



Health Consequences of Declining Incomes

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In Reply: We thank Dr Fox and colleagues for bringing attention to several key issues related to our systematic review and for their clarification of points relating to the management of neglected tropical diseases.

We regret any confusion related to the terminology in our review. Although the terms *elephantiasis* and *lymphatic filariasis* are sometimes used interchangeably,¹ this practice should be avoided. Filariasis refers to infection with nematode worms (such as *Wuchereria bancrofti*) transmitted by mosquitoes. Elephantiasis represents only 1 severe manifestation of lymphatic filariasis. We agree with the need for RCTs evaluating filariasis treatment to include prespecified standardized definitions of end points.

Fox et al also highlight the care that was taken in several of their RCTs to ascertain and document adverse events. We standardized the collection of information on adverse events reported in the RCTs included in our systematic review by using widely cited criteria described by Ioannidis and Lau² in a study that assessed the completeness of adverse event reporting. The ideal approach to documenting adverse events in RCT reports continues to be a subject of vital debate.³

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1. World Health Organization. Fact sheets: lymphatic filariasis. <http://www.who.int/mediacentre/factsheets/fs102/en/>. Accessed December 4, 2007.

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Health Consequences of Declining Incomes

To the Editor: The Commentary by Dr Woolf¹ considers possible future health consequences of the current decline in US household income. However, declining incomes among

the middle class and increasing income inequality might not, in and of themselves, have future health consequences.

Income inequalities may instead be symptoms of broader social problems that are in turn responsible for poor health outcomes. For example, the association between income inequality and health in cross-national studies disappears when controlling for educational attainment.² This suggests that problems with schools, not income inequality, may drive the association.

In addition, the burden of disease in the bottom 80% of income earners in the United States—amounting to 17.4 million quality-adjusted life-years lost annually relative to the top 20%—has little to do with purchasing power.³ This lower 80% of US residents ranks second worldwide in terms of purchasing power but has a life expectancy below that of the average Chilean.^{3,4}

Although it is possible to attribute these statistics to racial disparities or lifestyles, by some measures poor white Britons (despite less healthy lifestyles) appear to be healthier than wealthy white US residents.⁵ Woolf is therefore correct in noting that the problems facing the United States affect more than the 12.3% of its residents living below the poverty line. However, the problems are deeper than just loss of income.

To address both the financial well-being and health of the population, policies must move beyond an emphasis on income inequalities alone. Instead, they must focus on underlying causes. Although redistributive programs such as earned income tax credits are needed to help families stay financially afloat in the short-term, proven education interventions such as Head Start may go further toward improving health. Improved public transit and tightened emission standards are also intuitive choices for policies that both improve public health and reduce inequalities. Woolf rightly calls for a new “New Deal” to reduce inequality. But this one must be bolstered by well-funded and tested social welfare programs designed to improve health.

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1. Woolf SH. Future health consequences of the current decline in US household income. *JAMA.* 2007;298(16):1931-1933.

2. Lynch J, Smith GD, Harper S, et al. Is income inequality a determinant of population health? part 1, a systematic review. *Milbank Q.* 2004;82(1):5-99.

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5. Banks J, Marmot M, Oldfield Z, Smith JP. Disease and disadvantage in the United States and in England. *JAMA.* 2006;295(17):2037-2045.

In Reply: I agree with Dr Muennig that education is a major determinant of health. It has been estimated that eliminating differences in mortality associated with education would avert 8 deaths for every life saved by medical ad-

vances.¹ I also agree that the influence of education on health and socioeconomic status probably exceeds that of income. But income is hardly irrelevant; it has independent effects on health status and is interconnected with education as both a mediator and by-product. For example, economic hardship makes learning difficult for students; pre-occupies parents and families with concerns other than their children's study habits; makes tuition unaffordable; and chokes off tax revenue and other resources for schools, teachers, and infrastructure. Income is also a by-product of education: it boosts earnings and provides the means to purchase the commodities of good health (eg, insurance coverage, health care, nutritious foods).

Muennig is certainly correct that boosting household incomes, by itself, will not eradicate health disparities. Neither will diplomas. Health disparities reflect multiple causes, and no singular strategy could be expected to fully solve the problem. Disparities also reflect other individual-level characteristics, some of which are modifiable (eg, smoking, obesity, seeking care for warning symptoms) and some of which are not (eg, race). Apart from individual factors, health is influenced by environmental conditions that individuals cannot directly control, such as pollution, safety, advertising, and the built environment. Finally, health is affected by access to health care and its quality. All of these variables are heavily interrelated, and their associations with health status are vulnerable to confounding.

A comprehensive approach to ameliorating health disparities therefore requires attention to each of these domains and, as Muennig advocates, the pursuit of evidence-based strategies that improve outcomes.² Work is under way in many of these areas, such as improving schools, helping the uninsured, and making cities safer. Amid these high-profile initiatives, however, it is easy to disregard income, in part because the policy solutions are so politically intimidating but perhaps also because the scale of the problem—the stagnated income of much of the population and the rise in poverty rates—is not widely appreciated.

I agree with Muennig that other factors matter more, but I doubt that income plays no role. Failing to address that piece of the puzzle can undermine the other population-based and clinical efforts to reduce disease. Providing schooling and low-cost health care and social services holds less promise if the clientele cannot afford the basic expenses on

which the effectiveness of these programs depends (eg, bus fare and pharmacy bills). Moreover, the ripple effects of financial hardship extend beyond the health sector: it disrupts lives and families, destabilizes communities, lowers workforce productivity, and stifles economic growth.³ Education and other strategies that help the larger population make ends meet are important for public health and the economy.

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CORRECTIONS

Name Correction: In the Commentary entitled "Dementia Screening in Primary Care: Is It Time?" published in the November 28, 2007, issue of *JAMA* (2007;298[20]:2409-2411), information in the introductory paragraph was incorrect. Instead of "the Alzheimer's Disease Foundation has declared November 16 'National Alzheimer's Screening Day,'" the text should read "the Alzheimer's Foundation of America sponsors a National Memory Screening Day in November."

Incorrect NIH Grant Amounts: In the Medical News & Perspectives story entitled "In Era of Tight Funds, NIH Seeks to Nurture New Scientists and Novel Ideas" published in the August 8, 2007, issue of *JAMA* (2007;298[6]:615-616), grant amounts were incorrectly reported. On page 616, in the last line of the table, "NIH Director's Pioneer Award," the amount in column 4 should be \$2.5 million. Also on that page, the first sentence in the first full paragraph in column 1 should be "EUREKA replaces NIGMS' R21 high risk/high impact Exploratory/Developmental Research Grant Awards, said Ravi Basavappa, PhD, a program director for the NIGMS' Division of Cell Biology and Biophysics who also helped design the EUREKA program." In the next paragraph, the third sentence should be "An anticipated 14 awards are expected this year, each providing \$1.5 million over a 5-year project." This article was corrected for error in data on September 6, 2007, prior to publication of the correction in print.

Incorrect Wording in the Comment Section: In the Original Contribution entitled "Effect of Testosterone Supplementation on Functional Mobility, Cognition, and Other Parameters in Older Men: A Randomized Controlled Trial" published in the January 2, 2008, issue of *JAMA* (2008;299[1]:39-52), an increase in insulin sensitivity was incorrectly worded. On page 49, third column, first sentence in the first full paragraph should be "The decrease in fat mass was also accompanied by a decrease in plasma glucose concentration and an increase in insulin sensitivity."