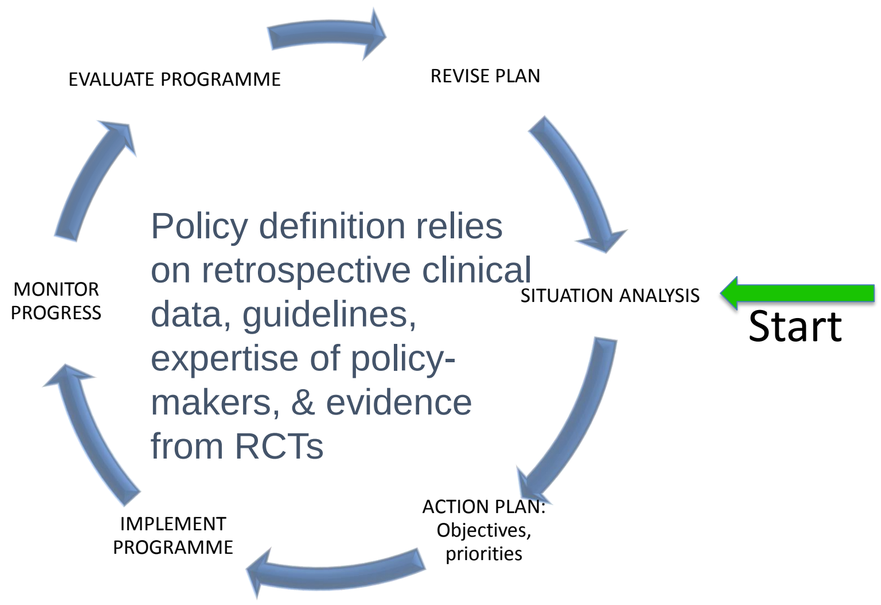
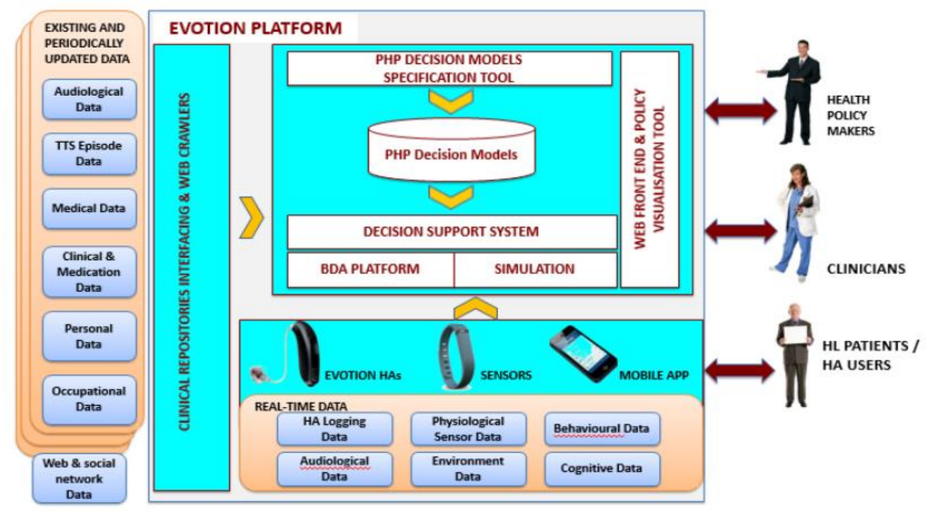
EVOTION

BIG DATA SUPPORTING PUBLIC HEARING HEALTH POLICIES

POSTER ON POLICY MAKING MODELS



The EVOTION Platform



EVOTION uses PHP decision-making models which define the data needed and ways it should be analyzed to produce the evidence required for PHP making, through an integrated platform.

CURRENT APPROACH TO POLICY MAKING

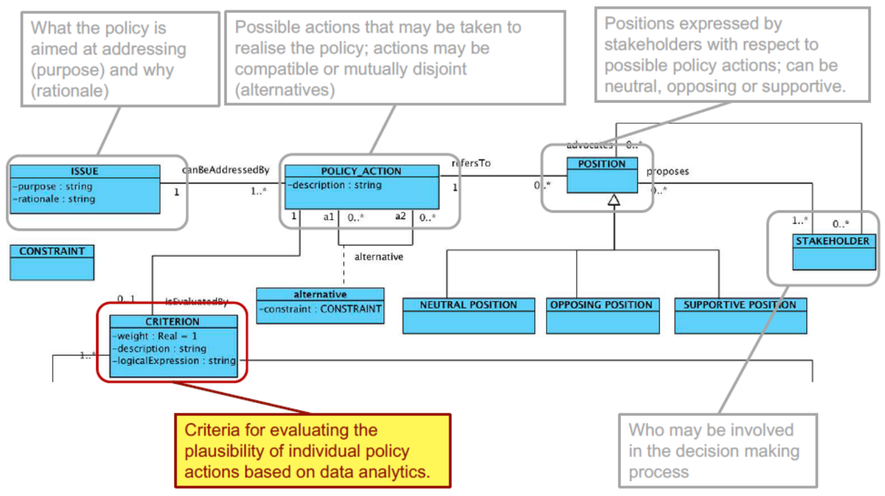
EVOTION Data

- **Hearing aid usage**, e.g., periods of HA usage (fine grain, not aggregate info), use and adjustment of HA controls
- **Physiological**, e.g., heart and respiratory rate, blood pressure, temperature, skin conductance, oxygenation
- **Cognitive**, e.g., verbal reaction time (as an index of listening effort and cognitive load), types of errors in auditory communication (mobile self-auditory tests)
- **Medical history data**
- **Personal,** e.g., educational level, socioeconomic background, presence of carers and/or significant others
- **Occupational, e.g.,** employment history, history of noise exposure
- **Behavioural and life style, e.g.,** indoor, outdoor activity
- **Environmental data, e.g.,** location, environment noise
- **Social media data,** e.g., reaction to/uptake of public health policy interventions

The PHPDM models specify-

- Generic issues that need to be addressed by PHPs and alternative decisions that may be made to address them
- Evidence that can support or provide counter indicators for decisions. (e.g.difficulties faced by different device users, cognitive capabilities, life style, co-morbidities, compliance with device usage guidelines etc)
- The BDA processes (specific types of statistical analysis or data mining) that should be followed for collecting and analysing evidence.
- Criteria that should be used to determine if available evidence is sufficient for making decisions; thresholds that would make evidence conclusive.
- The processes to be followed for making specific types of health policies. e.g. who are stakeholders, who makes final decisions, and whether decisions should be reviewed in light of new evidence.

Policy Making Process



Example: Overview

Using data analytics to explore whether the

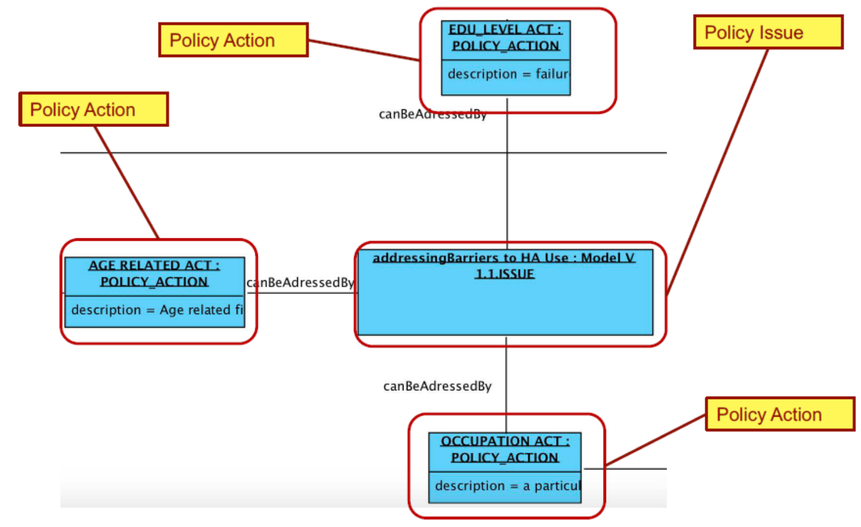
- Occupation
- Education level
- Age

of Hearing Aid users affects daily HA usage.

This is to inform policy making involving interventions, targeted to

- HA users of different occupations
- HA users of different education levels
- HA users of different age groups

Example: Policy Issue and Possible Actions



Example: Data Analytics

- Assuming the existence of data for the following variables:
  - Edu_Level (values: 1, 2, 3)
  - Age (values: [40,…, 100])
  - Occup (values: 1, 2, 3)
  - No of Has (values: 1, 2)
  - HA usage (average number of minutes per day)
- Execute different types of statistical analysis (e.g., regression, ANOVA) to explore the existence of effects

Other examples for possible models

(1) Prevention of cognitive decline

Existing Evidence:

- Mild (moderate) HL patients are twice or three times as likely to develop dementia as people without any HL (Schmulia et, 2015)

Analytics:

- Detection/characterization of HA users cognitive activity through analysis of cognitive data and correlation with level and type HL, clinical and medication data, physiological data and behavioural and life style data.

Interventions:

- Interventions aimed at enabling/increasing cognitive activity of HA users
- The form of such interventions can be shaped by identifying
  - challenging circumstances for cognitive activities of HA users
  - whether cognitive decline is more likely for HL patients with other long-term conditions obesity, hypertension or habits such as smoking

(2) GOAL: Introduction of better HL prevention strategies:

OBJECTIVE: Reduce public costs for compensation for functional disability resulting from HL

description:

- Provide evidence regarding the scale of the problem;
- Study data to elicit potential factors that may be used as predictors of functional disability resulting from HL;
- Identify circumstances under which compensation for functional disability is received by HA-users
- Inform the development of policy actions with regards to reducing compensation for functional disability resulting from HL

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