Existing Whole Disease Models (WDMs)

- How many?
- Disease areas?
- Quality?
- Applications?
A systematic review of whole disease models and pathway models for any disease areas

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A model which evaluates multiple (≥3) decision points for
• people at risk who may, or may not, go on to develop a given disease 
  AND 
• people with the given disease

A model which evaluates multiple (≥3) decision points for
• people at risk who may, or may not, go on to develop a given disease 
  OR 
• people with the given disease

Note
1. A model was assessed as meeting the criteria of a WDM/pathway model either by demonstration or based on authors’ reporting.
Fig 1. Total number of WDMs by year
Characteristics of WDMs

92% 

3% 

84% Serious limitations*

1) Inadequate model structure
2) Failure to consider adverse events of interventions
3) Lack of probabilistic sensitivity analysis (PSA)

* Assessed by the NICE appraisal checklist for economic evaluations.
Top 5 Disease areas

1. Heart disease (27%)
2. Cancer (15%)
3. AIDS (10%)
4. COPD (7%)
5. Metabolic disease (7%)
Case study 1 – Coronary Heart Disease (CHD) policy model

(Weinstein et al. 1987)

Used for 33 years

Adapted to Argentina, Canada, China, and Mexico.

1. Cost-effectiveness analysis
2. Inform clinical guidelines
3. Evaluate health policies
Case study 2 – United Kingdom Prospective Diabetes Study (UKPDS) model

(Clarke et al. 2004; Hayes et al. 2013)

Used for **18 years**

30 **years of follow-up**

1. Cost-effectiveness analysis
2. Inform clinical guidelines
3. Predict life expectancy
4. Inform the design of clinical trials
Key Points for Decision Makers

1) There has been an **increase in the number of WDMs since 2005**.

2) The main disease areas covered by existing WDMs are **heart disease, cancer, AIDS, COPD, and metabolic disease**.

3) The majority of WDMs were of **poor quality** which means they may **require significant modification** before they can be re-used.

4) With routine maintenance and regular updates, a WDM can be **re-used for many years** to consider other decision problems or to incorporate new evidence.

Do you agree with the following statement?

> In the long-term, the benefits of using WDMs are likely to outweigh the initial investment of time and money.

- **Agree**: 👍 *(thumbsup)*
- **Disagree**: 👎 *(thumbsdown)*
- **Unsure**: 😕 *(confused)*

