



Incorporating Health Economics into Grant Proposals

Health Economics Short Course

For more information and course dates, please visit our website: <http://go.unimelb.edu.au/i8ba>

Or email us: health-economics@unimelb.edu.au



COMMONWEALTH OF AUSTRALIA

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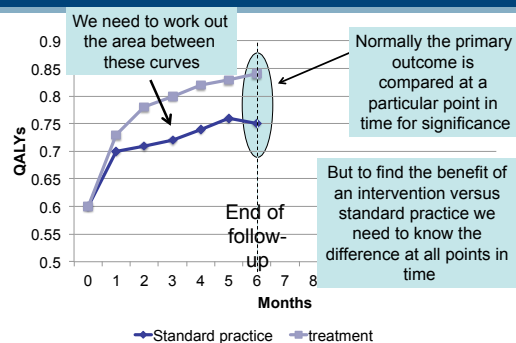
Modelling

Extrapolation and Modelling Longer Term Outcomes and Costs

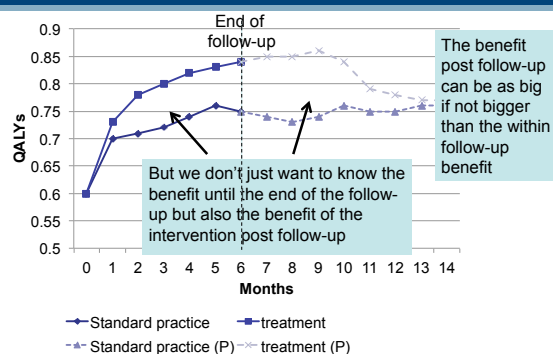
Centre for Health Policy
Melbourne School of Population and Global Health



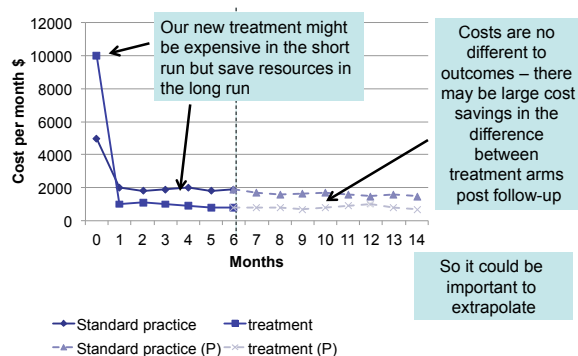
Extrapolation - Outcomes



Extrapolation - Outcomes



Extrapolation - Costs



Intervention to reduce youth binge drinking?

- QALYs in the short-term often do not change much
- Most of the health gains are unlikely to be seen for many years
- So there is a need to estimate/predict them
- We need to make sure we have a way to change short-term changes in risk factors into long-term changes in health
- Often if we are improving long-term health this also means we are reducing long-term health expenditure (or at least delaying this expenditure) and so modelling the long-term cost implications of this is also important to determine the most approach treatment decision

Modelling

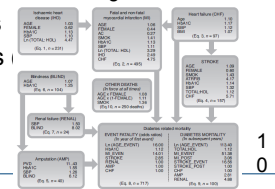
- Conceptually extrapolation into the future makes sense...
- ...similarly translating intermediate outcomes into final outcomes
- ...but how do we do it?
- Ideally we want to predict the differences between the new treatment and standard practice for both costs and outcomes until death (for a lifetime)

Modelling Outcomes

- Extrapolation
 - Parametric modelling of survival analysis
 - Regression modelling
 - 'Big data' predictive approaches
- Translate impact on intermediate outcomes into final outcomes using:
 - Estimates from the literature e.g. relative risks on morbidity (QALYs) and mortality
 - Information from other data sources e.g. registries or longitudinal studies
 - Microsimulation modelling – combine evidence from a range of sources to model life-course

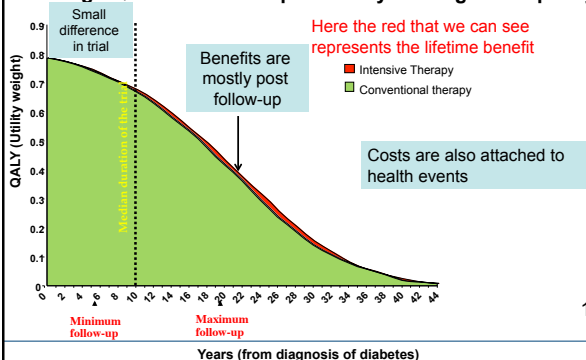
Modelling Outcomes

- Estimate QALYs for people with Type 2 diabetes, based on profile of complications of each patient over their remaining lifetime
- Use **UKPDS Outcomes Model** which is based on an integrated set of parametric proportional hazard models to predict absolute risk of first occurrence of seven major diabetes-related complications, using:
 - patients' characteristics
 - time varying risk factors



Simulating lifetime outcomes

Average QALY for UKPDS patients by blood glucose policy



Modelling Costs

- Often costs may be driven by health outcomes
 - once we have extrapolated outcomes we can link this to costs e.g. cost of a CVD event such as a stroke
- Observational data sets are also very useful to estimate the resource implications of particular health outcomes
 - predict the costs (healthcare utilisation) associated with different stages of COPD using routinely collected data sources
- Recruit an observational sample of those treated in the past (using standard practice) to better understand future cost (& health) implications of the disease

- Modelling into the unknown often means that there is considerable uncertainty (so we need to make sure we capture and present this)
- But not predicting into the future means that we have biased estimates and we are simply ignoring this uncertainty in terms of benefits & costs
- So when we are designing a study we need to think about data which are going to help us predict into the future