

technology: access to safe drinking water, effective sanitation, safe housing, adequate nutrition (especially for women and children) and universal education. Furthermore, local health service research in low-income countries would greatly assist these countries to expand application of their current arsenal of effective health care interventions. Yes, developing countries have been neglected in terms of biomedical and clinical research into infectious diseases, but the technical knowledge needed to improved population health in developing countries already exists.

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We applaud the recent informal assessment of the potential health and economic benefits that might flow from an accelerated program of research to combat global infectious diseases.¹ The policies adopted for the organization and prioritization of health research should themselves, wherever possible, be evidence-based.² However, many conceptual and empirical obstacles face those attempting retrospective analyses of economic benefits from spe-

cific programs of health research; in particular, it is necessary to take full account of the cost of the contributing research and of its application, and to then assess the value of the incremental health and other benefits that follow.³

The proposal from the Global Infectious Disease Evidence and Analyses (Global IDEA) network¹ refers to work from the United States on the economic benefits of health research⁴ that is rightly receiving considerable attention. In assessing returns in the context of the global debate about infectious diseases, however, one obvious problem is the value placed on the health gain. The US study valued the life of a US citizen at about \$3 million but even if that is the appropriate value to use in the US context, it is improbable that such a figure would be applied rationally by decision-makers in other countries.

The Global IDEA Scientific Advisory Committee also argues that if \$2 billion is spent over 10 years for research on new tools that lead to a 5% increase in lives saved, this could, using figures from the important report from the Commission on Macroeconomics and Health,⁵ result in annual returns of about \$9 billion. We suggest that, in estimating the real return, it is essential to allow for the (possibly very substantial) costs of applying any new tools or technologies that result from the research.³

More work is needed to refine the methods for analyzing the payback from investments in health research. Initiatives such as the program proposed by Global IDEA might then be supported with firmer evidence of their possible benefit.

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[Five members of the Global IDEA Scientific Advisory Committee respond to Dr. Moore and colleagues:]

Health determinants are not necessarily health interventions. Interventions need to be practicable (i.e., widespread use is possible) and affordable. We agree with David Moore and his colleagues that universal primary education has social returns beyond its impact on child and maternal survival. However, safe housing, sanitation and food subsidies are more costly and less practicable than are public health interventions.¹

As we have recently reviewed,² research and the diffusion of knowledge have improved public health interventions (which differ from the more narrowly defined "medical" interventions), making them more efficacious and cheaper, which means that they are more cost-effective. Thus, mortality fell more rapidly in the 20th century than it fell in the 19th century. Access to vaccination and treatment of respiratory infections and diarrhea explain more of the decline in child mortality in India since 1975 than do differences in income growth or education.^{3,4} In rural Senegal, recent mortality decline can be traced to specific interventions, even in the absence of universal safe water, sanitation or housing.⁵ Smoking controls and changes in saturated fat intake have decreased adult mortality in Poland.⁶ (Declines in mortality due to tuberculosis before 1950 are a riddle. Although these declines were not due to antimicrobials, it is unclear if better living standards were responsible. Less well studied cofactors for tuberculosis may well have played a role.)

Interventions based on "egalitarian