Finding Affordable Health Workforce Targets In Low-Income Nations

ABSTRACT To raise the awareness of a global crisis in human resources for health care, the World Health Organization has suggested a minimum target for all countries: 2.3 health professionals per 1,000 people. Many countries cannot afford to meet the target; in fact, funding the proposed number of health workers would require some countries to devote 50 percent of their gross domestic product to health. We offer an alternative solution that would allow governments to set targets that are realistic and achievable within their financial constraints.

Setting targets—also called norms, benchmarks, objectives, or goals—has played an important role in global public health for many years. It is a useful way of putting new issues on the agendas of national governments and international organizations. Targets allow public health advocates to make the case for additional resources and specific policies within organizations, governments, and multinational agencies.

Smallpox eradication was an important target that mobilized resources and policies around the world, resulting in a unique success in international public health. Recently, the World Health Organization (WHO) target of “three by five”—three million patients undergoing anti-retroviral therapy in five years—set a high standard for a major change in international efforts to address HIV/AIDS. The goal may have played a role in increasing support for treating HIV/AIDS, even though the ambitious target was not reached within the five-year period.

Setting Targets For Health
The Millennium Development Goals, agreed to by the United Nations and other international organizations, set targets in such areas as reducing infant mortality and expanding education, to be reached by 2015. They appear to have been effective in focusing governmental and donor efforts on a limited set of objectives in most lower- and middle-income countries—even though many countries are not expected to reach their targets on schedule.

In an effort to increase the awareness of a global crisis in human resources for health, the WHO recommended a new target for all countries: a minimum of 2.3 health workers per 1,000 people. The target includes professional physicians, nurses, and midwives; it does not include people such as community health workers and lay midwives, because reliable data on the number of these workers are unavailable.

WORLDWIDE SHORTAGE OF HEALTH WORKERS Based on this target, the WHO estimates that there is a worldwide shortage of six million health workers, with sub-Saharan Africa and South Asia experiencing the greatest shortfalls. The Hokkaido Toyako G8 Summit of 2008 recommended that countries address this gap as part of the current agenda for aid from developed countries to low- and middle-income countries.

Although we understand the appeal of a simple target to mobilize support for new international and national initiatives to increase the number of health workers, this target is unrealistic as a short- or medium-term goal for many of the low- and middle-income countries. The other targets mentioned above did mobilize activity, but—with the unique exception of smallpox eradica-
tion—no target has been met.

**NEED FOR REALISTIC GOALS** For operational purposes of planning and budgeting, and to win the necessary financial support of national governments and international donors, it is important to have goals that are realistic and achievable. When unrealistic targets are used as part of a strategic planning exercise, the credibility of the plan and its advocates will be undermined, thus reducing the likelihood that the ultimate goal will be reached. Why should policy makers in key government or donor agencies help a country try to do something that it clearly cannot afford?

In many low- and middle-income countries, most health workers are employed as civil servants. Because of macroeconomic policies, often imposed by agreements with international agencies, many countries have set budget ceilings on public expenditures and wage ceilings in the public sector. Under these conditions, ministries of health face major challenges in negotiations during governmental budgetary processes, especially as ministries of finance and planning usually require compelling evidence to overcome their fiscal charge to restrict budget increases. Case studies have shown that ministries of health with clear, short-term strategies for reaching realistic objectives are the most successful in national budget negotiations.

**COUNTRY-SPECIFIC TARGETS** We believe that country-specific targets for numbers of health workers, based on a realistic recognition of the potential financing available, are more likely than the WHO’s global minimum target to strengthen the negotiating positions of ministries of health in low-income countries. Based on our own experience in strategic planning for human resources in several countries, we believe that country-specific targets will have a better chance of winning the support of national governments and donor stakeholders if they can clearly be afforded on a sustained basis.

National targets would not directly address other human resource problems, such as the inequitable distribution of health workers between urban and rural areas. However, this targeting mechanism can be adjusted by a country’s ministry of health to identify areas below the national target as priorities for programs to improve the distribution of health workers.

In this article we discuss the needs-based approaches that have resulted in targets like that of the WHO. We then present an alternative that is based primarily on estimates of the economic capacities of countries to support human resources for health. We offer different scenarios of how this alternative might work in countries for which we have sufficient data. We conclude with recommendations for how to use these alternative targets for advocacy and planning in specific country contexts.

**Needs-Based Approaches**

Following a long tradition of setting minimum human resource targets based on estimates of the health needs of a population, the WHO’s target of 2.3 health workers per 1,000 people is an interesting new approach to targeting. This figure is derived from recently revised international data on human resources in three categories—physicians, nurses, and midwives—and figures for the percentage of births attended by a trained health worker. It is a simple needs-based estimate, using the percentage of births attended by trained health workers as a proxy for health needs and for the numbers—or densities—of workers associated with a target of having 80 percent of births attended by a trained worker.

**POTENTIAL FOR CRITICISM** Although innovative, this approach is open to criticism. For instance, why should we use the average number of health workers in all countries that reach the 80 percent coverage objective, instead of using the lower average number from more efficient countries that achieve the coverage objective with fewer health workers? In addition, there are more sophisticated methods of determining needs, although it would probably be too costly to use these methods country by country.

**STUDY FROM TANZANIA** A “gold-standard” needs-based approach is illustrated in a recent article on Tanzania, which estimated the number of health workers needed to achieve Tanzania’s Millennium Development Goals. This study used expert opinion to determine the skill mix and numbers of health workers needed. It then matched that information against three scenarios in which varying resources were available. Conducted by the London School of Hygiene and Tropical Medicine, the study involved substantial cost and time. Few countries can afford this kind of sophisticated, complex combination of expert opinion and data analysis to determine realistic targets for planning and advocacy.

One interesting conclusion of the Tanzania study is that even the most optimistic estimates of resources would not produce enough health workers to reach the country’s Millennium Development Goals. A recent study by Richard Scheffler and colleagues, which conducted a demand- and needs-based analysis of health workers, contends that most of the poor countries in Africa will be unable to provide sufficient physicians to meet the WHO’s target by 2015.
percentage of gross domestic product (GDP) required to provide 2.3 health workers per 1,000 people in 166 countries is presented in Exhibit 1. Many countries in Africa and a few in Central America and the Caribbean would have to spend more than 8 percent of their GDP on health to support the minimum number of health workers in the WHO target. That is the average percentage for high-income countries but is higher than that for most low-income countries.

The assumptions for this analysis are as follows: (1) 80 percent of the expenditure on health is recurrent, a figure based on cross-country averages; (2) 70 percent of the recurrent expenditure is spent on staff; (3) the ratio of staffing cost for physicians to that for nurses or midwives is 2:1, based on the cross-national average ratio of salary difference between two professional groups; and (4) only physicians, midwives, and nurses are contributing to the cost of human resources, and the costs are assumed to be the same within each professional category: all nurses, regardless of specialty or length of career, cost the same; similarly, all midwives cost the same, and all doctors cost the same. Our methodology is described in Annex A of the Online Appendix.

We conclude that Ethiopia would have to devote 53 percent of its GDP to health in order to reach the WHO target, if the current ratio between physicians and nurses or midwives remains constant. According to our analysis, forty-six countries would not reach the target, even if they devoted 8 percent of their GDP to health. Even if international organizations and other donors were to pay for a large proportion of the increased cost of health care on a sustained basis, it is unlikely that their contributions would be much more than 2 percent of a country’s GDP. That is the maximum we found for external funding according to the WHO—which still leaves the country having to devote approximately 6 percent of its GDP to health.

Furthermore, recent experience with donor funding from the U.K. Department of International Development and the Global Fund for HIV/AIDS, Malaria, and Tuberculosis to top up professional salaries in Malawi suggests that such funding has the potential to distort local wages, providing opportunities for other sectors

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**EXHIBIT 1**

**Total Health Spending As Percentage Of GDP Required To Meet The WHO Target Of 2.3 Health Professionals Per 1,000 People**

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**Notes**: Gross domestic product (GDP) per capita is displayed in logarithmic scale to show the relative difference of income between countries. Red squares indicate countries requiring a total health expenditure of more than 8 percent of GDP, which cannot achieve the WHO target of 2.3 health professionals per 1,000 people in each country (indicated by the red line). The countries selected were those with data on all three variables in our analysis: current density of health workers, GDP per capita, and total health expenditure figures from the WHO and the World Bank. A version of this exhibit with selected countries labeled is available in the Online Appendix, which can be accessed by clicking on the Online Appendix link in the box to the right of the article online.
to demand salary increases as well—especially if the initial increase is not well justified and widely accepted by society.\textsuperscript{19} In addition, relying on donors to cover salaries over the long term is generally not considered prudent.

An Alternative Supply-Side Approach

A sophisticated labor-market analysis that covers many factors—including the attractiveness of the health professions, salary levels, and other incentives—requires data about or estimates of a large number of variables. Little reliable information about these factors is available for most of the low- and middle-income countries.\textsuperscript{20}

We propose a simple targeting mechanism that does not require such extensive information and that is based on a country’s available financial resources and scenarios of different skill mixes. Reasonable targets could be based on devoting an achievable percentage of GDP to the health sector; maintaining an affordable level of public-sector expenditure on health; using an appropriate share of health funds to pay the salaries of health workers; and shifting the skill mix to a more efficient and less costly combination of physicians, nurses, and midwives.

**Assessing Economic Constraints**

To begin with, we assessed the current economic constraints of 166 countries using World Health Organization and World Bank data, as shown in Exhibit 1 (all data are averages of the period 1999–2003).\textsuperscript{5,21} The assessment is based on current total health expenditure as a percentage of GDP, and total government health expenditure as a percentage of total government budget and as a percentage of GDP. The data show that few low- and lower-middle-income countries—based on the World Bank classification—devote more than 8 percent of their GDP to health. For targeting purposes, we might start with 8 percent as a ceiling, although under specific circumstances we might go as high as 10 percent.

**Estimating a Reasonable Target**

If we assume that 8 percent of GDP is a reasonable ceiling for health expenditure and that the cost of hiring additional health workers remains constant, we can estimate a reasonable human resource target for certain low- and middle-income countries (see Exhibit 2, and Annex B in the Online Appendix).\textsuperscript{18}

For instance, assuming a ceiling of 8 percent of

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**Exhibit 2**

Targets For Human Resources In Health Based On 8 Percent Of Gross Domestic Product Devoted To Health And The Current Physician/Nurse And Midwife Ratio Per 1,000 People

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**Sources**

World Bank. World development indicators 2007. Washington, (DC): World Bank, 2007; and World Health Organization. World health report 2006: working together for health. Geneva: WHO; 2006. **Notes** Gross domestic product (GDP) per capita is displayed in logarithmic scale to show the relative difference of income between countries. Only countries with a realistic target of 3.0 health workers per 1,000 people or fewer are shown. Countries with targets of less than 2.3 health workers per 1,000 people (represented by the red line) cannot achieve the WHO target even with reasonable investment in their health sectors. A version of this exhibit with countries labeled is available in the Online Appendix, which can be accessed by clicking on the Online Appendix link in the box to the right of the article online.
GDP, affordable targets per 1,000 people are 0.35 health workers for Ethiopia, 0.71 for Tanzania, and 2.34 for Kenya (see column 4 of Annex B in the Online Appendix). 

In most lower-income countries, any increase in spending on human resources mainly comes from increasing public budgetary allocations. Therefore, we next assess the public-sector spending on health as a portion of total government spending. National health accounts data from the WHO suggest that it would be optimistic to propose devoting to health more than 10 percent of total government spending, even including funds from external sources. If we use a ceiling of 10 percent of government spending with the current mix of physicians, nurses, and midwives, we get the health worker targets per 1,000 people shown in Exhibit 3 and Annex B in the Online Appendix.

This would mean, for instance, that if we focus on policies directed at the public sector, Ethiopia could reasonably afford slightly more than 0.26 health workers per 1,000 population, while Tanzania could reasonably afford 0.35 (see column 5 of Annex B in the Online Appendix). These targets imply that Ethiopia and Tanzania might not be able to achieve their Millennium Development Goals in their current economic situations, a finding that is consistent with the gold-standard needs-based study of Tanzania.

Although this is unfortunate, it is nevertheless a reminder that goals must be in line with available resources. It makes little sense to set targets that cannot be met, which might lead to cynicism about the use of any target, or to frustration among health policy makers.

Provider Mix

Changing the ratios of doctors to nurses and of doctors to midwives affects the numbers of health workers and their cost. We looked at different ratios that kept costs below the ceiling of 10 percent of total government spending. For example, we looked at what would happen if there were three times as many nurses and midwives combined as physicians. Results of our analysis are presented in columns 6 and 7 of Annex B in the Online Appendix.

Need For Additional Information

As with all such exercises, many assumptions are arbitrary and could be changed in establishing country-by-country targets, as has been done for the Millennium Development Goals. To improve strategic planning and its use in advocating for

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**EXHIBIT 3**

Targets For Human Resources In Health Based On 10 Percent Of Gross Government Expenditure Devoted To Health And The Current Physician/Nurse And Midwife Ratio Per 1,000 People

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**Sources**: World Bank. World development indicators 2007. Washington (DC): World Bank, 2007, and World Health Organization. World health report 2006: working together for health. Geneva: WHO, 2006. **Notes**: Gross domestic product (GDP) per capita is displayed in logarithmic scale to show the relative difference of income between countries. Only countries with a realistic target of 3.0 health workers per 1,000 people or fewer are shown. Countries with targets of less than 2.3 health workers per 1,000 people (represented by the red line) cannot achieve the WHO target even with reasonable investment in their health sectors. A version of this exhibit with countries labeled is available in the Online Appendix, which can be accessed by clicking on the Online Appendix link in the box to the right of the article online.
more resources, we encourage the collection of data that would permit better labor-market analyses. For instance, different incentive structures, such as payments tied to performance improvements, and stronger organization and management structures, including improved logistic systems, can greatly influence how health workers provide their services to different populations. Planners should seriously consider including analyses of such factors.

Conclusion

For low-income and at least some middle-income countries, the WHO’s target of 2.3 health workers per 1,000 people is not reasonable, given financial constraints. However, targets are useful starting points for the development of strategic plans for human resources and useful tools in negotiating for additional resources, especially with national ministries of finance and international donors.

We therefore propose an alternative approach, using targets that can reasonably be achieved within likely budget constraints imposed by a country’s GDP and budget. We also suggest that targets can be changed if skill mixes are changed: Reassigning tasks to less expensive workers can permit a higher target for workers overall.

Our proposal of looking first at a target’s realistic burden on a country’s finances has wider implications. Other international targets, such as the Millennium Development Goals, also need to be recalculated to take a realistic account of resource constraints.

As much as we might agree that there is a compelling need for more resources to achieve major improvements in health in poor countries, there are limits to what can be accomplished within these countries’ economies and current circumstances. To achieve what is possible, we need realistic goals rather than an unachievable set of aspirations.

The authors appreciate the assistance and comments of Marko Vujicic and Ajay Majal, as well as the thoughtful suggestions of the editors of Health Affairs and two anonymous reviewers.

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18 The Online Appendix can be accessed by clicking the Online Appendix link in the box to the right of the article online.
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Thomas J. Bossert is director of the international systems program at the Harvard School of Public Health, which supports work on the organization and financing of health systems and health reform globally. Bossert has conducted research on health system restructuring and reform for more than twenty years in Latin America, Africa, and Asia, supported by, among others, the U.S. Agency for International Development, the World Bank, and the U.K. Department for International Development. He also teaches in the World Bank flagship course on health system strengthening to leaders and researchers around the world.

Bossert received his Ph.D. in political science from the University of Wisconsin–Madison. Since his arrival at Harvard, his work on global health workforce has involved, among other projects, leading a team of Harvard School of Public Health doctoral students in formulating a World Health Organization assessment tool for human resources strategic planning. This tool has been used in several countries to develop their strategic plans for human resource targets and is the core reading for executive training courses given at Harvard.

Bossert has also conducted collaborative research on human resources in health in several countries, and he participated in the creation of human resource strategic plans in Turkey and Ethiopia. In discussing the importance of formulating new, more practical strategies for setting health care workforce targets in developing countries, the focus of his current Health Affairs paper, Bossert noted: “Unrealistic targets get in the way of developing effective and implementable plans. The health leaders who can present realistic arguments for increasing budgets for human resources are more likely to be persuasive with their counterparts in ministries of finance, presidents, and donors.”

Tomoko Ono

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Tomoko Ono is a doctoral student at the Harvard School of Public Health, and her doctoral dissertation considers the magnitude and impact on developing countries of global nurse migration to the United States.

She received her master of public health degree in epidemiology from the Ohio State University School of Public Health, and she has served as a consultant to the World Bank on the issue of Caribbean nurse migration to select Organization for Economic Cooperation and Development (OECD) countries. She has also conducted research for the World Health Organization on chronic disease risk factors.

This work highlighted such as issues as setting realistic versus unrealistic targets, and the importance of program management—themes that feature prominently in this Health Affairs paper.

While at Harvard, Ono has become involved in a World Bank Caribbean nurses study. This project conducts detailed analyses of the labor and education markets in certain Caribbean countries, and it presents recommendations on what interventions for building health care workforce are possible at different levels of investment. Ono said that she and her fellow researchers are hopeful that the project “will be a useful step in building a program for the management of health care workforce in the region.”