Cancer transition and priorities for cancer control

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In *The Lancet Oncology*, Freddie Bray and colleagues 1 assess worldwide patterns of cancer burden, in terms of both incidence and mortality, and predict future scenarios in relation to different levels of socioeconomic development, which they measure using the Human Development Index (HDI). Their paper, which provides a good explanation of the theory of cancer transition, serves both purposes of research and guidance in setting priorities for cancer control.

Cancer transition can be regarded as an extension or completion of Omran's theory on epidemiological transition.2 and 3 In analogy with the third stage of epidemiological transition—a shift from infectious to non-communicable diseases—the theory of cancer transition sees a shift from a predominance of cancers linked to infections to cancers associated with risk factors that are mainly non-infectious and possibly related to a so-called western lifestyle. So, whereas in very high and high HDI areas four cancer types (lung, female breast, colorectum, and prostate) account for almost half the total cancer incidence burden, in middle and low HDI areas, in addition to cancers of the lung, colorectum, and female breast, cancers of the stomach, liver, and cervix account for a substantial burden of cancer.1 In areas with low HDI, the most frequent cancer types seem to be those of the cervix, female breast, liver, Kaposi's sarcoma, and non-Hodgkin lymphoma.1

Bray and colleagues' findings1 show that, in 2008, the largest cancer burden was in very high HDI areas, which bore almost 40% of the global incidence burden despite accounting for only 15% of the world's population; low HDI areas bore only 2% of the burden, with a population accounting for nearly 6% of the global population. However, Bray and colleagues' projections for 2030 predict the largest absolute increase in low HDI areas. And the proportion of the global burden of cancer borne in low HDI areas might be higher if only the population older than 50 years are considered—people in this age group are most susceptible to cancer and are likely to account for a smaller proportion of the national population in low HDI countries. Furthermore, with respect to projected burdens, the socioeconomic level in low HDI countries is expected to improve (as implicit in the demographic projections that assume decreasing population growth), which will in turn increase the incidence of cancer because of both population ageing and the spread of new risk factors. For these reasons, cancer burden in lower HDI areas will probably become a more serious problem in the future than it seems now.

The analysis of cancer burden and trends together with future projections shows where different populations stand along the epidemic curve and might help to identify the most useful interventions.

The knowledge gained in areas where more advanced stages of cancer transition have been reached is crucial to guide implementation of preventive action in those that still lag behind.

In the theory of epidemiological transition,3 the shift from infections to degenerative diseases in Europe was not associated with progress in medical science but rather with improved socioeconomic conditions (that in turn improved nutrition and hygiene).4 Medical progress became more important at a later stage in high-income countries, but was seen to have a great effect in low-income countries, causing accelerated epidemiological transitions. Should the analogy with Omran's theory hold, implementation of preventive measures to eradicate known risk factors in low and middle HDI countries could be most effective and could change the shape of the cancer epidemiological curve for most of the world's population (more than 70% putting together middle and low HDI countries). Public health programmes should include campaigns for immunisation,5 tobacco control, reduction in alcohol consumption and obesity,6 and the implementation of cancer-screening programmes that have been shown to reduce mortality effectively.7

In very high HDI areas, there is strong evidence of the simultaneous start of decline of lung cancer incidence,8 at least in men, and the rise and increasing relative importance of other cancer types (eg, kidney, pancreas,8 testis9), often with unknown cause or known risk factors that explain only a small fraction of cases. In such areas, which are at the front edge of the cancer epidemic curve, has cancer transition theory been fully realised or has a new epidemic stage—a shift to other cancer types related to risk factors that are still unknown—become apparent? The answer and the possible strategies to counteract the rise of new diseases depend entirely on our ability to understand the patterns of their emergence and identify their causes.

We declare that we have no conflicts of interest.

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