

## Evidence and information for health policy: a decade of change

*Burden-of-disease and cost-effectiveness studies will help us realise better population health*

OVER THE PAST DECADE OR SO, there has been increasing demand for greater clarity about the major causes of disease and injury, how these differentially affect populations, and how they are changing. In part, this demand has been motivated by resource constraints and a realisation that better health is possible with more informed allocation of resources. At the same time, there has been a change in the way population health and its determinants are quantified, with a much closer integration of the quantitative population sciences (such as epidemiology, demography and health economics) to strengthen and broaden the evidence base for healthcare policy.

The first coordinated efforts to provide more relevant and comprehensive data on the health (as opposed to survival) of populations and on specific strategies for disease control were led by the World Bank, culminating in two seminal reports in 1993 on the state of global health and priorities for improving it.<sup>1,2</sup> These reports have subsequently had a great influence on debates about health sector priorities and healthcare research needs. A fundamental outcome of this World Bank research has been a change in the paradigm for health accounting, from measuring death to measuring population health, using a single summary index that simultaneously incorporates information about age at death and the incidence and prevalence of disease and injury. A time-based metric, the disability-adjusted life-year (DALY), was used to capture both fatal and non-fatal health outcomes affecting populations. DALYs for over 100 specific diseases and injuries have been assessed within a "burden-of-disease" framework which constrains individual estimates and preserves epidemiological plausibility.<sup>3,4</sup> The burden-of-disease approach gives estimates of DALYs from risk factors (eg, smoking) as well as diseases caused by known risk factors (eg, ischaemic heart disease related to smoking) and from other, unrelated conditions (eg, road traffic accidents, which have nothing to do with smoking).<sup>5</sup> Thus, a single metric (the DALY) can be used to compare disease burden across a range of diseases, injuries and risk factors.

Certainly, the data and information requirements for adequate measurements of the burden of disease in a population are not inconsiderable. They need information on age at death and cause of death, the age-specific incidence of disease and injury, the typical duration of life lived with the sequelae of diseases and injuries, and some quantification of the severity of disability assessed according to a commonly agreed framework. The ethical, philosophical and conceptual issues involved in quantifying states of health other than perfect health are still very much a matter of debate, and rightly so.<sup>6</sup> However, the reliability, and hence the utility, of burden-of-disease studies for public policy depend much more strongly on the quality and availability of the underlying epidemiological data.

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A principal advantage of the burden-of-disease approach is that it entails a data "audit", whereby the completeness, reliability and consistency of routinely collected data are assessed, and critical gaps in health data collection are identified. One implication is that periodic quality assessments of, say, routine cause-of-death data ought to be carried out to ensure their continued relevance and reliability for public policy. Another might be the need for a more rational assessment of priority data for the healthcare sector, placing greater emphasis on data collection and data linkage to facilitate burden-of-disease studies, rather than on routine collection of statistics of limited public health relevance. The burden-of-disease framework, based on the estimated epidemiological path of incident cases, would benefit greatly from wider availability of linked data sets on health outcomes and further research into health-state transition probabilities (ie, the probability that patients with a given illness or disability will get better or worse, and the severity of their current compared with their previous health state) from longitudinal studies.<sup>7</sup>

In parallel with the increased emphasis on more reliable and comprehensive assessment of population health, there has been a rapid expansion in knowledge about the cost-effectiveness of interventions for reducing the burden of disease. Packages of interventions to optimise health in populations at different levels of development were among the major research outcomes of the *World development report 1993*.<sup>1</sup> Subsequent work by the World Health Organization identified evidence of cost-effectiveness as a key health research priority worldwide.<sup>8</sup> The findings of a large international study of the cost-effectiveness of 170 interventions, primarily to reduce health hazards from unsafe water and hygiene, childhood undernutrition, tobacco use, unsafe sex, and high blood pressure and blood lipid levels were recently reported by WHO.<sup>9</sup> The evidence base for setting health priorities is thus rapidly expanding. Yet, as the WHO report points out, there is still a large potential for realising better health through more informed and systematic application of this knowledge.<sup>9</sup>

As demand for healthcare grows, decisions about resource allocation and priorities for the healthcare sector will fall under increasing scrutiny. This is likely to lead to demands for more reliable and useful evidence about population health problems, and for affordable and effective measures to address them. Australian researchers have been at the forefront of these international developments, and have carried out local burden-of-disease studies that have been used to support policy development by the federal and state governments, particularly in Victoria.<sup>10,11</sup> Australia is also well placed to provide technical support to neighbouring countries that are undertaking burden-of-disease and cost-effectiveness research to improve the efficiency of their healthcare systems.

More than 5 years have now passed since the first Australian burden-of-disease study was undertaken, and much could be gained from a renewed appraisal of Australian healthcare information based on the methodological advances in burden-of-disease measurement in the interim. The School of Population Health at the University of Queensland has established a Centre for Burden of Disease and Global Health Research which has a mission to provide the technical and strategic leadership for priority-setting research in Australia and the entire Asia-Pacific region.

Strong links to WHO, the World Bank, the National Institutes of Health in the United States, and other leading health research institutions worldwide, will ensure that efforts to improve the evidence base for healthcare reflect global advances in health research and development.

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