

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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**W**e 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.<sup>1</sup> The policies adopted for the organization and prioritization of health research should themselves, wherever possible, be evidence-based.<sup>2</sup> 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.<sup>3</sup>

The proposal from the Global Infectious Disease Evidence and Analyses (Global IDEA) network<sup>1</sup> refers to work from the United States on the economic benefits of health research<sup>4</sup> 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,<sup>5</sup> 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.<sup>3</sup>

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:]

**H**ealth 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.<sup>1</sup>

As we have recently reviewed,<sup>2</sup> 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.<sup>3,4</sup> In rural Senegal, recent mortality decline can be traced to specific interventions, even in the absence of universal safe water, sanitation or housing.<sup>5</sup> Smoking controls and changes in saturated fat intake have decreased adult mortality in Poland.<sup>6</sup> (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

principles” or “social determinants of health” strike us as romantic but impracticable notions. To quote Kingsley Davis from 1956,<sup>8</sup>

[It] seems clear that the great reduction of mortality in underdeveloped areas since 1940 has been brought about mainly by the discovery of new methods of disease treatment applicable at reasonable cost [and] by the diffusion of these new methods ... The reduction could be rapid because it did not depend on general economic development or social modernization ... Though in the literature on public health there is still great lip service paid to the necessity of general economic improvement and community welfare in the control of disease, the truth is that many scourges can be stamped out with none of this...

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## The study of NOELs

As a member of the Biological Lecturers of Western Ontario (BLOW), I must respond to the study by Kenneth Rockwood and colleagues.<sup>1</sup>

I was frankly appalled at the aspersions cast upon the venerable tweed jacket. I can state categorically that while lecturing over many years, I have observed frequent NOELs (nod-off episodes per lecture) in my classes — whether or not I was wearing tweed! Nor should the authors seek to discredit our little friends, the insect-like creatures (ILC), who so nobly inhabit our tweed vestments.

The authors know (or ought to know) that there have been no well-defined, published studies (single-, 1½- or double-blinded) linking ILC dander to cerebral dysfunction. In fact, I am aware of a preliminary report (personal communication) using an innovative “triple-blinded” study design (both researchers and subjects were blinded, while the ILCs were fitted with bilateral, opaque compound-eye patches) that suggests for the first time that the dander is actually linked to vasodilatation in the basal ganglia, corpus callosum and elbows of those exposed. The implication for the study of upper-extremity, crossover movement disorders in tweed-wearing BLOWs is, of course, enormous.

Blame for NOELs should be placed squarely where it belongs: on the backs (or more precisely, on the back of the necks) of those in our audiences who persist in nodding off.

My own personal theory is that this tendency is actually due to hyperactive stretch reflexes (HSR) in the posterior paracervical musculature (PCM) of those in the medical community who are given to nodding off. Therefore, rather than sacrificing BLOWs or ILCs, it

might be far more beneficial to sacrifice a few of the more compulsive noddors among our medical students — perhaps circumventing the thorny issue of ethical approval. Information thus obtained might allow the scientific evaluation of the twitch capabilities (TC) of the affected posterior muscle spindles (PMS).

Establishing the appropriate control group for this study will of course be critical. I agree with Rockwood and colleagues that it would be most appropriate to use as control subjects physician-blaming noddors. Perhaps a prospective, longitudinal trial should be undertaken to determine whether administrators, politicians or lawyers would be best suited. Ideally this study would last for 20 years or more; if well publicized, it could have the added benefit of reducing the frequency of nodding off within those groups. Yet such an outcome may be pure fantasy if the protocol fails to distinguish between simple noddors and those administrators and politicians who can sleep with open eyes and still heads (OESH). Under these circumstances any available data would be classed as superficial, unnecessary clinical knowledge (SUCK).

Finally, funding for such a trial could be pursued through the Canadian Medical Protective Association — at arms' length of course, lest any of the associated tweed-wearing lawyers (TWL) also demonstrate upper-extremity, crossover movement disorders during their closing arguments.

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Kenneth Rockwood and colleagues<sup>1</sup> are to be congratulated for highlighting the problem of nodding off during scientific sessions, an unfortunate condition common among doctors