

How summary measures of population health are affecting health agendas

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Summary measures of population health (SMPH) combine information on mortality and non-fatal health outcomes to represent the health of a particular population in a single numerical index (1). Traditionally, mortality statistics have been the solid basis of population health measures. They still are, but as preventive and curative health care became more effective at modifying disease patterns, morbidity became an indispensable population health indicator, especially in low-mortality populations. Thus, since the 1960s there have been efforts to develop measures that combine both types of information.

This has opened up a vast new research domain. Whereas mortality can be measured in a straightforward way and occurs only once for each individual, the statistics involved are also relatively straightforward. For non-fatal health outcomes the opposite is the case. There is a nearly infinite variety in definition and measurement of such outcomes, each person will experience several of them during their lifetime, and there are many different ways to aggregate such information.

The publication of the Global Burden of Disease study by the World Bank in 1993 was a landmark event in the SMPH debate (2). For the first time, mortality and morbidity statistics for the world population were combined into one single summary measure for maximum comparability. The unit of measurement devised for this purpose was the disability-adjusted life year (DALY). The publication of this study stirred up a lively debate on the methodological and ethical aspects of SMPH.

The most important issues are: first, the selection of health domains and the measurement of health indicators within those domains; second, the calculation of health expectancies such as "healthy life expectancy", or rather health gaps, such as DALYs, where the present population health is compared to a certain standard; and third, the valuation of health states. Other issues concern the epidemiological approach (incidence versus prevalence measures) and whether generic or disease-

specific disability information should be included.

Most of these issues have ethical implications, and summary measures have also stirred up a lively debate on empirical ethics. Choices in the construction of SMPH implicitly or explicitly reflect underlying preferences. For health gap measures, such as DALYs, which express the burden of disease as a loss of health with respect to a certain norm for population health, the choice of that norm value implies the health target for that population. Health inequalities may to a greater or lesser extent be reflected in a summary measure. Preferences for investing in health in younger versus older age groups may be included in SMPH by applying age weights.

Although in practice the weakest area in SMPH at the moment is the availability of reliable and comparable data on disease and disability, the choice of weights to relate disease and disability with mortality has probably caused the most heated debate. The main issues concern whose values should be used (those of patients, professionals or the general public, and as seen globally or locally) and the valuation method to be used. Valuation methods differ with respect to the magnitude of the resulting weights. These will determine how much a specific summary measure will accentuate the importance of morbidity and disability relative to mortality. Fortunately, however, the available empirical data show that the ranking of most diseases and health states does not greatly vary between populations and cultures. Thus, in practice in the calculation of SMPH, sets of disability weights can easily be replaced, depending on the purpose of a specific SMPH.

SMPH have a wide range of applications. They can be used to compare the health of populations, to describe the changes in health of a certain population over time, and to describe the distribution of health within populations. In order to make such descriptive applications useful, the paramount requirement is that the measurement of the constituent parts of the SMPH is standardized and stable between countries and over time. A

second type of application is the assessment of the relative contributions of different diseases, injuries and risk factors to overall population health. *The world health report 2002* is a good example of such an application (3). The ultimate goal of SMPH is to support policy decisions in the allocation of resources for prevention, health care and research. For such priority setting, information on the relative size of health problems and risk factors is an indispensable part of the evidence needed.

WHO's publication on the "concepts, ethics, measurement and applications" of SMPH reflects the fact that nowadays, few will doubt whether summary measures of population health belong to the core methods of health statistics (4). They are widely used for all the purposes mentioned above. The debate is not any more whether SMPH are useful, but which ones are useful for a given purpose. There is obviously no "one size fits all" solution for the development and application of these measures. Neither will summary measures ever replace more detailed reporting of health data.

Perhaps the most important contribution of this methodology is not the end product, the summary measures themselves, but the way they force us to define the exact epidemiological input needed regarding mortality and disability. In doing this they promote the application of uniform classifications and the collection of missing information, calling for systematic checking of the internal consistency of epidemiological information on specific diseases. Thus, apart from their role in setting health care and research agendas, they also set agendas for international comparative data collection and epidemiological research. ■

1. Field MJ, Gold MR, editors. *Summarizing population health: directions for the development and application of population metrics*. Washington (DC): National Academy Press; 1998.
2. The World Bank. *Investing in health*. Oxford: Oxford University Press; 1993.
3. *The world health report 2002: reducing risks, promoting healthy life*. Geneva: World Health Organization; 2002.
4. Murray CJL, Solomon JA, Mathers CD, Lopez AD editors. (2002) *Summary measures of population health — concepts, ethics, measurement and applications*. Geneva: World Health Organization; 2002.

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