BIG DATA SUPPORTING PUBLIC HEARING HEALTH POLICIES

Samsung Galaxy A3:

• 4G LTE

20138 k 20138 k 20138 k 2013 k 2014 k

 \bigotimes

• Commercial smartphone

Bluetooth Low Energy

(((((((- - -)))))))

HEALTHCARE AND FUTURE HEARING AID REHABILITATION:

The 4 Ps

- PERSONALISED,
- PREDICTIVE,
- PREVENTIVE AND
- PARTICIPATORY

provides a platform to collect EVOTION heterogeneous data related to hearing loss



personalised

settings based on

individual

preferences

Medico Bazar, DTU, 7 MAR 2018

Johanna Gutenberg Niels Henrik Meedom Lukas Tietz Eriksholm Research Centre Oticon A/S, Denmark

A European Research Project Generating Big Data Evidence & Decision Support for Public Hearing Health Policies

EVIDENCE-INFORMED HEALTH POLICY



Concept and approach 1000+ Hearing aid users



- Bluetooth low-energy
- Uses custom Oticon fitting software







• Steps, Heart Rate, Pulse,

Respiratory Rate

Data Types

		Means of capture				
Generic Data Type	Specific Data Type	HA	Sensor	Mobile	Clin	
HA logging	Periods of HA usage	Х				

Big data analytics (BDA): Layers and components

BIG DATA ENGINE

ANALYTICS

DECISION

SIMULATION

New health policies: An older and more sick population Number of health conditions ■ 2 ■ 3 ■ 4 ■ 5 ■ 6 ■ 7 ■ 8 ■ 9 ■ ≥10 1990 2013 75-79 70-74 65-69 60-64 55-59 50-54 (Stead) 35-39 30-34 25-29 20-24 15-19 10-14

10 20 30 20 10 00 10 10 00 Male population Female population Male population Female population Population (millions) Population (millions) Vos et al 2015

New health policies: Tough choices ahead



NHS to begin denying people hearing aids for first time

forth Staffordshire clinical commissioning group takes unprecedented step



Deafness and hearing impairment

The NHS will start denying people with hearing problems access to hearing aids for the first time from Thursday in a controversial move that critics claim will orsen sufferers' social isolation

The GP-led NHS clinical commissioning group in North Staffordshire is taking the unprecedented step of ceasing to provide free hearing aids to mainly elderly people in its area with mild hearing loss.

O This article is 1 year old 9,965 471

	Use and adjustment of HA controls	Х			
TTS episode related	Predicted TTS values due to noise exposure and time required for recovery	Х		Х	
	Time of occurrence and severity of actual TTS	Х	Х	Х	
	episodes				
	Self-administered PTA at 4kHz			Х	
Audiological	PTA in quiet				Х
	Speech in Noise			Х	
	Reaction time (in Speech in Noise and Digit span tests)	Х		Х	
	Satisfaction with HA usage			Х	Х
Physiological	Heart rate		Х		
	Respiratory rate		Х		
	Pulse		Х		
Cognitive	Cognitive assessment				Х
	Digit recall test for auditory working memory			Х	
Mood and quality of	Mood and anxiety monitoring				Х
life	Quality of life				Х
Clinical and	Diabetes				Х
medication	Obesity				Х
	Family history of HL				Х
	History of medications				Х
	Duration of HL				Х
	Cause of HL				Х
Behavioural and	Watching television	Х		Х	
lifestyle	Participating in conversations and meetings	Х	Х		
	Rating of HA ease or difficulty to use			Х	
	Socioeconomic status				Х
Personal	Education level				Х
	Presence of significant others				Х
	Age				Х
	Gender				Х
	Personal carer				Х
Occupational	Employment history and current status (including				Х
	noise exposure)				





October 2017	October 2018	October 2019
Data collection	Platform can	Final platform
with EVOTION	suggest new	prototype can
hearing aids &	hearing aid	inform public
platform starts	settings	health policies



Denis Campbell Health It is also making it harder for those with moderate hearing loss to get access to policy editor hearing aids by introducing new eligibility criteria against which patients will be Thursday 1 October 2015 00.14 BST judged.

Agenda setting: Convergence of three streams



Goal: Better hearing health policies for all



Participatory and empowering care

	,				
Environmental	Location		Х	Х	
	Noise type, frequency spectrum and level	Х			
	Outdoor activities (e.g. conversations)	Х	Х		



This project has received funding from the European Website Union's Horizon 2020 research EU Gran and innovation programme under grant agreement No Duratior 727521

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	h2020EVOTION.eu
EU Grant	5 MIO EUR
Duration	1 NOV 2016 –31 OCT 2019 <u>info@h2020evotion.eu</u>



References:

Campbell, D. (2017). NHS to begin denying people hearing aids for first *time*. [online] the Guardian. Available at: https://www.theguardian.com/society/2015/oct/01/nhs-to-begin-denyingpeople-hearing-aids-for-first-time [Accessed 24 Nov. 2017]. Kingdon, J.W. and Thurber, J.A., 1984. *Agendas, alternatives, and public* policies (Vol. 45, pp. 165-169). Boston: Little, Brown. Vos, T., Flaxman, A.D., Naghavi, M., Lozano, R., Michaud, C., Ezzati, M., Shibuya, K., Salomon, J.A., Abdalla, S., Aboyans, V. and Abraham, J., 2013. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. The Lancet, 380(9859), pp.2163-2196. H2020evotion.eu. (2017). EVOTION – H2020 Research and Innovation Action. [online] Available at: http://h2020evotion.eu/ [Accessed 24 Nov. 2017].http://h2020evotion.eu/