Commentary: The global health multiplier: targeting common social causes of infectious and non-communicable diseases

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In this issue, Remais et al. renew earlier challenges to the ‘false dichotomy’ that has emerged between non-communicable diseases (NCDs) and infectious disease in low- and middle-income countries (LMICs) that are now facing a ‘double burden’ of disease. Although they note that the role played by social change, such as rural-to-urban migration, their focus is primarily upon the biological mechanisms accounting for the associations of NCDs and infectious diseases. For example, diabetes and tobacco smoking increase susceptibility to tuberculosis (TB), and about one in three cancers has infectious origins. Remais et al. make sensible recommendations about the need for improved surveillance, more effective prevention, and better co-ordination of clinical care for NCDs and infectious diseases. However, it will also be necessary to look upstream to tackle the social determinants that are driving both groups of conditions. The long-established social determinants of infectious diseases, such as inadequate housing, poor nutrition, and poverty, also increase the risks for chronic diseases.

An optimal public health response will target all of these common causes, with investment in what we term ‘global health multipliers’, or interventions that address the causes underlying both infectious and NCDs. The rationale for this term is that by addressing these common social causes, governments can multiply the return on their investment in interventions.

How potentially significant are these common causes? Using the World Health Organization (WHO) Global Burden of Disease data for 2009 (covering 190 countries, excluding the two outliers of war-torn Afghanistan and Zimbabwe, which have the highest death rates in the world from infectious diseases), we find that there is a moderate and significant correlation of age-standardised infectious and chronic diseases ($r_{mortality} = 0.53$, $P < 0.001$; $r_{daly} = 0.54$, $P < 0.001$) (Figure 1).

When this correlation is quantified, each reduction of 100 infectious disease deaths per 100 000 population is associated with a ‘multiplicative impact’ of reducing chronic disease deaths by 26.2 per 100 000. Similarly, each reduction of NCD deaths per 100 000...
by 100 correlates with a further reduction of about 69.9 deaths per 100 000 (data not shown).

Although we cannot here disentangle the directions of these effects, these correlations, and the evidence for causal linkages in NCDs reducing infectious diseases and vice-versa, suggest that approximately a quarter of the variation in infectious diseases and NCDs across populations could be linked to common underlying causes of the two types of conditions. One obvious cause is national income. If adjustment is made for GDP per capita, the association of infectious diseases and NCDs diminishes by about 60% (Table 1).3

With the understanding that it is not income per se that is important, but rather what is done with it, we are led to global health multipliers. What are they? We can identify at least four plausible candidates from the literature: food, housing, employment, and healthcare:

(i) Food and nutrition policy: weaknesses in the food supply chain have implications for infectious disease, e.g. by compromising the immune response to malaria, and for NCD, with the expansion of energy-dense junk food outlets in LMICs.4

(ii) Housing policy: poor quality housing, such as that found in urban slums where water for domestic consumption is stored in open containers, provides breeding opportunities for the insect vectors of malaria and dengue,5 while inadequate cooking arrangements lead to indoor air pollution and thus to chronic airways disease6 and increased risk of TB.7

(iii) Employment: paid work is among the most important strategies for alleviating poverty,8 with higher incomes associated with greater resilience to infections such as TB, as well as to healthier diets (when accompanied by effective food policies).

(iv) Provision of health care: inadequate access to care leads to the late presentation of disease,
with complications, such as those of diabetes, and facilitates irregular treatment, leading to antibiotic resistance and the enhanced transmission of infectious diseases.

Nonetheless, although it is very likely that investment in these potential multipliers will have an impact on both categories of disease, the true impact is unknown, largely because most research has examined the contribution of social determinants to either infectious disease or NCD, but not both. Practical solutions are needed to act on the joint risks of these disease categories. Considerable effort has been given to finding the biological mechanisms involved in their occurrence and transmission. Now the priority is to understand and address their avoidable social causes.

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References