STOCHASTIC MODELS FOR BETTER DECISION MAKING

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K4H 2016 Conference

This presentation is part of the Joint Action JANPA (Grant agreement n°677063) which has received funding from the European Union’s Health Programme (2014-2020)
Evidence-informed public health

Public health issues:
• Involve many highly inter-related factors
• Operating at multiple levels in complex contexts
• Require different types of data & research

Public health data & trial-based evidence:
• Gaps
• Heterogeneous sources
• Small samples
• Uncertainties about generalisability

How do you make sense?
Stochastic models

Strengthening evidence base & data systems and making better use of these are priorities

But stochastic modelling is an approach (often the only one) that allows us to integrate diverse research & data

• Assumptions (explicit) fill data and research gaps
• Framework for developing research & data
• Make best use of available data and research

• Burden of Disease
• Cost of Illness
• Evaluation of trials (CEA)
Irish examples

- Recent decline in CVD deaths and relative contributions of prevention and treatment
- WHO (Europe) 53 Countries BoD studies
- Future disease burden of obesity (based on 2012 cost of adult obesity study)
- Recent WHO (Europe) obesity forecasts

Impact on public and policy debates is unquestionable and significant
1. In seven EU countries:
   – Describe lifetime impacts & cost of childhood obesity
   – Break these down by the year of occurrence
   – Assess effect of 1% & 5% reductions in childhood obesity rates

2. Assess generalisability to rest of EU

safefood project is an “advanced” JANPA WP4 study
Literature tells us that...

- Evidence linking childhood obesity & adult disease incomplete
- Many impacts & costs of childhood obesity occur much later in life
- Some/most obese adults were not obese children
- Not all adult obesity-related diseases are attributable to childhood obesity

What can you do?
Obesity-related treatment & deaths

Adjusted QOL measures & costs

Deaths from other causes

Costs of adult productivity losses

Adult productivity losses

Legend
- Forecast of (sex-age) population BMI distribution
- Individual BMI trajectory
Data & research requirements

- Population profiles & projections
- BMI forecasts (children & adults)
- Relative risks of obesity-related diseases
- Prevalence/incidence of obesity-related diseases
- Mortality
- Annual (total/per capita) healthcare costs – challenging!
- Incidence of other impacts (adult productivity losses)
- Cost of other impacts – challenging!
- Utility weights
Limitations

Data & research hungry:
- Extensive data & research imputation is often necessary

“Black box”
- Modelling assumptions often very technical
- Forecasts are often difficult to validate
- Economic perspective sometimes unclear or not relevant
- Mainly deal with chronic diseases

Some issues outside modelling
Beyond modelling

Important to develop:

• Longer term cohort studies
• Research and data
• Modelling methodology

At same time recognise that some issues outside modelling; eg

– Wider societal impacts
– Health inequalities
– Acute impacts
Caveat emptor: tips for consumers

- Demand transparency – assumptions, their limitations & implications (if necessary, get statistical advice)
- Be aware of the economic perspective used
- Is it relevant?

- Use them to identify evidence & data gaps and guide developments of research and data

- Think beyond modelling
THANK YOU. ANY QUESTIONS?

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