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*Lawrence O. Gostin**

Consider two children—one born in sub-Saharan Africa and the other in the United States. The African child is twenty-five times more likely to die in the first five years of life;[1] if she lives to child-bearing age, she is a two hundred times more likely to die in labor;[2] and overall, she will die thirty years earlier than the American child.[3] The global health gap between rich and poor is vast: "in one year alone, fourteen million of the poorest people in the world died [prematurely], while only four million would have died if this population had the same death rate as the global rich."[4]

The international community is well aware of such glaring health inequalities, but it is deeply resistant to taking bold remedial action. International development organizations appear much more concerned with the geostrategic and philanthropic interests of donors than the health needs of the poor. The scale of foreign aid is both insufficient and unsustainable and fails to address the key determinants of health. As a result, the world's distribution of the "good" of human health remains fundamentally unfair, causing enormous physical and mental suffering by those who experience the compounding disadvantages of poverty and ill health.

If the health gap is unfair and unacceptable, then how can the international community be galvanized to make a genuine difference? In this Arti-

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[1] UNITED NATIONS CHILDREN'S FUND [UNICEF], THE STATE OF THE WORLD'S CHILDREN 2007, at 105 (2006), *available at* http://www.unicef.org/sowc07/docs/sowc07.pdf.

[2] UNICEF, PROGRESS FOR CHILDREN: A REPORT CARD ON MATERNAL MORTALITY 44 (2008), *available at* http://www.childinfo.org/files/progress_for_children_maternalmortality.pdf.

[3] UNICEF, *supra* note 1; *see generally* COMM'N ON SOC. DETERMINANTS OF HEALTH, WORLD HEALTH ORG. [WHO], CLOSING THE GAP IN A GENERATION: HEALTH EQUITY THROUGH ACTION ON THE SOCIAL DETERMINANTS OF HEALTH (2008), *available at* http://whqlibdoc.who.int/publications/2008/9789241563703_eng.pdf; J. P. Ruger & H-J Kim, *Global Health Inequalities: An International Comparison*, 60 J. EPIDEMIOLOGY & COMMUNITY HEALTH 928 (2006).

[4] Lawrence O. Gostin, *Meeting Basic Survival Needs of the World's Least Healthy People*, 96 GEO. L.J. 331, 337 (2008) (citing DAVIDSON R. GWATKIN & MICHEL GUILLOT, WORLD BANK, THE BURDEN OF DISEASE AMONG THE GLOBAL POOR 19–20 (2000)).

cle, I propose an international call to action through the adoption of a Global Plan for Justice—a voluntary compact among states and their partners in business, philanthropy, and civil society to redress health inequalities.

The Global Plan for Justice would be a form of "soft" norm setting, rather than a legally binding treaty. It could be achieved relatively easily with the passage of a World Health Assembly resolution. In the resolution, member states would authorize the World Health Organization (WHO) Director General—in collaboration with state and nonstate actors—to establish a Global Plan for Justice. The Director General would negotiate funding commitments, spending priorities, an allocation system, and mechanisms for monitoring, compliance, and implementation. The Global Plan for Justice would not require states to acquiesce to a treaty or to establish a new organization or governance structure. Rather, it would encourage the WHO to exercise its constitutional powers to set norms, exercise leadership, and coordinate activities on the principal dimensions of world health.

Under the Global Plan for Justice, states would devote resources to a Global Health Fund based on their ability to pay—for example, 0.25% of Gross National Income (GNI) per annum—in addition to maintaining current development assistance devoted to programs and activities of their choice. Global Health Fund resources would be allocated based on the health needs of developing countries measured by poverty, morbidity, and premature mortality.

The core missions of the Global Plan for Justice would be to (1) ensure the fair allocation of essential vaccines and medicines, with particular attention to low- and middle-income countries in a public health emergency; (2) meet basic survival needs and create the conditions in which people can be healthy; and (3) help countries that will suffer most to adapt to the health impacts of climate change.

The Global Plan for Justice differs in scale from my more ambitious proposal for a Framework Convention on Global Health.[5] The Framework Convention offers a broadly imagined global health governance system for coordinating actors, setting funding levels and priorities and harnessing the creativity of nonstate actors. However, the negotiation of a multilateral treaty involving resource distribution from rich to poor states would face political obstacles that limit its prospects of success. Because the Global Plan for Justice described in this Article is a voluntary compact and does not create binding legal obligations, it is more likely to gain international acceptance.

Skeptics may counter that a voluntary compact will be less effective in holding powerful states accountable. However, world health—unlike world trade—has never developed mechanisms for adjudication and enforcement, and it is unlikely to do so in the near term. The trade off between a binding and a voluntary compact may be worthwhile because soft norms can still, over time, alter state action. To ensure progress, it will be necessary first to

[5] *See generally id.*

persuade states to assume obligations voluntarily with soft targets and enforcement. Binding international obligations of justice in health must be built over time.

Part I of this Article sets out the Plan's governance structure and describes the problems with current global coordination. Part II sets out the Plan's funding and critiques past donor-driven funding models. And Part III sets out the Plan's priorities, describing the problems with current prioritization of high profile health hazards. In each Part, I explain why extant global health governance is destined to fail and will never meaningfully close the health gap. Changing the paradigm to harmonize fragmented activities, ensure stable funding, and set priorities could dramatically transform prospects for good health among the world's poorest populations.

I. Governance: Coordinating Fragmented Global Health Activities

Despite the importance of a coherent strategy for global health, the traditional system of global health governance has been unable to effectively manage the vast proliferation of new actors. The deluge of actors and initiatives, often focused on specific diseases, includes more than forty bilateral donors, twenty-six UN agencies, twenty global and regional funds, and ninety global health initiatives,[6] not to mention the explosion of aid organizations, religious missions, and volunteers operating on the ground.[7] This increasingly crowded landscape of health programs and funding sources has resulted in rampant fragmentation, duplication, and confusion. Fragmentation can have crippling effects at the national level, where developing countries "face a bewildering array of global agencies from which to elicit support."[8] Consequently health ministries are overburdened with "writing proposals and reports for donors whose interests, activities, and processes sometimes overlap, but often differ."[9]

Other problems arise out of the growing competition between international nongovernmental organizations (NGOs) and local service providers (for example, governments, businesses, and community-based organizations) for funding and human resources.[10] The encroachment of international actors on capable local actors hinders efforts toward greater country accountability and control. When well-funded NGOs create state-of-the-art AIDS clinics, for example, they are able to offer far more lucrative salaries and

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[6] *See* Karen McColl, *Europe Told to Deliver More Aid for Health*, 371 Lancet 2072, 2072 (2008).

[7] *See* Michael Marmot, *Working Through the Issues of Global Governance for Health*, 374 Lancet 1231, 1231 (2009) (more than 37,000 international nongovernmental organizations work in health and development).

[8] David E. Bloom, *Governing Global Health*, 44 Fin. & Dev. 31, 33 (2007), *available at* http://www.imf.org/external/pubs/ft/fandd/2007/12/pdf/bloom.pdf.

[9] *Id.*

[10] *See* Laurie Garrett, *The Challenge of Global Health*, 86 Foreign Aff. 14, 30 (2007).

better working conditions than local providers. This can drain public or private initiatives in the host country, making it even more difficult to provide sustainable services.

Several recent efforts at coordination and harmonization have been launched, such as the Health 8 (H8) and the International Health Partnership (IHP), but they have had limited impact.[11] Led by a handful of powerful elites, the H8 and IHP discuss common agendas but do not harmonize them. They exclude the perspectives of many smaller nongovernmental actors and developing countries.

The Plan's Architecture

The Global Plan for Justice would be administered by the World Health Organization (WHO). Under the Plan, the WHO would have the duty to coordinate currently fragmented global health activities. It would provide a structured forum for all stakeholders, establish effective norms, recommend pathways for cooperative action, and monitor and evaluate compliance. By administering the Global Plan for Justice, the WHO would solidify its intended status as the global health leader.

Critics may question why the Global Plan for Justice places governance responsibilities with the WHO. It is true that the WHO Constitution establishes a broad mission to attain "the highest possible level of health," designates the agency as the "directing and coordinating authority on international health work," and charges the Director General with establishing and maintaining "effective collaboration" with a broad range of actors including intergovernmental organizations, states, and the scientific community.[12] But prominent scholars have strongly criticized the WHO for its reluctance to lead despite its bold constitutional mission and powers.[13] At the turn of the twenty-first century, more than sixty years after its founding, the WHO has lost the confidence of the international community, which in recent years has often turned away from the WHO and toward newly created health institutions, such as the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

Although the WHO faces sharp criticism for its failure to exercise its normative powers, it is the only organization with the mandate and inclusive constituency to lead a major global health initiative. If a new institution were created out of whole cloth for such a global health project, it would

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[11] *See* Christopher J. L. Murray et al., *The Global Campaign for the Health MDGs: Challenges, Opportunities, and the Imperative of Shared Learning*, 370 LANCET 1018, 1019 (2007).

[12] Constitution of the World Health Organization, art. 1, 2, §§ a, b, July 22, 1946, 62 Stat. 2679, 14 U.N.T.S. 185, *available at* http://www.who.int/governance/eb/who_constitution_en.pdf.

[13] *See generally* David P. Fidler, *The Future of the World Health Organization: What Role for International Law?*, 31 VAND. J. TRANSNAT'L L. 1079 (1998); Allyn Lise Taylor, *Making the World Health Organization Work: A Legal Framework for Universal Access to the Conditions for Health*, 18 AM. J.L. & MED. 301 (1992).

severely undermine the WHO. Thus, rather than creating another global health governance structure with high opportunity costs, the Global Plan for Justice aims to bolster the power and legitimacy of the WHO. Among all other alternatives, the agency is in the best position to harmonize the activities of state and nonstate actors.

II. Funding: Sustainable and Scalable Resources for Global Health

Perhaps the most important goal for global health governance is to ensure that international funding is adequate, predictable, and scalable to needs. Obstacles at both the international and national levels currently thwart this goal. At the international level, the WHO is highly dependent on member states for financial resources to carry out its constitutionally mandated functions. As a result, the agency is chronically under-resourced, with funding increasingly devoted to special projects that are favored by donors but do not reflect actual global burdens of injury and disease.[14]

At the national level, developing countries desperately need funding to build capacity, yet funding is sporadic and subject to the political discretion of donors. From year to year, donors may increase or decrease funding, initiate new programs or discontinue existing programs, or place restrictive conditions on the use of resources. In this unpredictable environment, ministries of health cannot build infrastructure, operate programs, or sensibly plan for the long term. What developing countries need are stable and predictable sources of funding, with discretion to spend on local priorities.[15]

A problem with current funding approaches is that there is no method of holding rich states accountable for providing sufficient and stable international health assistance to states that lack the capacity to provide for themselves. Certainly, states and philanthropists have significantly increased global health funding, which rose to $21.8 billion in 2007.[16] This level of financial assistance may appear substantial, but it remains modest in comparison to the annual $1.5 trillion spent globally on military expenditures (2.4% of global GDP),[17] and the $265 billion spent on agricultural subsides.[18]

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[14] *See* David Stuckler et al., *WHO's Budgetary Allocations and Burden of Disease: A Comparative Analysis*, 372 Lancet 1563, 1563 (2008).

[15] *See* Devi Sridhar, *Seven Challenges in International Development Assistance for Health*, J.L. Med. & Ethics (forthcoming 2010) (summary available at http://www.globaleconomicgovernance.org/wp-content/uploads/Sridhar-Seven-Challenges-in-International-Development-Assistance-for-Health.pdf).

[16] Nirmala Ravishankar et al., *Financing of Global Health: Tracking Development Assistance for Health From 1990 to 2007*, 373 Lancet 2113, 2113 (2009).

[17] World Bank, Military Expenditure (% of GDP), http://datafinder.worldbank.org/military-expenditure?cid=GPD_42 (on file with the Harvard Law School Library).

[18] Org. for Econ. Co-operation & Dev. [OECD], Agricultural Policies in OECD Countries 4 (2009), *available at* http://www.oecd.org/dataoecd/37/16/43239979.pdf.

In 1970, powerful states pledged to give 0.7% of their Gross National Income (GNI) per annum to Official Development Assistance.[19] The deadline for reaching that target was the mid-1970s, and by 2015 (the target date for the achievement of the Millennium Development Goals (MDGs)) the pledge will be forty-five years old.[20] Rich states have renewed the pledge over the years; for example, in 2005, the Group of Eight (G8) countries promised a $25 billion annual increase in development assistance for Africa by 2010, driven by the European Union's pledge to raise members' aid spending for poverty reduction to the target of 0.7% by 2015.[21] The routine reiteration of the 0.7% commitment suggests it is rising to the level of an agreed international norm.

Even factoring in new investments (for example, disaster relief and the U.S. President's Emergency Plan for AIDS Relief), the Organisation for Economic Co-operation and Development (OECD) countries have not come close to fulfilling their pledges. Their real contribution has only recently risen to a high of 0.33%.[22] The developed world has similarly fallen short in supporting the MDGs and the Global Fund to Fight AIDS, Tuberculosis, and Malaria.[23] To close the vast investment gap, OECD countries would have to increase Global Fund pledges from $6 billion to $38 billion by 2015.[24] And they would need to spend an additional $52.4 billion to reduce child mortality as promised in the MDGs.[25] With these additional expenditures, the WHO projects that millions of lives would be saved every year.[26]

In general, the global health governance system must reach agreement on both the funding levels needed to achieve key priorities and the responsibility of rich states to provide this funding. Figuring out innovative ways to

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[19] International Development Strategy for the Second United Nations Development Decade, G.A. Res. 2626 (XXV), ¶ 43, U.N. Doc. A/8214 and Add. 1 (Oct. 24, 1970) ("Each economically advanced country will progressively increase its official development assistance to the developing countries and will exert its best efforts to reach a minimum net amount of 0.7 per cent of its gross national product at market prices by the middle of the Decade.").

[20] *See* Anup Shah, *US and Foreign Aid Assistance*, Global Issues, Apr. 13, 2009, http://www.globalissues.org/article/35/us-and-foreign-aid-assistance (on file with the Harvard Law School Library).

[21] *See* Ronald Labonte & Ted Schrecker, *Foreign Policy Matters: A Normative View of the G8 and Population Health*, 85 Bull. WHO 185, 186 (2007), *available at* http://www.who.int/entity/bulletin/volumes/85/3/06-037242.pdf.

[22] *See* ONE Campaign, The Data Report 2009, at 88 (2009), *available at* http://www.one.org/international/datareport2009/pdfs/DR2009.pdf.

[23] *See* UN Millennium Project, Investing in Development 55–65 (2005), *available at* http://www.unmillenniumproject.org/documents/overviewEngLowRes.pdf.

[24] Comm'n on Macroecon. & Health, WHO, Macroeconomics and Health: Investing in Health for Economic Development 21 (2001) (arguing international assistance should increase from current annual level of $6 billion to $27 billion by 2007 and $38 billion by 2015).

[25] Karin Stenberg et al., *A Financial Road Map to Scaling Up Essential Child Health Interventions in 75 Countries*, 85 Bull. WHO 305, 305 (2007), *available at* http://www.who.int/bulletin/volumes/85/4/06-032052.pdf (stating that an additional $52.4 billion is required for 2006–2015 to reach MDGs in child mortality).

[26] *See* Labonte & Schrecker, *supra* note 21, at 186.

ensure adequate and enduring levels of support for agreed-upon priorities will be vital in ensuring that poor countries gain the capacity to deal with both everyday health threats and public health emergencies.

In addition to inadequate funding levels, another key global health governance problem is the absence of an agreed-upon mechanism to collect, distribute, and prioritize foreign health assistance. Each country has unfettered discretion to contribute the amount it wants, to whomever it wants, and for whatever purpose it wants. As a result, the level of assistance is unpredictable and not scaled to real needs—that is, funding does not match the burden of diseases in recipient countries or reflect country priorities, and the activities supported do not address the fundamental determinants of ill health. This leads to chronic problems in international health that perpetuate, or even exacerbate, health inequalities. Without assured funding streams, low- and middle-income countries cannot develop and sustain effective health services for their populations.

The Plan's Financing Mechanisms

To achieve the objective of sustainable funding, the Global Plan for Justice would set achievable targets for states to contribute annually to the new Global Health Fund according to their ability to pay. Although the exact levels would be subject to negotiation under WHO auspices, a realistic figure could be 0.25% of GNI per annum. This contribution would be in the form of unrestricted official development assistance, and its calculation would not include private donations or capital flows and investments.[27]

In addition to setting targets for state contributions to the Global Health Fund, the Global Plan for Justice would call on states to continue their current development assistance devoted to health programs of their choice. The resulting total percentage of GNI dedicated to international development assistance for health, taking into account both contributions to the Global Health Fund and discretionary funds, would be equivalent at minimum to the 1970 pledge of 0.7% of GNI per annum. This level of funding would guarantee considerable resources for the three principal focal areas of the Global Plan for Justice—essential medicines, basic needs, and climate change adaptations—while still committing states to meet the overall target established more than thirty-five years ago. The combined funding level would be a testament to the priority that governments put on poverty reduction and improved health.

The Global Health Fund would also provide more predictable funding scaled to real needs. There is already a disease-specific fund dedicated to collecting and dispersing international health assistance—the Global Fund to

[27] *See* G.A. Res. 2626 (XXV), *supra* note 19, ¶¶ 45–47 ("Financial aid will, in principle, be untied.").

Fight AIDS, Tuberculosis, and Malaria.[28] But that fund is far too narrow in scope to meet the basic survival needs that are the focus of the Global Plan for Justice. Consequently, the Global Plan for Justice would create a dedicated Global Health Fund and would have the authority to collect resources from nations according to their ability to pay and the authority distribute these funds according to need. Gorik Ooms and his colleagues have proposed a similar fund, which they argue must be tied to a suitable governance structure like the one proposed here.[29] The Global Fund to Fight AIDS, Tuberculosis and Malaria demonstrates that such a fund can be developed through voluntary collective action. But it must have a broader mandate and agreed-upon funding levels if it is to address the key determinants of health.

III. Priority Setting: From High-Profile Causes to Programs That Work[30]

Currently, international development assistance for health is ineffective. It is often driven by emotional, high visibility events, such as large-scale natural disasters; diseases that capture the public's imagination, such as HIV/AIDS; or diseases with the potential for rapid global transmission, such as SARS. These funding streams skew priorities and divert resources away from efforts to build stable local health systems to meet everyday needs.

Furthermore, a relatively small number of wealthy donors currently wield considerable influence in setting the global health agenda. These include OECD countries, the Gates Foundation, and the Global Fund to Fight AIDS, Tuberculosis and Malaria. Although well-meaning, this small group of wealthy donors often sets priorities that do not reflect local needs and preferences. Donors often fund politically popular projects rather than those most likely to improve global health. For example, the United States devotes nearly seventy percent of its global health budget to AIDS, with much of the rest going to countries of geostrategic importance like Afghanistan, Iraq, Israel, and Pakistan.[31] Donors also tend to concentrate on specific diseases or narrow self-interests instead of larger, systemic problems that cause failing health systems and exacerbate all diseases. This focus on disease-specific programs (also called "vertical" programs) can divert resources

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[28] Global Fund to Fight AIDS, Tuberculosis, and Malaria, About Us, http://www.theglobalfund.org/en/about/ (on file with the Harvard Law School Library).

[29] *See generally* Gorik Ooms & Rachel Hammonds, *Correcting Globalization in Health: Transnational Entitlements Versus the Ethical Imperative of Reducing Aid-Dependency*, 1 Pub. Health Ethics 154 (2008).

[30] *Editor's Note*: The following section represents a synthesis of several of Professor Gostin's earlier writings on the global health gap, presented here in relation to his proposal for the Global Plan for Justice. *See generally* Gostin, *supra* note 4; Lawrence O. Gostin, Foreword, *Socioeconomic Disparities in Health: A Symposium on the Relationships Between Poverty and Health*, 15 Geo. J. on Poverty L. & Pol'y 571 (2008); Lindsay Wiley & Lawrence O. Gostin, *The International Response to Climate Change*, 302 JAMA 1218 (2009).

[31] George J. Schieber et al., *Financing Global Health: Mission Unaccomplished*, 26 Health Aff. 921, 927 (2007).

from systemic ("horizontal") approaches that build health system capacity and meet basic survival needs.[32]

The Global Plan for Justice would follow those scholars and advocates who have urged for a "human security" approach to health, "a truly universal package of guaranteed benefits or entitlements, comprising [a] set of essential services applied to all in the world."[33] In particular, the Plan would prioritize three core obligations needed to achieve human security, especially for those suffering from compounding disadvantages: access to essential vaccines and medicines; satisfaction of basic survival needs (including food, water, sanitation, and vector controls); and the ability to respond to the effects of climate change.

A. Essential Vaccines and Medicines

All people need access to essential vaccines and medicines to achieve and maintain high levels of health. To be maximally effective and fair, access must address both ongoing needs and urgent needs during public health emergencies, such as the H1N1 pandemic.

Chronic Needs

According to the WHO, essential vaccines and medicines "are those that satisfy the priority health care needs of the population."[34] They are selected for their impact on the public's health "with due regard to disease prevalence," based on evidence of comparative cost effectiveness.[35] Using these criteria, the WHO has developed a Model List of essential medicines, which countries use as a guide to develop their own specific lists that meet their national requirements.[36] However, despite the relatively widespread adoption of essential medicine lists, the dream of universal access to essential vaccines and medicines has not been attained, undermining the health-related Millennium Development Goals (MDGs) for children, women, and persons living with AIDS.

Preventative vaccination is one proven cost-effective means by which to reduce the burden of disease. Bill Gates has described the halving of childhood deaths over five decades due to vaccinations as "one of the most

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[32] *See generally* Phusit Prakongsai et al., *Can Earmarking Mobilize and Sustain Resources to the Health Sector?*, 86 BULL. WHO 898 (2008), *available at* http://www.who.int/entity/bulletin/volumes/86/11/07-049593.pdf.

[33] Julio Frenk, *Strengthening Health Systems to Promote Security*, 373 LANCET 2181, 2181 (2009).

[34] WHO, Essential Medicines, http://www.who.int/medicines/services/essmedicines_def/en/index.html (on file with the Harvard Law School Library).

[35] *Id.*

[36] *Id.*

amazing statistics ever."[37] As researcher Kate Taylor and her colleagues state: "It is better to prevent disease than to allow avoidable human suffering, incur the costs of care and treatment, and suffer the economic consequences of lost work and lower productivity."[38]

Many vaccines are most effective when administered during childhood, that is, before potential exposure to disease. Although childhood immunization is at an all-time high,[39] two and a half million individuals of all ages die each year from vaccine-preventable diseases including diphtheria, tetanus, pertussis (whooping cough), and measles.[40] An additional $1 billion per year invested towards immunization would minimize these preventable deaths by vaccinating more than seventy million children in the seventy-two poorest countries.[41] In an effort to achieve two-thirds reduction of childhood mortality by 2015, in line with the MDGs, UNICEF's Global Immunization Vision and Strategy calls for a rise in global vaccination coverage for common preventable childhood diseases, with a goal of at least ninety percent coverage in every country over the next five years.[42] The Strategy establishes four target areas: immunizing more people, introducing new vaccines and technologies, integrating immunization to other health interventions and surveillance within the health system, and managing immunization in the context of global interdependence.[43]

Children are not the only population to suffer from preventable deaths. Poor women are also disproportionately affected by the lack of access to essential vaccines. While approximately seventy percent of cervical cancers are preventable through human papillomavirus vaccines and cervical cancer screenings, every year cervical cancer affects nearly five hundred thousand women and causes over a quarter of a million deaths, eighty percent of which occur in developing countries.[44] Developing counties are disproportionately burdened by this disease in part because of the lack of access to screenings and vaccinations in these countries.[45]

In addition to vaccinations, other essential medicines can work successfully as inexpensive biological interventions for many conditions. However,

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[37] BILL GATES, BILL & MELINDA GATES FOUND., 2009 ANNUAL LETTER FROM BILL GATES 4 (2009), *available at* http://www.gatesfoundation.org/annual-letter/Documents/2009-bill-gates-annual-letter.pdf.

[38] Kate Taylor et al., *The Need for New Vaccines*, 27 VACCINE (SUPP. 6) G3, G3 (2009), *available at* http://www.ghstrat.com/vaccine121609.pdf.

[39] WHO & UNICEF, GLOBAL IMMUNIZATION DATA 1 (2009), *available at* http://www.who.int/immunization/newsroom/GID_english.pdf.

[40] *Id.*

[41] Lara J. Wolfson et al., *Estimating the Costs of Achieving the WHO-UNICEF Global Immunization Vision and Strategy, 2006–2015*, 86 BULL. WHO 27, 35 (2008), *available at* http://www.who.int/bulletin/volumes/86/1/07-045096.pdf.

[42] UNICEF, The Global Immunization Vision and Strategy (GIVS), http://www.unicef.org/immunization/index_27089.html (on file with the Harvard Law School Library).

[43] *Id.*

[44] WHO & INSTITUT CATALÀ D'ONCOLOGIA, HUMAN PAPILLOMAVIRUS AND RELATED CANCERS 6 tbl.3, 12 tbl.7 (2010), *available at* http://apps.who.int/hpvcentre/statistics/dynamic/ico/country_pdf/CUB.pdf.

[45] *See id.* at 44 fig.34, 45 fig.35.

certain highly publicized diseases have received a disproportionate amount of public and private attention, pushing other more widespread or inexpensively treatable conditions out of the realm of public discussion. For example, the movement to increase access to antiretroviral (ARV) medications for AIDS has properly rallied intergovernmental organizations, governments, and activists, thus reducing AIDS-related deaths by over ten percent in the past five years.[46] These efforts have made ARVs more accessible to AIDS patients in developing countries by reducing the cost of treatments from thousands to hundreds of dollars annually.[47] Unfortunately, ARVs must be taken daily and for a lifetime, rendering them a still costly intervention. And with the rise in drug-resistant forms of HIV infection and the vastly increased costs of them, the cost of widespread antiretroviral treatment is likely to rise even higher.

In contrast, intestinal worms and other bacterial infections can be treated in a short duration for a relatively low sum. For example, onchocerciasis, also known as river blindness, is a major cause of blindness and skin disease in many African countries. This condition is highly treatable, however, as demonstrated by the WHO's African Programme for Onchocerciasis Control.[48] By promoting and facilitating the successful distribution of ivermectin (also known under the brand name Mectizan), the program effectively decreased the number of onchocerciasis cases from 41.8 million in 1995 to 25.7 million in 2008.[49] Mectizan is a single dose, annual treatment that costs only a couple of dollars.[50]

Similarly, trachoma, an infectious eye disease that can result in blindness after prolonged exposure to infection, can be treated with antibiotics and a simple surgical procedure costing less than ten dollars.[51] In order to help minimize global blindness—three percent of which is caused by trachoma—the WHO is currently working to develop the Alliance for Global Elimination of Trachoma by 2020.[52] The Alliance will implement methods based on the WHO's "SAFE" strategy—surgery, antibiotics, facial cleanliness, and environmental improvement.

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[46] *See* WHO & JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS [UNAIDS], AIDS EPIDEMIC UPDATE 8 (2009), *available at* http://data.unaids.org/pub/Report/2009/JC1700_Epi_Update_2009_en.pdf.

[47] *See* WHO, UNAIDS & UNICEF, TOWARDS UNIVERSAL ACCESS: SCALING UP PRIORITY HIV/AIDS INTERVENTIONS IN THE HEALTH SECTOR 74 (2009), *available at* http://www.who.int/hiv/pub/tuapr_2009_en.pdf.

[48] *See* WHO, African Programme for Onchocerciasis Control, http://www.who.int/apoc/en/ (on file with the Harvard Law School Library).

[49] *See* WHO, African Programme for Onchocerciasis Control: About Us, http://www.who.int/apoc/about/en/index.html (on file with the Harvard Law School Library).

[50] *See id.*

[51] Rob M. P. M. Baltussen et al., *Cost-Effectiveness of Trachoma Control in Seven World Regions*, 12 OPHTHALMIC EPIDEMIOLOGY 91, 100 (2005).

[52] WHO, Trachoma, http://www.who.int/blindness/causes/trachoma/en/index.html (on file with the Harvard Law School Library).

These illustrations represent the classic case for increasing access to essential medicines in poor countries by demonstrating that low-cost treatments can be highly effective in reducing the burden of disease.

Health Impact

There are several factors that contribute to the lack of availability of essential vaccines and medicines in poor populations. At present, less than ten percent of the world's biomedical research funds are dedicated to addressing the problems responsible for ninety percent of the world's disease burden. This so-called 90/10 divide exists because developing countries bear the greatest disease burden but do not offer sufficiently lucrative markets to encourage pharmaceutical and biotechnology companies to invest in curing the diseases of poverty. "The development of drugs is so skewed towards the needs of rich countries that only 1% of new treatments—just 16 drugs—developed over the past 25 years were for diseases . . . found mainly in the developing world."[53]

The current intellectual property right regime exacerbates this disincentive. The issuance of patents often allows companies to charge monopoly prices that developing countries cannot afford, and rich states have actively pursued increasingly restrictive intellectual property rules through multilateral treaties such as the Trade-Related Aspects of Intellectual Property Rights agreement (TRIPS) and bilateral agreements such as TRIPS Plus.[54] As a result, private drug companies have little incentive to invest in research that will reduce the disease burden in poor countries.

Barriers exist even to the treatments of diseases that have been deemed worthwhile research investments, such as AIDS, because monopoly prices (albeit often discounted or donated) impede developing countries' access to these treatments. In the case of AIDS, the drastic decrease in costs of ARVs over a short period of time, as mentioned above, was facilitated by the lack of patent protection in certain countries such as Brazil and India that had the capacity to manufacture the drugs.[55] These countries were thus able to mass manufacture generic versions of ARVs, producing a competitive market that resulted in reduced prices.[56]

Overall, the combination of private industry incentives, intellectual property hurdles, and the 90/10 divide works to obstruct poor populations'

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[53] Nathan Ford, Medecins Sans Frontiers, The 90/10 Divide (Aug. 1, 2002), http://www.msf.org/msfinternational/invoke.cfm?component=article&method=full_html&objectid=7A67B622-4CCB-4612-AC59B95227BF0E45 (on file with the Harvard Law School Library).

[54] *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 108 Stat. 4809, 869 U.N.T.S. 299, *available at* http://www.wto.org/english/docs_e/legal_e/27-trips.pdf.

[55] *See* Campaign for Access to Essential Meds., The Impact of Patents on Access to Medicines, http://www.msfaccess.org/main/access-patents/introduction-to-access-and-patents/the-impact-of-patents-on-access-to-medicines/ (on file with the Harvard Law School Library).

[56] *See id.*

access to essential medicines despite the existence of inexpensive methods to effectively minimize the burden of disease.

Public Health Emergencies

Public health emergencies such as the H1N1 (swine flu) pandemic, the Samoan tsunami, and the Sumatran and Haitian earthquakes underscore the immediate and crucial need for fair allocation of vaccines and medicines. Mass disasters almost inevitably lead to a surge in demand that causes a scarcity of medicines. In the face of such scarcities, poor countries tend to be left behind. If the threat is a novel one, such as an emerging infectious disease, treatments must be discovered, tested, produced, and delivered in a much narrower time frame than usual. In order to assure this rapid roll-out, governments will often have to fund the necessary research, development, and deployment, which poor countries will not be able to afford. The pharmaceutical industry is also likely to supply markets that can afford to pay and countries where they are located. In addition, more than ninety percent of the world's capacity to manufacture some vaccines is concentrated in Australia, Europe, and North America.[57] During mass disasters, governments face intense pressure to protect their own citizens, making rich countries likely to hoard the vaccines and medicines they produce and purchase rather than sharing their supplies with poor countries. All of these factors leave poor countries in Africa, Asia, and Latin America much more vulnerable to public health emergencies.

The global response to the H1N1 pandemic is a case in point. The U.S. Congress has authorized $7.65 billion in H1N1-related spending, with the vast majority for therapeutic interventions such as vaccine development and distribution and stockpiling of the antiviral Tamiflu.[58] Health and Human Services Secretary Kathleen Sebelius requested full funding for a drive to vaccinate all Americans if necessary.[59] This is on top of the greater than $7 billion dollar federal authorization for Influenza A (H5N1 or avian influenza).[60] Public and private spending on influenza treatments has resulted in a windfall for the pharmaceutical industry, with Roche reporting that sales of Tamiflu tripled and GlaxoSmithKline predicting huge profits from a vaccine.[61]

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[57] Lawrence O. Gostin, *Pandemic Influenza: Public Health Preparedness for the Next Global Health Emergency*, 32 J.L. MED. & ETHICS 565, 569 (2004).

[58] Mitchel L. Zoler, *U.S. Government Pays the H1N1 Vaccination Bill*, THELANCET.COM, Oct. 12, 2009, http://www.thelancet.com/H1N1-flu/egmn/0c03bfca (on file with the Harvard Law School Library).

[59] *See* News Release, U.S. Dep't of Health & Human Servs., Obama Administration Calls on Nation to Begin Planning and Preparing for Fall Flu Season & the New H1N1 Virus (July 9, 2009), *available at* http://www.hhs.gov/news/press/2009pres/07/20090709a.html.

[60] *See generally* Lawrence O. Gostin & Benjamin E. Berkman, *Pandemic Influenza: Ethics, Law, and the Public's Health*, 59 ADMIN. L. REV. 121 (2007).

[61] Andrew Pollack, *Sales of Flu Drug Improve Results at Roche*, N.Y. TIMES, July 24, 2009, at B3.

Despite the vast sums spent on these novel strains of influenza, very little will go to benefit low- and middle-income countries. In October 2009, when the first doses of H1N1 vaccine became available in the United States,[62] the WHO estimated worldwide production capacity to be "about 3 billion doses per year in 12 months if all available capacity is devoted to pandemic vaccine."[63] Although the WHO called for efforts to ensure equitable access to the H1N1 vaccine for low- and middle-income countries, funding was secured for only around two hundred million doses.[64] Originally, the United States pledged, along with ten other countries, to donate ten percent of its vaccine doses to developing countries, even though it had yet to meet its own vaccine demands.[65] However, with more severe vaccine shortages than anticipated, the Department of Health and Human Services chose to reevaluate its initial commitment. "It has always been the [P]resident's intention," Secretary Sebelius stated, "that the safety and security of the American people be a priority in the production and distribution."[66] Accordingly, only a minuscule $350 million of H1N1 resources in the United States are being spent for global health and child survival, and two-thirds of that sum will go to surveillance, which benefits rich countries more than the poor.[67]

To put all this in perspective, although the United States may ultimately donate leftover doses to developing countries,[68] its response to the first phase of the H1N1 pandemic shortage presents a clear example of a wealthy country prioritizing its own citizens at the expense of poorer countries during a public health emergency. As of early 2010, well after populations were immunized in the developed world, the WHO still had very little vaccine to distribute to the poor.

The WHO has stated that the pandemic is declining, but with confirmed deaths estimated at over twelve thousand worldwide, the current inequitable

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[62] *See* Ctrs. for Disease Control & Prevention, Questions & Answers: Vaccine Against 2009 H1N1 Influenza Virus, http://www.cdc.gov/h1n1flu/vaccination/public/vaccination_qa_pub.htm (on file with the Harvard Law School Library).

[63] WHO, Production and Availability of Pandemic (H1N1) 2009 Vaccines, http://www.who.int/csr/disease/swineflu/frequently_asked_questions/vaccine_preparedness/production_availability/en/index.html (on file with the Harvard Law School Library).

[64] *See id.* ("WHO's goal is to provide each of these 95 countries with enough vaccine to immunize at least 10% of its population.").

[65] *See* Chris Neefus, *Sebelius Says U.S. Will Donate Part of H1N1 Vaccine Supply to Foreign Nations Before Meeting This Nation's Demand*, CNSNEWS.COM, Oct. 22, 2009, http://www.cnsnews.com/news/article/55907 (on file with the Harvard Law School Library).

[66] Penny Starr, *Sebelius: Feds Knew H1N1 Vaccine Supply Was Not Enough to Cover At-Risk Americans*, CNSNEWS.COM, Oct. 29, 2009, http://www.cnsnews.com/news/article/56269 (on file with the Harvard Law School Library).

[67] *See* Supplemental Appropriations Act 2009, Pub. L. No. 111-32, § 701, 123 Stat 1859, 1884–85.

[68] *See More H1N1 Vaccine Has U.S. Urging Shots for All*, ASSOCIATED PRESS, Dec. 17, 2009, http://www.msnbc.msn.com/id/34465289 (on file with the Harvard Law School Library).

distribution of H1N1 vaccines remains an important concern.[69] If the pandemic is sustained, those who suffer from compounding disadvantages, such as the dual burden of infectious and chronic disease, will suffer most. At the same time, if the virus mutates or genetically combines with the avian influenza virus, it could become far more pathogenic.

Serious questions of global social justice arise when wealth, rather than need, becomes the primary criterion for allocating life-saving therapeutics. The maldistribution of vaccines in the face of a global health crisis will only widen the already large health gap between the rich and the poor. The WHO defines equity as "[t]he fair distribution of benefits and burdens," noting that "in some circumstances, it may be equitable to give preference to those who are worst off, such as the poorest, the sickest, or the most vulnerable."[70] In the case of mass disasters, justice requires that scarce interventions go to the most disadvantaged in the world, because they are at the greatest risk of serious illness and death from a novel infection. Allocation of resources to the world's most vulnerable is likely to have the maximum beneficial effect on morbidity and premature mortality.[71] Equitable access to essential medical resources is not merely a moral imperative—it is also critically necessary for the success of any pandemic strategy to safeguard global health given the rapid international spread of infectious diseases.

B. Basic Survival Needs

While access to essential medicines and vaccines can greatly improve the life prospects of the poor, such interventions are ultimately limited in their ability to reduce morbidity and premature mortality. For example, medicines and vaccines are only effective against certain diseases. What is truly needed, and what richer countries instinctively (although not always adequately) do for their own citizens, is to meet what I call "basic survival needs—namely those needs essential to restoring human capability and functioning."[72] By focusing on the major determinants of health, the international community could improve global health.

Basic survival needs include sanitation and sewage; pest control; clean air and water; diet and nutrition; reductions in tobacco use; and well-functioning health systems for the prevention, detection, and mitigation of disease and premature death. Basic survival needs are laid out in international agreements. Three of the eight MDGs, for example, are health-related: child mortality, maternal health, and the reduction of the burden of infectious dis-

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[69] *See* Stephanie Nebehay, *May Take a Year to Conquer H1N1 Flu Pandemic*, REUTERS, Dec. 29, 2009, http://www.reuters.com/article/idUSTRE5BS14B20091229 (on file with the Harvard Law School Library).

[70] WHO, ETHICAL CONSIDERATIONS IN DEVELOPING A PUBLIC HEALTH RESPONSE TO PANDEMIC INFLUENZA, at v (2007), *available at* http://www.who.int/csr/resources/publications/WHO_CDS_EPR_GIP_2007_2c.pdf.

[71] Gostin, *supra* note 57, at 569.

[72] Gostin, *supra* note 4, at 337.

eases.[73] The UN Economic and Social Council finds that basic survival needs are a core commitment of the right to health, and that they include access to food, potable water, sanitation, disease prevention and treatment, primary health care, and health education.[74]

The following sections illustrate the power of meeting basic human needs.

Sanitation and Engineering

Basic sanitation and engineering can have a dramatic impact on the health of the world's poor. Many of the diseases of poverty are water-borne (for example, cholera, diarrhea, guinea worm, and schistosomiasis), mosquito-borne (for example, dengue fever, elephantiasis, malaria, and yellow fever), or rodent-borne (for example, plague, lassa fever, hantavirus, and leptospirosis). Wild rodents also serve as reservoirs for flea- or tick-borne diseases such as typhus, Lyme disease, and relapsing fever.[75] These diseases are preventable through personal hygiene, environmental sanitation, and structural changes to abate the source of the infection.

Water and sanitation play a pivotal role in sustainable development and health. More than a billion people lack access to drinkable water and more than 2.4 billion lack access to basic sanitation.[76] Ensuring clean water sources, such as potable drinking water and parasite-free lakes and rivers, can prevent most cases of water-borne diseases. Simple improved sanitation measures include the construction of latrines, basic engineering advances to provide clean drinking water, and disinfestation of standing bodies of water. Something as simple as piped water could substantially reduce child mortality, and the simple use of preventive equipment such as household point-of-use water treatment kits can similarly reduce diarrhea episodes plaguing children in poor countries.[77] Such interventions are highly cost effective and can significantly reduce the disease burden at nominal expense. Point-of-use kits costing only a little over three dollars can treat a thousand liters of water.[78] Other simple approaches that can prevent water-borne diseases in-

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[73] *See generally* UNITED NATIONS, MILLENNIUM DEVELOPMENT GOALS REPORT 2009 (2009), *available at* http://www.un.org/millenniumgoals/pdf/MDG_Report_2009_ENG.pdf.

[74] *See* U.N. Comm. on Econ., Soc. & Cultural Rights, *General Comment 14: The Right to the Highest Attainable Standard of Health*, U.N. Doc. E/C.12/2000/4 (2000), *available at* http://www.unhcr.org/refworld/docid/4538838d0.html.

[75] *See, e.g.*, HANS ZINSSER, RATS, LICE AND HISTORY: A BACTERIOLOGIST'S CLASSIC HISTORY OF MANKIND'S EPIC STRUGGLE TO CONQUER THE SCOURGE OF TYPHUS (1934).

[76] *See* U.N. DEV. PROGRAMME, THE HUMAN DEVELOPMENT REPORT 2006, at 2 (2006), *available at* hdr.undp.org/en/media/HDR06-complete.pdf.

[77] *See* Alix Peterson Zwane & Michael Kremer, *What Works in Fighting Diarrheal Diseases in Developing Countries? A Critical Review* 4 (Ctr. for Int'l Dev. at Harvard Univ., Working Paper No. 140, 2007), *available at* http://www.cid.harvard.edu/cidwp/pdf/140.pdf.

[78] *See* Pavani Kalluri Ram et al., *Bringing Safe Water to Remote Populations: An Evaluation of a Portable Point-of-Use Intervention in Rural Madagascar*, 97 AM. J. PUB. HEALTH 398, 398 (2007).

clude drilling wells, treating local water sources with a mild pesticide, or filtering drinking water with a cloth to remove guinea worms.[79]

Mosquito-borne diseases are more resistant to amelioration, but cost-effective interventions exist to prevent them by reducing the mosquito population and human exposure. An insecticide-treated bednet, which costs roughly five dollars and provides protection for up to five years, is highly effective in reducing malaria, river blindness, elephantiasis, and other insect-borne diseases among children.[80] But only about one in seven children in Africa sleep under a net, and only three percent of children use an insecticide-treated net.[81] Structurally, using insecticides and reducing larval breeding sources can also be effective. Dicophane (DDT) has "a remarkable safety record when used in small quantities for indoor spraying in endemic regions."[82] Yet many donor agencies refuse to fund its use.[83] First world environmental concerns are preventing a highly effective intervention for the world's poor.

Rodent-borne diseases are also resistant to amelioration, but the burden of disease can be significantly reduced by sanitation and disinfestations. Improving human hygiene and environmental sanitation can deprive rodents of food, living spaces, and passage into inhabited areas. The use of poisons, bait, and traps can also reduce rodent populations.

Basic engineering and sanitation can result in remarkable benefits for the health of the world's poorest people. Advanced biomedical research, huge financial investments, and complex programs are not the only options. As I have previously written: "Just as industrialized countries profoundly reduced the prevalence of disease during the late nineteenth century through sanitary measures applied to water, food, pests, and the environment, so too can this be accomplished at relatively low cost in the world's poorest regions."[84]

Health Systems: Infrastructure and Capacity Building

There is little doubt that the single most effective way to ensure population health would be to build enduring health systems in all countries. States

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[79] *See* Donald G. McNeil, Jr., *Dose of Tenacity Wears Down an Ancient Horror*, N.Y. TIMES, Mar. 26, 2006, § 1, at 1.

[80] *See* David H. Molyneux & Vinand M. Nantulya, *Linking Disease Control Programmes in Rural Africa: A Pro-Poor Strategy to Reach Abuja Targets and Millennium Development Goals*, 328 BRIT. MED. J. 1129 (2004).

[81] *See* WHO & UNICEF, AFRICA MALARIA REPORT 2003, at 26 (2003), *available at* http://www.rollbackmalaria.org/amd2003/amr2003/pdf/amr2003.pdf; John M. Miller et al., *Estimating the Number of Insecticide-Treated Nets Required by African Households to Reach Continent-wide Malaria Coverage Targets*, 297 JAMA 2241, 2243–44 (2007).

[82] Gavin Yamey, *Roll Back Malaria: A Failing Global Health Campaign*, 328 BRIT. MED. J. 1086, 1087 (2004).

[83] Roger Bate & Kathryn Boateng, Honesty Is a Virtue, *in* Foreign Affairs, How to Promote Global Health: A Foreign Affairs Roundtable, Jan. 24, 2007, http://www.foreignaffairs.org/special/global_health/ (on file with the Harvard Law School Library).

[84] Gostin, *supra* note 4, at 371.

and local communities must possess well-functioning public health systems with sound infrastructures and adequate human resources. If more international assistance went into helping poor states develop and maintain health systems, these states might become capable of safeguarding their own populations, rather than remaining dependent on foreign assistance. Poor countries do not need foreign aid workers to parachute in and rescue their people from specific diseases that seem important to donors. Nor do they need foreign-run, state-of-the-art facilities. Rather, they need to gain the capacity to provide basic health services for themselves. Health system capacity has the added benefit of improving global health by significantly reducing the potential for disease migration to other countries and regions. Local capacities empower health professionals to prevent, rapidly detect, treat, and contain health hazards before they spread out of control.[85]

Governments possess a primary duty to safeguard their populations against significant health hazards.[86] Public health agencies, in collaboration with civil society partners (for example, businesses, the community, and the media), have a responsibility to create the conditions for people to be healthy.[87] Their role is to identify, prevent, and ameliorate risks to health in the population. To do so, poor countries do not need advanced technology or sophisticated equipment. Rather, they require basic capabilities: disease surveillance tools, laboratories, health information data systems, and a competent workforce. There are multiple inexpensive public health functions that are vital for a healthy community, such as health education, hygiene and sanitation, uncontaminated food and drinking water, pest removal, and access to immunizations and essential medicines. By training and supporting epidemiologists, biostatisticians, health educators, and public health nurses, poor countries can find sustainable solutions to their own problems.

An integral part of a country's health system is basic primary health care that is as close as possible to where people live and work. The WHO Alma-Ata Declaration defined primary health care as "essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible [and affordable] to individuals and families in the community . . . at every stage of their development in the spirit of self-reliance and self-determination."[88] In 2008, on the thirtieth anniversary of Alma-Ata, as globalization placed social cohesion under stress and health systems continued to underperform, the World Health Report called for a renewal of public health care.[89] Director General Margaret Chan

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[85] *See generally* WHO, THE WORLD HEALTH REPORT 2000: HEALTH SYSTEMS: IMPROVING PERFORMANCE (2000), *available at* http://www.who.int/whr/2000/en/whr00_en.pdf.

[86] *See* LAWRENCE O. GOSTIN, PUBLIC HEALTH LAW: POWER, DUTY, RESTRAINT 5 (2008).

[87] *See* INST. OF MED. OF THE NAT'L ACADS., THE FUTURE OF THE PUBLIC'S HEALTH IN THE 21ST CENTURY 17 (2002), *available at* http://books.nap.edu/openbook.php?record_id=10548.

[88] Int'l Conference on Primary Health Care, Declaration of Alma-Ata § 6, Alma-Ata, USSR (Sept. 6–12, 1978), *available at* http://www.who.int/hpr/NPH/docs/declaration_almaata.pdf.

[89] WHO, WORLD HEALTH REPORT 2008: PRIMARY HEALTH CARE NOW MORE THAN EVER, at xi (2008), *available at* http://www.who.int/whr/2008/whr08_en.pdf.

asked political leaders to "pay close attention to rising social expectations for health care—care that is fair as well as efficient," and to renew their commitment to emphasizing "local ownership . . . that honour[s] the resilience and ingenuity of the human spirit and makes space for solutions that are created by communities, owned by them, and sustained by them."[90]

The components of primary health care include counseling, maternal and child health, family planning, and medical treatment. Primary health care does not require advanced tertiary care centers or even highly specialized physicians. Rather, it requires family doctors, nurses, midwives, and community health workers to take care of pregnant women, safely deliver babies, teach people how to live safely, and diagnose and treat the most common injuries and diseases. Primary care promotes individual and community self-reliance and participation in the planning, organization, operation and control of health services, making the fullest possible use of both local and national resources.[91]

Everyday survival needs may lack the glamour of high-technology medicine, but what they lack in excitement they gain in their potential impact on health. Well-functioning health systems have the potential to deal with the major causes of common disease and disabilities across the world.

C. Adaptation to Climate Change

A scientific consensus exists that climate change is caused by human activity and has a negative impact on human health, particularly for the poor.[92] Although these inequitable effects are increasingly understood, international climate change negotiations are still focused more on environmental degradation and species reductions than on human health. In the interests of global justice, the international community should not only seek to reduce further climate change, but should implement strategies for adaptation by those who will be most affected.

The numerous direct and indirect linkages between climate change and human health can be divided into four categories: extreme events, water and food supply, climate-sensitive diseases, and air quality. First, evidence shows that climate change causes increasingly intense and frequent natural disasters such as tropical storms, floods, heat waves, droughts, and wildfires, which will result in injury, disease, and mass evacuations to unsanitary shelters.[93] Although the causal relationship between climate change and particu-

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[90] Margaret Chan, *Return to Alma-Ata*, 372 LANCET 865, 865–66 (2008).

[91] *See* PAN AM. HEALTH ORG., WHO, RENEWING PRIMARY HEALTH CARE IN THE AMERICAS 15–16 (2007), *available at* http://www.paho.org/English/AD/THS/primaryHealthCare.pdf.

[92] *See generally* W. Neil Adger et al., *Assessment of Adaptation Practices, Options, Constraints and Capacity*, *in* CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY 717 (M. L. Parry et al. eds., 2007), *available at* http://www.ipcc.ch/publications_and_data/ar4/wg2/en/contents.html (examining the challenges of adaptation to climate change among humans and ecological systems).

[93] Ulisses Confalonieri et al., *Human Health*, *in* CLIMATE CHANGE 2007, *supra* note 92, at 391, 394.

lar disasters is difficult to establish,[94] the heat wave in Europe (2003), the flooding in Mumbai (2005), and Hurricane Katrina in the United States (2005) are illustrative of events that are likely to occur more often in the future. More people will die from natural disasters, especially in areas of the world that lack the physical and institutional infrastructure to prevent and treat mass casualties.[95] Indirectly, these events will also result in the contamination of surface water and drinking water, causing gastrointestinal illness and leading to an increase in trauma and stress-related mental illness.[96]

Second, climate change is particularly devastating for human health because it drastically reduces the supply of clean water needed for drinking, sanitation, and crop irrigation. Climate change is also expected to play a major role in putting much of Africa under severe water stress as soon as 2020.[97] "The impacts . . . on freshwater systems and their management are mainly due to the observed and projected increases in temperature, sea level and precipitation variability."[98] Scarcity in sanitary water sources will dramatically increase diarrheal illnesses. According to the WHO, by "2030 the estimated risk of diarrhea will be up to ten percent higher in some regions than if no climate change occurred."[99] Ecosystem changes and water scarcity will also impair crop, livestock, and fisheries yields, leading to increased hunger and a heightened likelihood of famines.[100] These cataclysmic events may result in economic instability, mass migrations, civil unrest, and armed conflict in a time of competition for increasingly scarce resources.

Third, climate change creates fertile conditions for, and alters the geographic range of, disease vectors such as mosquitoes, ticks, and rodents, bringing them into greater contact with human populations that are insufficiently aware of the diseases they carry.[101] Malaria, for example, is expected to move to higher altitudes,[102] and dengue is expected to move farther north

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[94] *See, e.g.*, World Meteorological Org. Int'l Workshop on Tropical Cyclones, Statement on Tropical Cyclones and Climate Change ¶ 21 (2006), *available at* http://www.wmo.int/pages/prog/arep/tmrp/documents/iwtc_statement.pdf.

[95] WHO et al., *Summary* to Climate Change and Human Health—Risk and Responses 15 (2003), *available at* http://whqlibdoc.who.int/publications/2003/9241590815.pdf ("Developing countries are poorly equipped to deal with weather extremes, even as the population concentration increases in high-risk areas like coastal zones and cities. Hence, the number of people killed, injured or made homeless by natural disasters has been increasing rapidly.").

[96] Ctrs. for Disease Control & Prevention, Climate Change and Public Health, http://www.cdc.gov/ClimateChange/effects/extremeweather.htm (on file with the Harvard Law School Library).

[97] Intergovernmental Panel on Climate Change, Climate Change and Water 79 (Bryson Bates et al. eds., 2008), *available at* http://www.ipcc.ch/pdf/technical-papers/climate-change-water-en.pdf.

[98] Z. W. Kundzewicz et al., *Freshwater Resources and Their Management*, *in* Climate Change 2007, *supra* note 92, at 175.

[99] WHO et al., *supra* note 95, at 19.

[100] Confalonieri et al., *supra* note 93, at 399, 413.

[101] *Id.* at 403.

[102] M. Pascual et al., *Malaria Resurgence in the East African Highlands*, 103 Proc. Nat'l Acad. Sci. U.S. 5829, 5829 (2006), *available at* http://www.pnas.org/content/103/15/5829.full.pdf.

and south, increasing the number of people at risk of contracting these diseases. In the next seventy years, the risk of dengue could become twice as large as the risk absent any climate change.[103] Scientists also anticipate increases in food- and water-borne illness, both of which thrive in warmer conditions.[104]

Fourth, climate change affects air quality, particularly in urban environments, as increased temperatures exacerbate air pollution, especially ground-level ozone and particulate matter.[105] Rising temperatures and higher concentrations of CO_2 will also increase the concentration of allergenic aeropollens.[106] The impact of climate change on air quality will add to the burden of respiratory and cardiovascular diseases, particularly among the chronically ill, such as individuals with asthma.[107]

Although climate change will affect every region of the world, it will disproportionately burden the global poor and exacerbate global health disparities. The World Bank estimates that developing countries would bear 75–80% of the costs of climate change.[108] Even a 2°C warming above preindustrial temperatures—the minimum the world is likely to experience—could result in permanent reductions in GDP of 4–5% for Africa and South Asia.[109] Of the approximately 600,000 deaths that occurred worldwide as a result of weather-related natural disasters during the 1990s, some 95% of these were in poor countries. Other research suggests that "climate change caused a loss of 5.5 million disability-adjusted life years in 2000—84% of them in Sub-Saharan Africa and East and South Asia."[110] In fact, disadvantaged populations already live on the edge, with extreme scarcity of clean water and nutritious food, as well as high rates of endemic and epidemic infectious disease. The world's poorest people also have the least capacity to ameliorate the potentially devastating effects of climate change. They have weak health systems, poor infrastructures, and less technological and manufacturing capabilities, which undermine their ability to adapt to rapidly changing weather conditions. Most are in tropical and subtropical regions already subject to a highly variable climate.

Health concerns should play a crucial role in climate change negotiations, but thus far, environmental governance structures have largely failed to include health advocates and policymakers in a coordinated response to climate change. The U.S. delegation to the 2009 Copenhagen Summit, for example, did not include the Health and Human Services Secretary or mem-

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[103] Confalonieri et al., *supra* note 93, at 408.
[104] *Id.* at 400.
[105] *Id.* at 401.
[106] *Id.* at 402.
[107] Paul John Beggs & Hilary Jane Bambrick, *Is the Global Rise of Asthma an Early Impact of Anthropogenic Climate Change?*, 113 Envtl. Health Persp. 915, 915–19 (2005).
[108] World Bank, World Development Report 2010: Development and Climate Change 5 (2010), *available at* http://siteresources.worldbank.org/INTWDR2010/Resources/5287678-1226014527953/WDR10-Full-Text.pdf.
[109] *Id.*
[110] WHO, World Health Report 2002, at 72 (2002), *available at* http://www.who.int/whr/2002/en/whr02_en.pdf; World Bank, *supra* note 108, at 41.

bers of the House Committee on Health, Education, Labor, and Pensions.[111] In addition, although global health advocates understand the importance of climate change, they have failed to delve into the potential of environmental policy as a tool for promoting global health. This is a critical time for public health advocates to demand that political leaders safeguard the health of the world's population.

The Global Plan's strategy to address the effects of climate change on human health is two-pronged. First, the Plan calls for the incorporation of land-use and agricultural mitigation, such as avoiding deforestation and degradation and pursuing sustainable agricultural practices. These efforts not only reduce the environmental harms that contribute to climate change, they also increase long-term resilience and provide more immediate collateral benefits by protecting populations from extreme weather events, reducing the risk of infectious disease, and improving air, soil, and water quality.[112] Second, the Plan advocates for full funding of adaptation projects as a global priority. Adaptation programs are aimed at altering natural or human systems to prepare populations to survive the effects of climate change. They include disease surveillance and response, food and water security, and natural disaster preparedness. Global health advocates have been urging for programs like these for decades.

Originally, the international community focused its climate change efforts almost exclusively on mitigation. However, adaptation-based programs have become more common. The crucial question looming in the aftermath of the UN Copenhagen negotiations is whether the developed countries' offer to help the world's poor to adapt to climate change is sufficient to meet their needs. The focus of the final draft of the Copenhagen Accord was on mitigation and emissions reductions. However, the nonbinding accord also called for developed nations to provide a total of $30 billion for developing nations over the next two years, which is to be allocated equally between mitigation and adaptation and prioritized for the most vulnerable developing nations.[113] The Accord also called for $100 billion in funding by the year 2020.

Since 2001, the UN Framework Convention on Climate Change has developed three funds to support adaptation-based programs in developing nations: the Least Developed Countries Fund, the Adaptation Fund, and the Special Climate Change Fund. As of 2009, developed countries had pledged

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[111] *See* Press Release, House Speaker Nancy Pelosi, Pelosi Leads Bipartisan Delegation to Copenhagen (Dec. 16, 2009), *available at* http://www.speaker.gov/newsroom/press-releases?id=1478; *see also* Press Release, The White House, President to Attend Climate Talks (Nov. 25, 2009), *available at* http://geneva.usmission.gov/2009/11/25/obama-copenhagen/.

[112] *See* David Takacs, *Carbon into Gold: Forest Carbon Offsets, Climate Change Adaptation, and International Law*, 15 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 39, 43–44 (2009).

[113] U.N. Framework Convention on Climate Change, Copenhagen Accord ¶ 8, Draft Decision -/CP.15 (Dec. 7–18, 2009), *available at* http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf.

only about $300 million to these funds.[114] This amount does not even begin to meet the mounting needs of the poor as they cope with a changing climate that could threaten their survival. In addition to substantially increasing financial support for these and other similar funds, the international community should also promote adaptation by ensuring that existing development programs comply with environmental objectives. Emphasis should be placed on sustainable development. Money utilized to meet the needs of current populations in the developing world should be spent in a way that will allow future generations, in light of changing environments, to meet their health and other needs as well.

Climate change will continue to have a profound impact on human health, especially among the world's most vulnerable populations. Leaders in the developed world should frame climate change as a public health issue. First, as a matter of global justice, the international community should work with public health experts to ensure that money is appropriated not only to mitigate climate change, but also to adapt human systems to ameliorate the health consequences of climate change in the world's poorest countries. This will entail a significant transfer of wealth, but it is needed to ensure that the poor are protected against harsh environmental conditions for which they are not responsible. Second, by focusing on the harmful effects of climate change on disease, air quality, and food and water supply, politicians may have an easier time supporting these programs, especially in countries like the United States where climate change is still controversial.

Adaptation to climate change, and its integral connection with global health, is among the defining issues of our time. If the international community does not act boldly, and with a full sense of global justice, the health gap between rich and poor will only grow larger and more ethically problematic.

Toward a Bold and Innovative Global Compact To Reduce the Unconscionable Health Gap

In this Article, I have sought to demonstrate the unconscionable health burdens borne by the world's poorest people and the failure of political will to close this yawning health gap. If the international community truly desires to close the gap, it must find bold and innovative solutions. Here I have proposed a Global Plan for Justice—an international compact among states, industry, philanthropy, and civil society to take immediate and concrete steps to pursue global justice. This international accord would focus on three of the most fundamental solutions to reduce suffering and early death: essential vaccines and medicines to treat both for chronic needs and mass disasters, basic survival needs to ensure the conditions in which all

[114] Climatefundsupdate.org, Climate Funds, Dec. 2009, http://www.climatefundsupdate.org/listing (on file with the Harvard Law School Library).

people can be healthy, and adaptation to the dramatic adverse effects of climate change.

The Global Plan for Justice should not be difficult to accomplish. It requires no international treaty and no cumbersome governance system. Rather, it relies on the voluntary agreement of the world's rich countries, based on a recognition of their ethical obligations to the poor. Additionally, it places the responsibility to forge an agreement on the World Health Organization, which should assume its place as the global health leader.

The Global Plan would not be a panacea, but would genuinely address the key global health challenges that have thus far thwarted international efforts to close the health gap. These challenges—which have been so resistant to change—include the deep fragmentation of actors and programs, the paucity of resources to meet large needs in a predictable and scalable fashion, and the failure to address the deep underlying determinants of ill health and early death among the world's poor.

The uncomfortable truth is that closing the health gap is well within the means of the international community. The resources needed are quite small when compared with existing expenditures on, for example, arms or agricultural subsidies. We possess the scientific knowledge base about how to drastically reduce health risks through basic sanitation, hygiene, food, water, and other necessities. And international health agencies have long championed the primary importance of building capacity for well-functioning health systems. But political communities in wealthy countries still prefer their pet projects over effective and efficient coordinated action. They follow policies that are consistent with their geostrategic interests and the interests of favored domestic pressure groups, not with the needs of the global poor.

Cooperative action for global health, such as the Global Plan for Justice, benefits those living with systematic disadvantages, but it also does much more than that by diminishing our collective vulnerabilities. The international community must do more than lament ongoing, unconscionable health inequalities. It must act boldly and with a shared voice. If we do not, then the avoidable suffering and early death among the world's least healthy people will continue unabated. That is a breach of social justice that is no longer ethically acceptable.