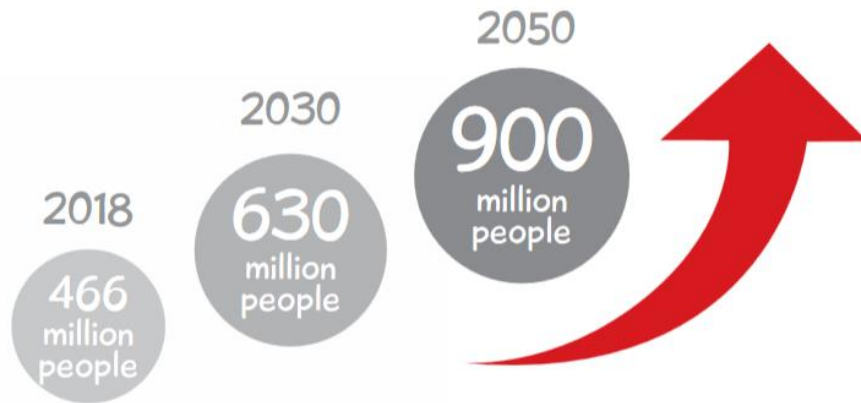
ATHENS MEDICAL  
GROUP



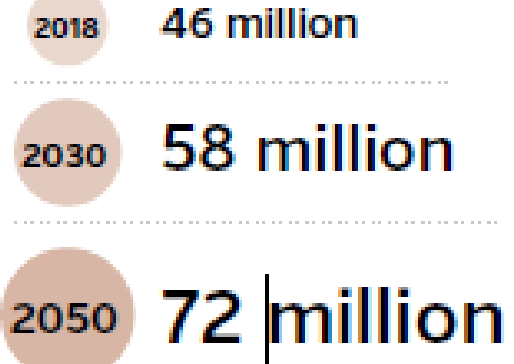
## KEY DATA

Coordinator	Niels Henrik Pontoppidan, Oticon, DK
Technical Coor.	George Spanoudakis, CITY University, UK
Scientific Coor.	Doris-Eva Bamiou, University College London, UK
Website	<a href="http://h2020EVOTION.eu">h2020EVOTION.eu</a>
EU Grant	5 Mil EUR
Duration	1 NOV 2016 –31 OCT 2019

# WHO: new estimates for disabling hearing loss

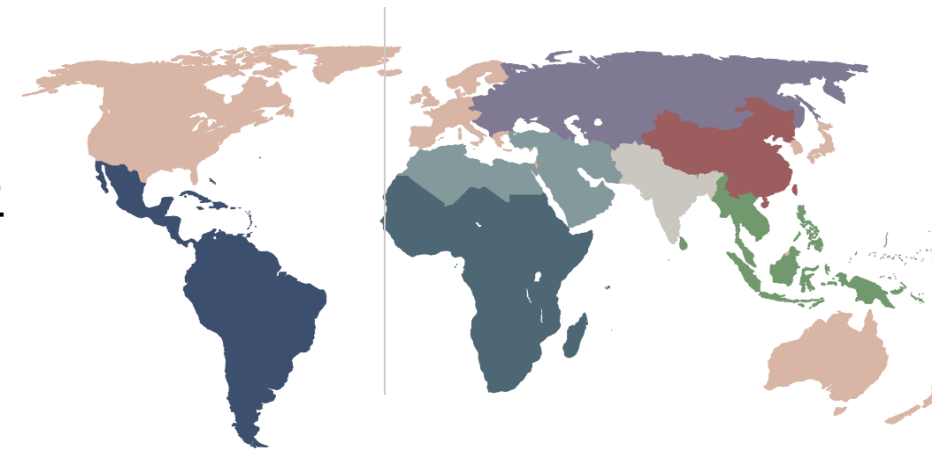


## High-Income



## 2018 Population: Total, hearing loss, prevalence

World.....	7.63bn	466m	6.1%
High income countries.....	886m	46m	5.2%
EU population.....	513m	27m	5.3%



# Impact of Hearing Loss

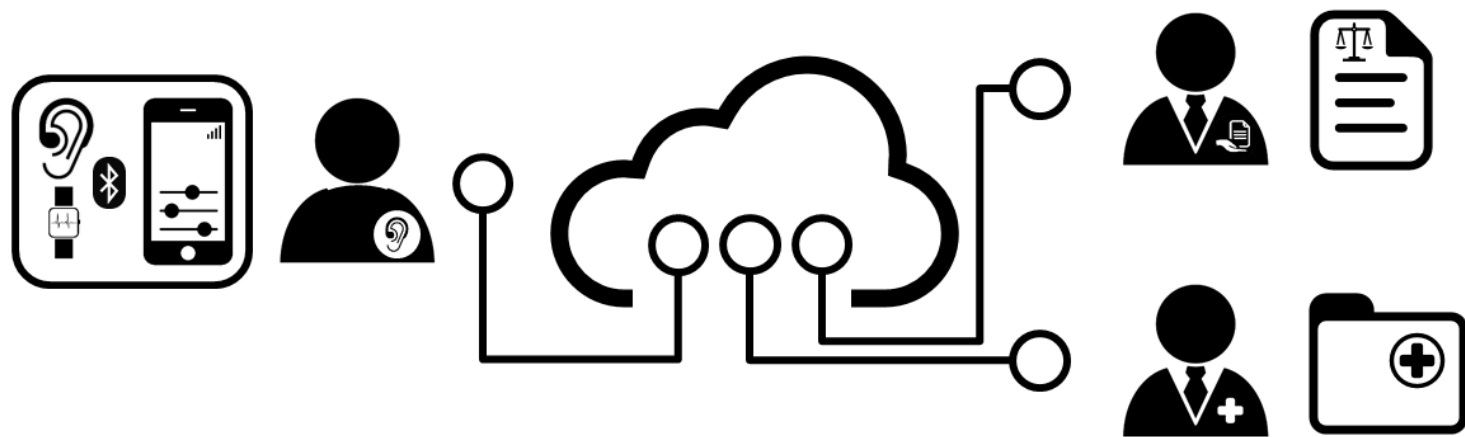
- Quality of Life
- Huge socioeconomic Costs
  - Risk of Cognitive Decline
  - Mental illness
  - Depression
  - Social Isolation
  - Unemployment
  - Early Retirement
  - Work and Social Discrimination



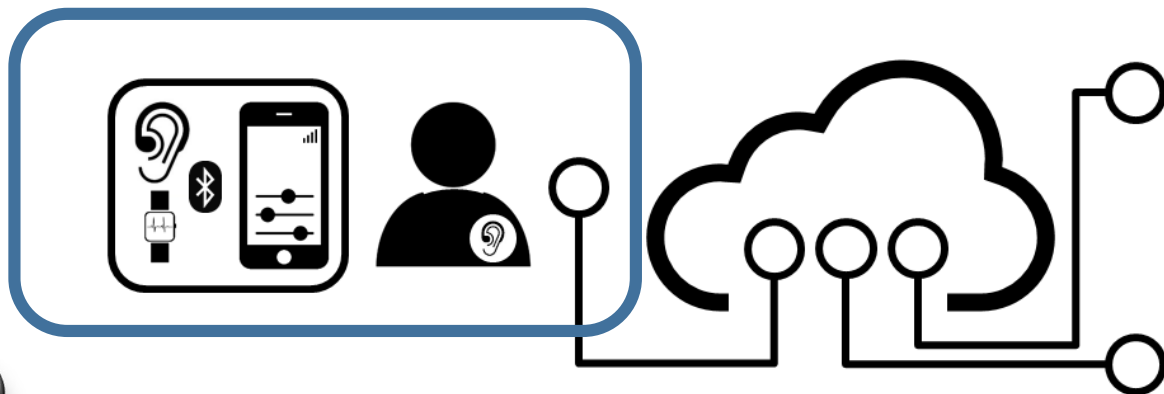
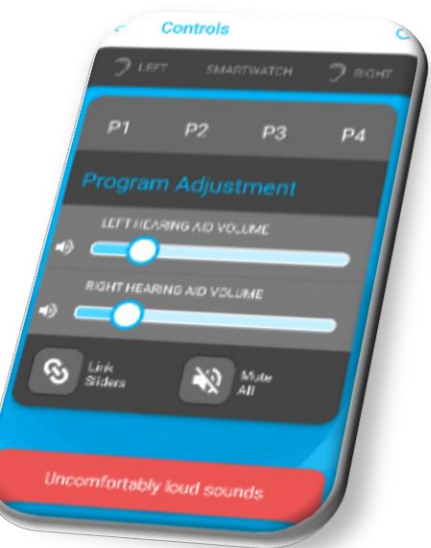
# Rationale for public health policy decisions

- Public health methods are needed to address hearing loss on a large scale within countries.
- Good public health policy decisions are essential in order to develop and implement effective and cost-effective programmes.
- Policies for hearing loss treatment are under revision
  - Partially deregulated in US with PCAST
  - Stricter policies for providing hearing aids proposed/considered
  - Reports claiming that societies spending on hearing treatment saves money
- Links between hearing loss and cognitive decline emerging
  - Maharani et al 2018: *Longitudinal Relationship Between Hearing Aid Use and Cognitive Function in Older American*. Journal of America Geriatrics Society
  - Livingston et al 2017: *Dementia prevention, intervention, and care*. The Lancet
  - Amieva et al 2015: *Self-Reported Hearing Loss, Hearing Aids, and Cognitive Decline in Elderly Adults: A 25-Year Study*. Journal of America Geriatrics Society

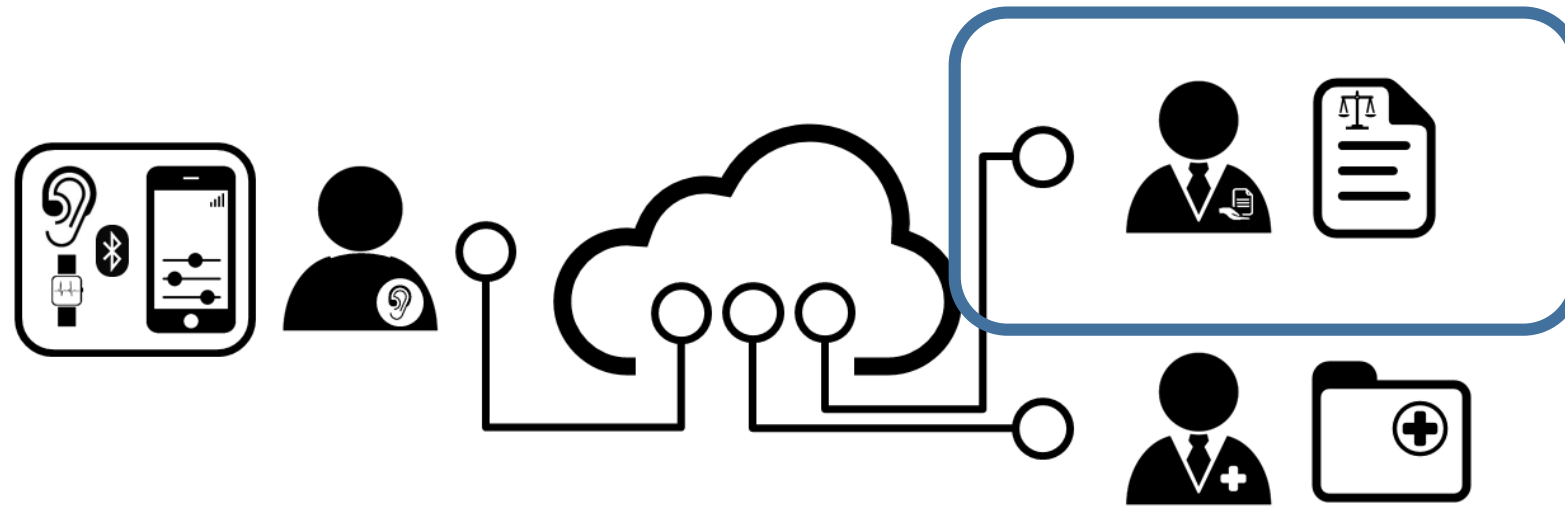
# EVOTION Platform



# EVOTION Platform

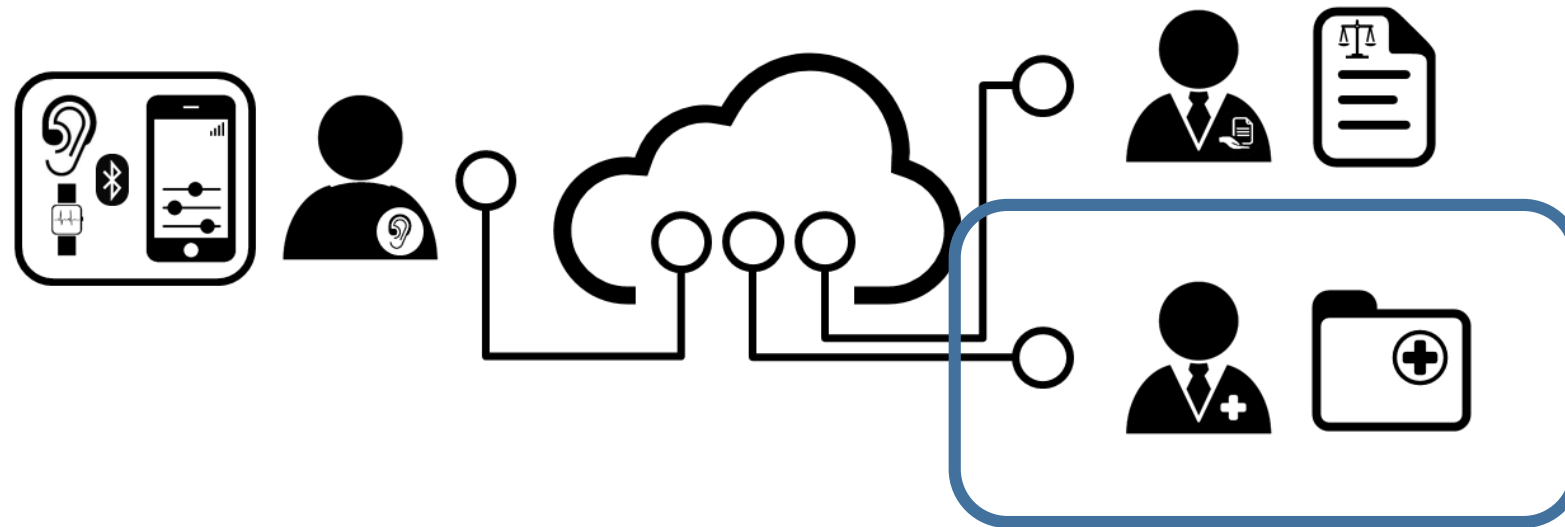


# EVOTION Platform

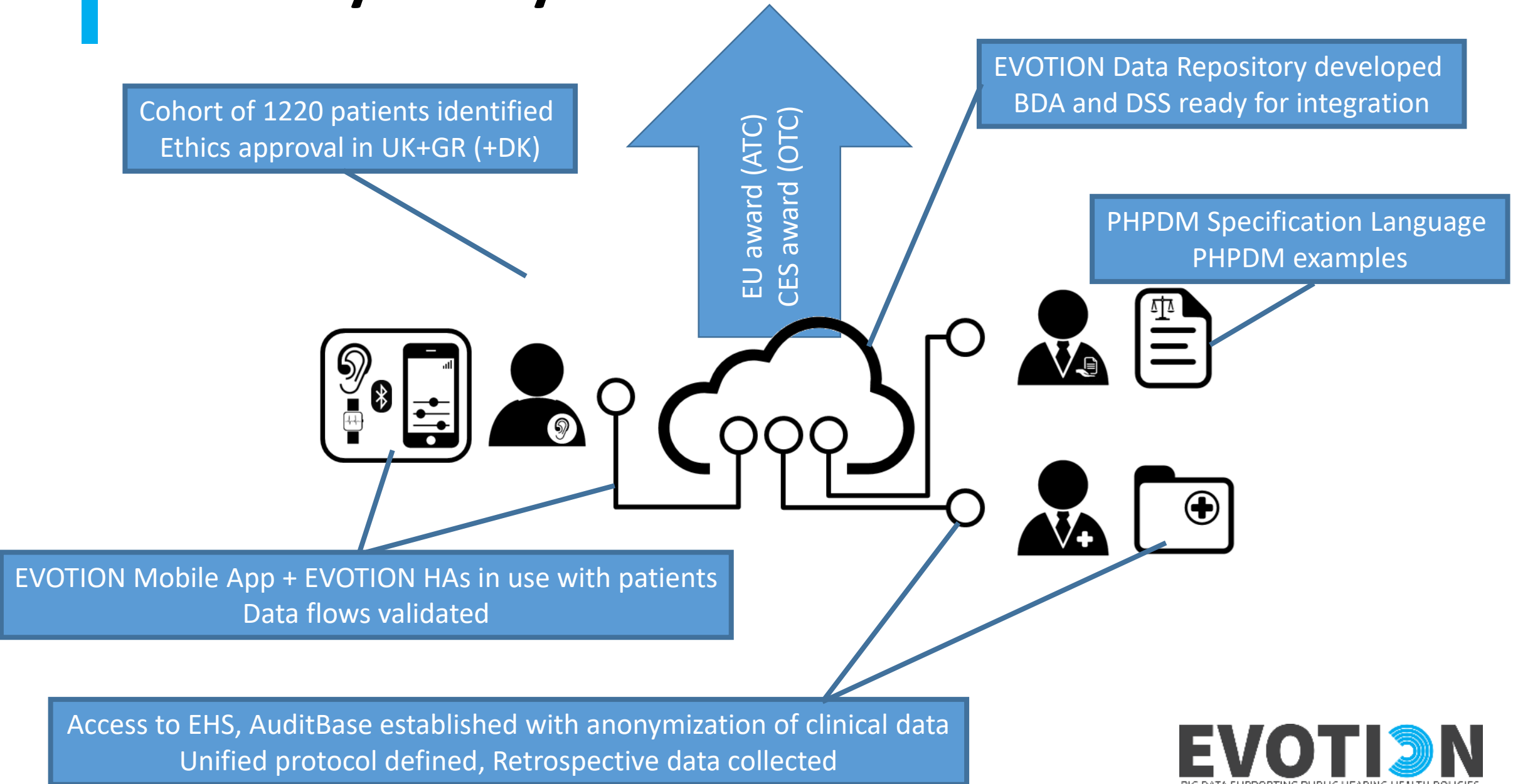




# EVOTION Platform



# Summary of key collective achievements



# Overview of Progress

- The platform components enable the platform to:
  - collect data from the developed EVOTION hearing aids, the wearable biosensor, and the EVOTION app (data collector)
  - collect retrospective and current patient data from existing clinical repositories
  - perform big data analytics, and
  - perform decision support and simulation.
- In parallel to the implementation of the platform:
  - EVOTION has developed a unified protocol for managing over 1200 patients across the clinical sites in Greece, the UK and Denmark.

# Progress beyond the State-of-the-Art

EVOTION has successfully initiated the largest ever research study of hearing problems with concurrent collection of dynamic data as part of the standard clinical pathway and with patients.

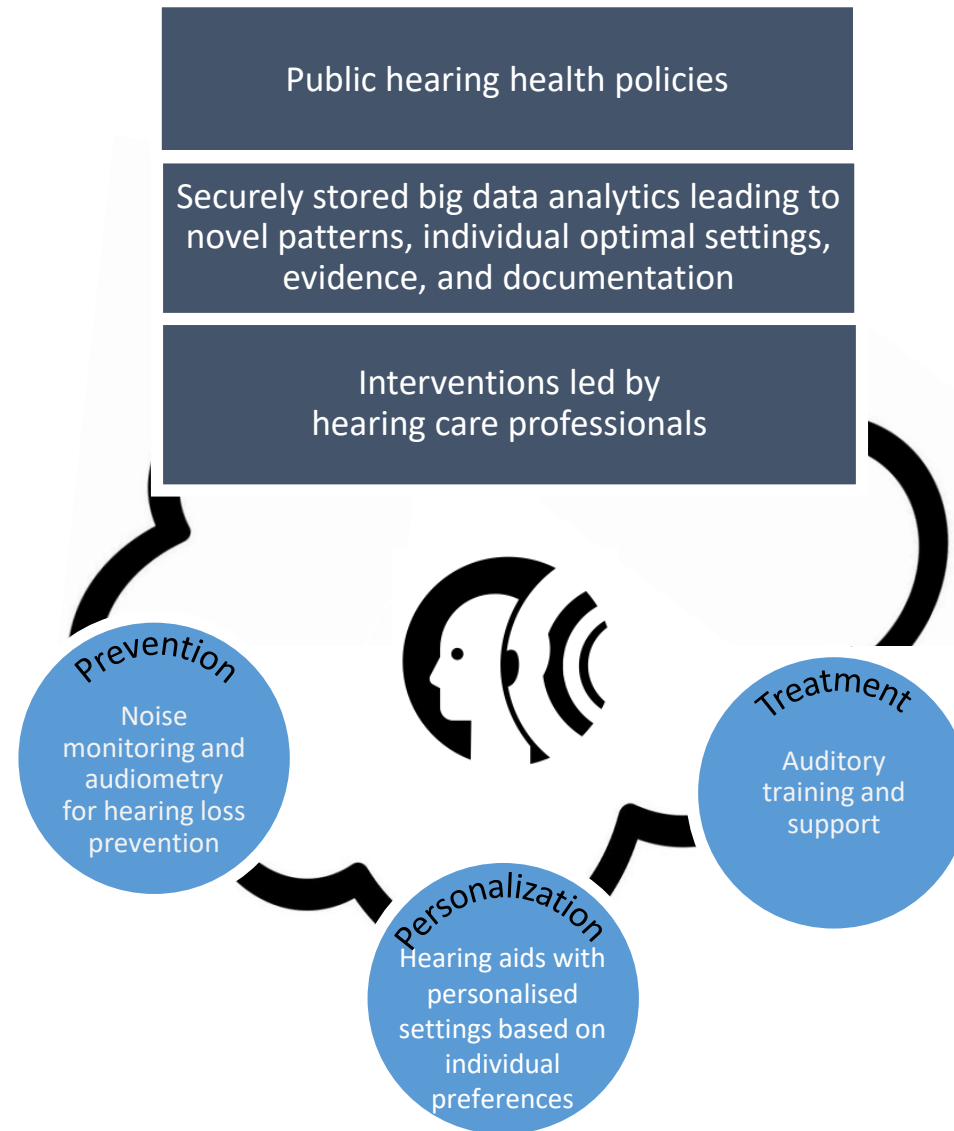
The combination of the novel EVOTION PHPDM Language (and associated tools) together with the platform's implementation in standard clinical pathways enables EVOTION to set a new standard for working with public hearing health policies based on big data.

# Socioeconomic and Wider Societal Impacts

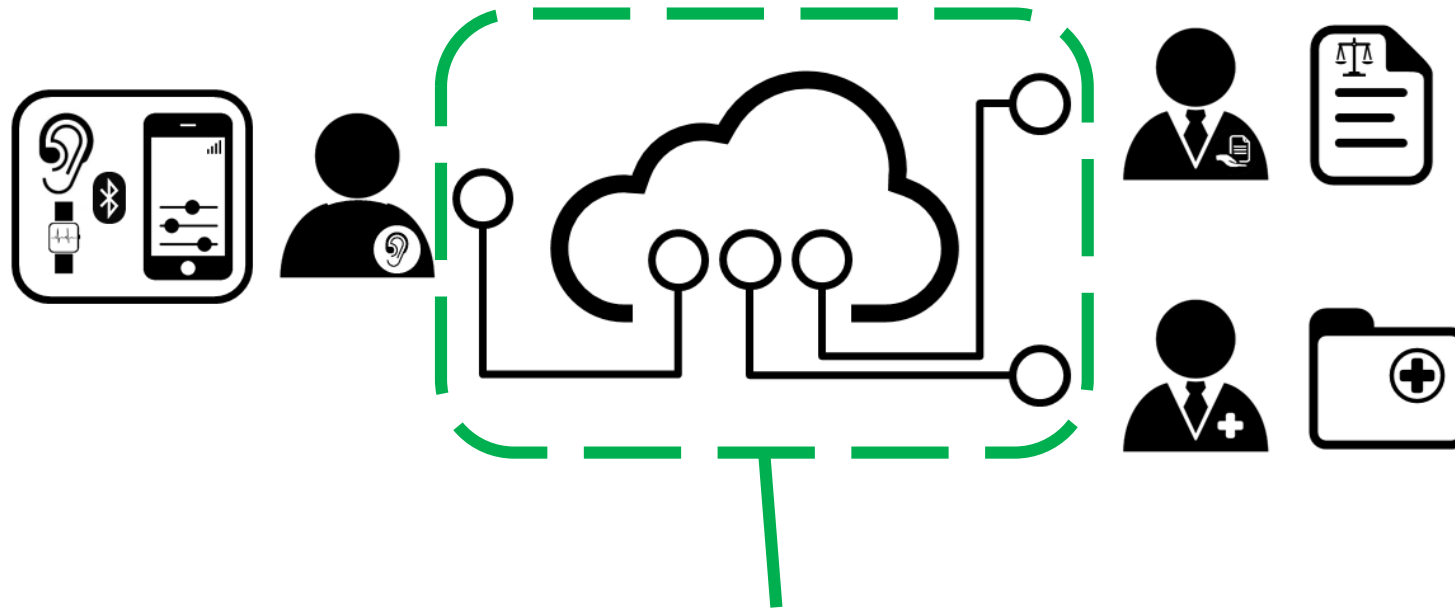
The socio-economic impact of hearing problems is currently undergoing intensive investigation as hearing problems become more widespread due to the increased life span, the effects of excessive noise, and increasing awareness of the size of the problem.

Moreover, as various health conditions compete for public funding, studies of treatment versus non-treatment in terms of cost, and personal health consequences (emerging from recent longitudinal studies), are gaining attention.

# Vision and Outlook

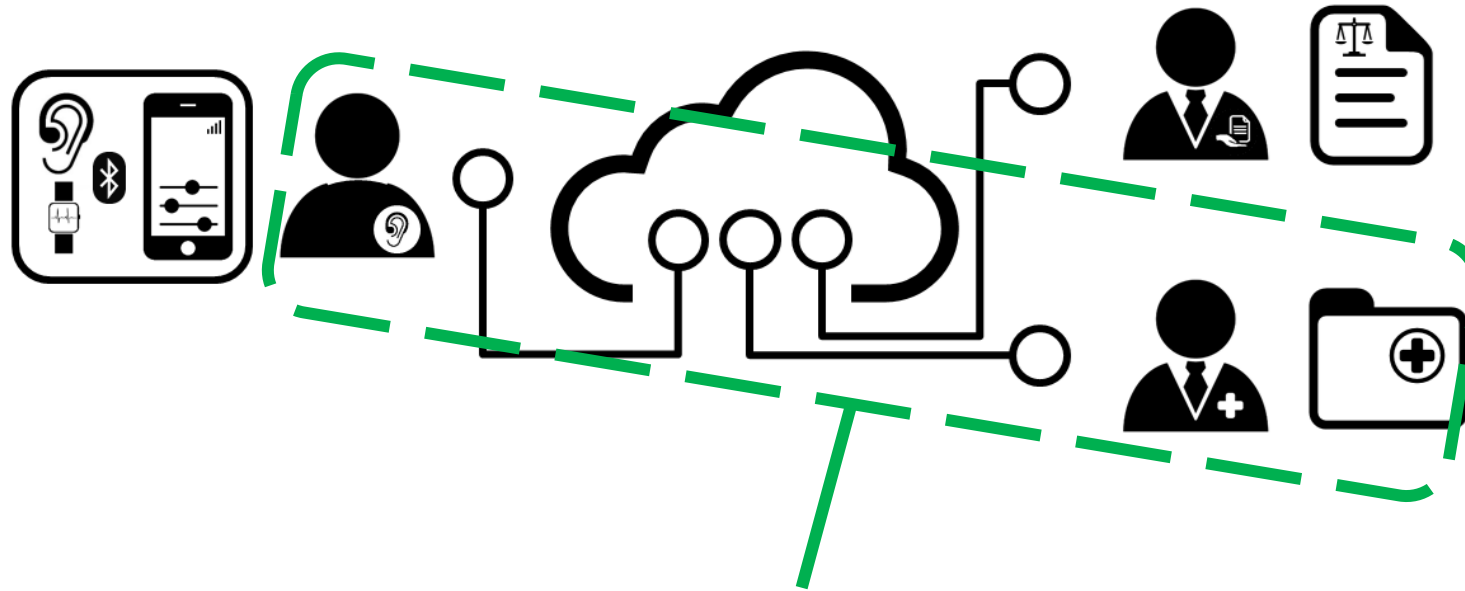


# Concluding Remarks



Enabling and combining heterogeneous streams of data and their subsequent big data analytics will help create ecologically valid evidence for the formulation and validation of public health policies

# Concluding Remarks



The ongoing clinical study collecting and feeding big data into the EVOTION data repository will enable the validation of the EVOTION platform, leading to patients' benefit via the development of new test/training material and tools that will be used beyond end of project



# Concluding Remarks



Therefore it will increase HL awareness stemming from the strong engagement of the several EVOTION stakeholders, including patients, clinicians and policymakers

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# Questions?

Thank you for your attention!