Background note 3

Modelling the Endgame for rheumatic heart disease

Models of disease progression use epidemiological data to describe the likelihood of various health outcomes based on risk factors at the individual or population level. These risk factors can be modified by implementing prevention strategies.

Therefore, disease progression models make it possible to estimate population outcomes from rheumatic heart disease (RHD) and the impact of prevention strategies. Although there is often uncertainty in outcomes from modelling, which are addressed by sensitivity analyses, it has the advantages of being quicker and less costly to evaluate and determine the optimal strategies compared to evaluating them under clinical trials, thereby facilitating quicker implementation and action in communities.

Disease models can also be combined with economic information to estimate the cost of different prevention strategies and to explore their cost-savings or cost-effectiveness. This information can help to compare the trade-off between economic and health outcomes from a set of options and identify the strategy that provides the best outcomes for the funding available.

The RHD Endgame Strategy will use a disease model to describe the progression between Strep A infection, acute rheumatic fever (ARF) and RHD, and the current health and economic burden at each stage of disease in Australia. Existing data will be used to estimate the probability of a person acquiring a Strep A infection, developing ARF, and progression to RHD and later complications. Further, a range of data sources will be used to estimate the effect of different strategies in modifying individual and/or population risk factors, reducing the probability of disease progression. The estimated reduction in health and economic burden for each prevention strategy will be contrasted against their cost of implementation to determine cost-savings or cost-effectiveness, and uncertainty in these outcomes will be explored through sensitivity analyses by varying the change in probability of progression within a plausible range.

Example of modelling