Should Access to Medicines and TRIPS Flexibilities Be Limited to Specific Diseases?

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I. Disease-Based Limitations in Global Patent Law

The health needs of most of the world’s population are not well served by patent-based pharmaceutical markets. The poor in low- and medium-income countries (LMICs) lack the financial resources to sustain the attention of global commercial drug companies. After an extensive consultation process, in 2006 the World Health Organization’s Commission on Innovation, Intellectual Property and Public Health issued its Report (the WHO CIPIH Report), finding this concern to be significant:

“In the context of our work one of the important points is that, where the market has very limited purchasing power, as is the case for diseases affecting millions of poor people in developing countries, patents are not a relevant factor or effective in stimulating R&D and bringing new products to market.”

On this issue, the WHO CIPIH Report was preceded by the Access to Medicines movement, an informal coalition of civil society organizations such as Médecins Sans Frontières, Treatment Action Campaign, Health GAP, Oxfam, and Knowledge Ecology International (formerly the Consumer Project on Technology). These groups and many others identified patents on pharmaceuticals as an inappropriate barrier to access in developing countries. They devoted particular attention to the World Trade Organization TRIPS Agreement, which is the minimum global legal standard for pharmaceutical patents. In response to challenges about the need for innovation, some have reframed the movement as “Access + Innovation.” This article follows in the Access + Innovation genre, attempting to simultaneously solve for both equitable access and optimal innovation.
Global patent-based pharmaceutical companies and the United States Trade Representative (USTR) have not been particularly supportive of the Access + Innovation agenda. Many attempts have been resisted, even to the point of suing South Africa for its use of unlicensed AIDS drugs in the face of an epidemic. In response to sustained global pressure, the companies eventually conceded the case in South Africa, and the WTO members unanimously adopted the *Doha Declaration* in November 2001. But several attempts have been made to limit access initiatives and TRIPS flexibilities to particular diseases, namely AIDS, tuberculosis and malaria, or more generally to infectious public health emergencies.

The primary concern appears to be profit-driven: companies are concerned that any flexibilities for LMICs could lead to price erosion in high-income markets, through physical or virtual arbitrage, demands for expanded access, compulsory licensing, or other TRIPS flexibilities. These concerns are especially acute for blockbuster drugs treating major chronic diseases.

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Nothing in the TRIPS Agreement limits compulsory licenses or other flexibilities to a narrow category of diseases. In the Doha Declaration itself, the US requested an explicit limitation to particular diseases and was the last country to assent to the unanimous resolution. The ultimate compromise language states:

“We recognize the gravity of the public health problems afflicting many developing and least-developed countries, especially those resulting from HIV/AIDS, tuberculosis, malaria and other epidemics.”

At first blush, this appears to be a disease-specific limitation, but the Doha Declaration merely uses the Big 3 to illustrate examples of “national emergency or other circumstances of extreme urgency.” The Doha Declaration clearly supports WTO Members’ rights to utilize TRIPS flexibilities – including compulsory licensure and parallel trade – to “protect public health” without regard to the type of disease:

“Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO Members’ right to protect public health and, in particular, to promote access to medicines for all.”

This point has been honored primarily in the breach. Under the Doha Declaration “Paragraph 6” process, compulsory licenses could be issued for export to low-income countries, bypassing Article 31(f) of the TRIPS Agreement, which restricts compulsory licenses predominantly for domestic use. When Canada enacted its Access to Medicines Regime to permit Paragraph 6 exports, the law limited compulsory licenses to specific listed medicines. This list has been criticized for its excessive narrowness – only 57 drugs or vaccines. The list is effectively limited to AIDS and off-patent medications. Many of the listed drugs treat AIDS; most of those AIDS drugs are available generically already. Almost all of the other drugs on the list are off patent or face legal generic


9 GAO TRADE POLICY REPORT, at 23.
10 Doha Declaration, at par. 1.
11 Doha Declaration, at par. 5(c).
12 Doha Declaration, at par. 4, 5(b), 5(c), 5(d); GAO TRADE POLICY REPORT, at 11-26.
13 Doha Declaration, at par. 4.
competition in a similar form. The only patented non-AIDS drugs on the list are
eflornithine (for the treatment of African sleeping sickness) and levofloxacine (an
important antibiotic). Others are just curious choices considering the global burden of
disease (testosterone injection). Ivermectin is also listed, despite Merck’s promise to
donate it in the river blindness campaign. The very narrow positive list in the Canadian
Access to Medicines Regime operates as a disease-specific limitation on compulsory
licensure under Paragraph 6.

More recently, major drug companies and USTR have resisted Thailand’s efforts to issue
compulsory licenses on patented drugs for heart disease and cancer. When Thailand
attempted to use the very TRIPS flexibilities guaranteed and encouraged by the DoHa
Declaration, a backlash ensued from conservative media, pharmaceutical manufacturers,
and the US government. The WALL STREET JOURNAL editorial page attacked the Thai
compulsory licenses as “seizures” that cynically distorted WTO rules, while a property-
rights activist group charged the Thai government with violating global trade rules.18
Abbott, the manufacturer of lopinavir/ritonavir, withdrew pending applications for drugs
in Thailand, including a heat-stable version of an important fixed-dose combination drug
for AIDS with particular usefulness in a tropical climate.19 The USTR then placed
Thailand on the special 301 “priority watch list” for alleged violations of intellectual
property law, mentioning in particular the compulsory license.20

The TRIPS Agreement is subject to dispute resolution under the WTO Dispute
Settlement Understanding, but the US Government is unlikely to initiate a WTO panel
against Thailand. The TRIPS Agreement authorizes members like Thailand to issue
compulsory licenses for these drugs.21 For all the bluster in the WALL STREET JOURNAL,
it is clear that the controlling legal texts do not limit the use of TRIPS flexibilities to any
particular set of diseases.

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16 The off-patent drugs include: amphotericin B, azithromycin, beclomethasone/beclometasone,
ceftazidime, ceftriaxone, ciclosporin(e), ciprofloxacin, daunorubicin, doxorubicin, enalapril, erythromycin,
etoposide, ibuprofen, isoniazid + pyrazinamide, insulin, ivermectin, levodopa + carbidopa, lithium
carbonate, metoclopramide, metronidazole, morphine, nifedipine, nitrofurantoin, ofloxacin, potassium
chloride, rifampin, salbutamol/albuterol, timolol. Patent status was taken from the US FDA Orange Book,
17 Apiradee Treerutkuarkul, Talks With Pharma-Giants Collapse, BANGKOK POST (Dec. 18, 2007); Brent
Savoie, Thailand’s Test: Compulsory Licensing In An Era of Epidemiologic Transition, 48 VA. J. INT’L L.
211 (2007); Outterson & Kesselheim, at xxx.
18 Editorial, Bangkok’s Drug War Goes Global, WALL STREET JOURNAL, (March 7, 2007); M. Vaughan, In
Clash with Activists, Critics Charge Thailand Violation of Trade Rules, INTELLECTUAL PROPERTY WATCH,
(March 19, 2007).
19 Médecins Sans Frontières, Press Release: Abbott Should Reconsider its Unacceptable Decision to Not
20 Office of the United States Trade Representative, 2007 SPECIAL 301 REPORT 27 (2007) [hereinafter,
SPECIAL 301 REPORT].
21 Indeed, as the GAO reports, the USTR itself concedes the point. GAO TRADE POLICY REPORT, at 48-49.
The USTR stated that the decision to place Thailand on the Special 301 “priority watch list” was “not
solely on [Thailand’s] compulsory license decision.” Id., at 49.
Nor should they. From the perspective of public health, limiting access programs and TRIPS flexibilities to particular diseases would be quite dangerous and unnecessary. Dangerous because the diseases of the world’s rich and poor countries are converging, including non-communicative diseases such as heart disease, stroke, diabetes, cancer and depression. Radically cheaper medicines for these conditions could significantly improve health in LMICs. Limitation is also unnecessary because proven tools can be deployed to preserve high-income markets while LMICs pursue equitable flexibilities.22

Perhaps another factor is at work here as well. An implicit assumption is that the diseases of developing countries are essentially different from diseases in the United States or Europe. Paradigmatic cases include exotic tropical diseases such as Ebola Hemorrhagic Fever23 and onchocerciasis (river blindness). These neglected diseases and their victims are so remote from the US experience that special charitable programs seem unobjectionable. But only a very small portion of the disease burden in developing countries comes from these exotic tropical neglected diseases. Drugs produced for high-income markets can treat most of the global disease burden, such as the pressing need for cancer therapies in LMICs, where cancer deaths outnumber AIDS deaths.24 The number one cause of death in LMICs isn’t a neglected tropical disease, but a familiar “rich country” killer: heart disease.25

To date, the important global legal texts retain broad application to all relevant diseases, but the some parties continue to propose disease-specific limitations, most recently in the World Health Organization’s Intergovernmental Working Group on Public Health, Innovation and Intellectual Property (the “WHO IGWG”).26 The WHO IGWG’s task is to distill the WHO CIPIH REPORT into a global strategy and plan of action. This article hopes to influence the final text of the IGWG GLOBAL STRATEGY, finding that disease-specific limitations on access programs and TRIPS flexibilities are inappropriate in markets for medicines, but disease-specific programs are important in markets for neglected disease innovation.

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22 For my most recent defense of equitable access in the face of diversion, see Outterson & Kesselheim, at xxx. For an earlier defense set in a broader theoretical context, see Pharmaceutical Arbitrage, at 261-68. In the context of adaptive innovation leading to the creation of a distinctive product, diversion is much less likely.


24 Institute of Medicine, CANCER CONTROL OPPORTUNITIES IN LOW- AND MIDDLE-INCOME COUNTRIES (National Academies Press: 2007).


II. Global Pharmaceutical Markets For Medicines & Innovation

In order to understand the relevance of disease-specific limitations, we must distinguish between markets for medicines and markets for innovation. The patent system joins them together, using patent-protected high prices for medicine to create markets for innovation. James Love and Tim Hubbard have suggested separating these markets through a prize system and generic licensing, but for the purposes of this article we need only to conceptually distinguish between the two. My aim is to evaluate whether significant differences exist between high-income countries and LMICs that are relevant to global pharmaceutical markets.

Markets for Medicines

IP rights stimulate pharmaceutical innovation by creating an artificial market enforced by patents, trademarks, and exclusivity periods. IP rights enable companies to charge higher prices, which make these medicines more expensive in the absence of generic competition. Patent rents can price most of humanity out of the market, reducing access to life-saving medicines. Paul Hunt, the UN Special Rapporteur on the right to the highest attainable standard of health, estimates that more than 2 billion people are effective priced out of the market for patented drugs. This message has been articulated for many years by leading advocates for equitable access to medicines. The WHO CIPIH REPORT found that the effectiveness of IP rights depends greatly on the context, especially the poverty of the patients needing medicines:

“But where most consumers of health products are poor, as are the great majority in developing countries, the monopoly costs associated with

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29 Paul Hunt, HUMAN RIGHTS GUIDELINES FOR PHARMACEUTICAL COMPANIES IN RELATION TO ACCESS TO MEDICINES 1 (Draft for Consultation, 19 September 2007); see also Oxfam, Investing For Life: Meeting Poor People’s Needs for Access to Medicines Through Responsible Business Practices, Oxfam Briefing Paper 109, at 2 (Nov. 2007).

patents can limit the affordability of patented health-care products required by poor people in the absence of other measures to reduce prices or increase funding. Thus the overall effect of intellectual property regimes is context-specific – the impact in a country such as India may differ from that in Thailand or in Ghana.\textsuperscript{31}

In wealthier countries, access issues from IP-induced higher prices are ameliorated by government-subsidized insurance and other social mechanisms. The global market for medicines in high-income countries amounts to over $550 billion in 2006.\textsuperscript{32} High prescription drug prices are often paid by government or social insurance funds. These payors are the primary global markets for patent-based drug companies, even though some exercise monopsony power to negotiate lower drug prices.\textsuperscript{33} Outside of the US, public or social insurance funds account for the great majority of OECD pharmaceutical expenditures.\textsuperscript{34}

Public subsidies for prescription drug markets are also significant and growing in the US. US retail prescription drug expenditures (excluding pharmaceuticals purchased by institutions such as hospitals) topped $200 billion in 2005.\textsuperscript{35} Public funds accounted for just 27\% of this US total in 2005, but that figure will grow substantially with the establishment of Medicare Part D.\textsuperscript{36} This program is projected to cost over $52 billion in

\textsuperscript{31} WHO CIPIH REPORT, at 20.
\textsuperscript{32} IMS Health estimates the global pharmaceutical market at $643 billion in 2004. IMS Health, Global Pharmaceutical Sales, 1999-2006 available at http://www.imshealth.com/ims/portal/front/articleC/0.2777.6599_880528184_80528202.00.html (visited Nov. 30, 2007). Companies do not typically break out their financial results by high-income v. low- and medium-income categories, but the World Health Assembly estimated that approximately 90\% of drug sales are in developed countries. World Health Assembly, INTELLECTUAL PROPERTY RIGHTS, INNOVATION AND PUBLIC HEALTH (WHA 56.27) (May 28, 2003). My estimates also confirm that 90\% or more of the patent-based drug companies’ profits derive from high-income countries. Kevin Outterson, Patent Buy-Outs For Global Disease Innovations For Low- and Middle-Income Countries, 32 Am. J. L. & Med. 159-73 (2006). For Merck, approximately 7.5\% of its global revenues come from developing countries. Outterson & Kesselheim, at xxx. In its 2006 Form 10-K filed with the US Securities and Exchange Commission, Merck derived more than half of its global revenue from the United States in 2006. The “other” category accounted for 10.6\% of global revenues, but this category included Australia and New Zealand while excluding Africa and the Middle East. Merck & Co. Inc., Form 10-K at n. 20, p. 120 (filed with the US Securities and Exchange Commission) (Feb. 28, 2007).
\textsuperscript{34} OECD PRICING REPORT, at viii-ix.
\textsuperscript{35} Aaron Catlin et al., National Health Spending In 2005: The Slowdown Continues, 26 HEALTH AFFAIRS 142, 143 (Exh. 1) (January/February 2007).
2008. Many purchases of inpatient pharmaceuticals are paid through public funds in Medicare Part A or Medicaid, amounting to tens of billions of dollars per year. Even with these subsidies, drug access problems re-emerge in the US when out-of-pocket costs are high.

Even privately insured US purchasers receive significant tax subsidies. More than 47% of US outpatient pharmacy expenditures were covered by private insurance, which itself draws a significant tax subsidy. The income tax exclusion for employer provided health insurance is a tax expenditure estimated at $102.3 billion in fiscal year 2004. Since outpatient pharmaceuticals accounted for approximately 10% of US health spending in 2005, this provision alone is a $10 billion tax expenditure supporting the domestic pharmaceutical market.

**Markets for Pharmaceutical Innovation**

Global expenditures for health research totaled $125.8 billion in 2003, from both public and private funds. Direct expenditures from public funds accounts for about 45% of the total, approximately $56.1 billion in 2003. Public funding includes government grants, such as more than $28 billion from the U.S. National Institutes of Health in

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37 Congressional Budget Office, _The Budget and Economic Outlook: Fiscal Years 2008-2017_ 58-59 (Box 3-2) (Jan. 2007). The figure cited is the gross cost, which is a more appropriate measure of government subsidy of prescription drug purchases.


39 Centers for Medicare and Medicaid Services, _National Health Expenditures by Type of Service and Source of Funds: Calendar Years 2005-1960_.

40 GAO, _Tax Expenditures Represent a Substantial Federal Commitment and Need to Be Examined_ 34 (Table 2) (Sept. 2005) (GAO-05-690).

41 Centers for Medicare and Medicaid Services, _National Health Expenditures by Type of Service and Source of Funds: Calendar Years 2005-1960_. The OECD estimate is higher, at 12.5% but includes other nondurable medical goods. OECD _Health Data_: 2007 (October 2007) available at [http://www.oecd.org/document/16/0,3343,en_2825_495642_2085200_1_1_1_1,00.html](http://www.oecd.org/document/16/0,3343,en_2825_495642_2085200_1_1_1_1,00.html) (pharmaceuticals and other nondurable medical as a percentage of total health expenditures).

42 Global Forum for Health Research, _Monitoring Financial Flows for Health Research_ 35 (Fig. 2.1) (2006).


2007. The US is the leading governmental contributor globally. Government science budgets also contain some health-related funding, which in some countries is quite substantial. In addition, private non-profit support has been valuable and influential, especially from the Bill & Melinda Gates Foundation, which has committed $7.8 billion to global health through the end of 2006. The private non-profit sector accounts for approximately 7% of global health research.

By comparison, the patent-based drug industry trade association reports that global biopharmaceutical R&D spending was $55.2 billion in 2006. Similar figures have been criticized as being possibly overstated. Relying indirectly on the industry-reported numbers, the Global Forum on Health Research estimates the total private for-profit R&D for health at $60.6 billion in 2003.

These estimates of global health R&D underestimate the true public contribution because they do not include indirect funds such as tax expenditures to support pharmaceutical R&D and additional periods of marketing exclusivity. These amounts can be quite significant. In the US, the R&D tax credit, pediatric testing exclusivity extension, and

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47 OECD, SCIENCE, TECHNOLOGY AND INDUSTRY SCOREBOARD 36-7 (2007).
49 Global Forum for Health Research, MONITORING FINANCIAL FLOWS FOR HEALTH RESEARCH 36 (Table 2.1) (2006).
50 Accenture, THE PURSUIT OF HIGH PERFORMANCE THROUGH RESEARCH AND DEVELOPMENT: UNDERSTANDING PHARMACEUTICAL RESEARCH AND DEVELOPMENT COST DRIVERS 4 (Figure 2.1.1) (2007).
54 26 U.S.C. sec. 41 (2007). The U.S. Treasury estimates the R&D tax credit was $4.630 billion in FY 2004, but did not separately report the portion awarded to the pharmaceutical industry. GAO Report, TAX EXPENDITURES REPRESENT A SUBSTANTIAL FEDERAL COMMITMENT AND NEED TO BE REEXAMINED 100 (Table 4., app. III) (GAO 05-690, Sept. 2005).
the Orphan Drug tax credit\textsuperscript{56} provide subsidies for qualifying research and clinical trial expenses. The US Possessions Tax Credit provided an additional benefit of $1.1 billion in 2003, most of which went to the pharmaceutical industry.\textsuperscript{57} For Merck, the size of its Possessions Tax Credit was dwarfed by the $1.024 billion amount saved through tax provisions that permit deferral of foreign income.\textsuperscript{58} Periods of marketing exclusivity are granted under existing US law for clinical trials data,\textsuperscript{59} pediatric testing,\textsuperscript{60} and orphan drugs.\textsuperscript{61} The cost of extending market exclusivity is unclear, but can easily exceed billions of dollars.\textsuperscript{62} The appropriate adjustments for these incentives may be conservatively estimated at no less than $15 billion globally, particularly when incentives from outside the US and reimbursement incentives are included.\textsuperscript{63} As adjusted, public investments in health R&D are probably significantly larger than private for-profit investments.

| Table 1. Estimated global health R&D, 2003 (billions)\textsuperscript{64} |
|----------------|----------------|----------|
|                | Direct  | Adjusted | %     |
| **Total**      | 125.8  | 125.8    |        |
| **Private for-profit** | 60.6   | 45.6     | 36%    |
| **Private non-profit** | 9.0    | 9.0      | 7%     |


\textsuperscript{57} Daniel S. Holik, \textit{U.S. Possessions Corporations Returns, 2003 Statistics of Income Bulletin} 113, 115 (Figure C) (Summer 2006) (the “pharmaceuticals and medicines” industrial group accounted for 53.1%).

\textsuperscript{58} Merck’s Possessions Tax Credit for 2006 was only $87 million. Merck & Co. Inc., FORM 10-K at n. 17, p. 114 (filed with the US Securities and Exchange Commission) (Feb. 28, 2007).


\textsuperscript{63} In its comments to the WHO IGWG, the US Government called for additional “tax credits to encourage research and development into medicines related to neglected or orphan diseases.” U.S. Government Comments on Annexes I and II of the World Health Organization (WHO) Secretariat’s Elements of a Global Strategy and Plan of Action [Document A/PHI/IGWG/1/5] [hereinafter, US Comments]. The US Comments do not appear in the document itself, but are found on the WHO IGWG website: \texttt{http://www.who.int/phi/submissions/USA-Comments.pdf}, at 8.

To a large extent, high-income country governments make the market for pharmaceuticals. Given this fact, separating the public and private contributions to pharmaceutical R&D becomes exceedingly difficult. But it is clear that direct measures of R&D greatly understate the public contributions through tax expenditures, regulatory exclusivity, and public reimbursement. The lion’s share comes from the public purse.

**Implications for LMICs**

The patent-based pharmaceutical R&D and distribution systems in high-income countries functions as well as they do in large part because of elaborate and expensive subsidy and social insurance mechanisms. Poorer countries generally lack these resources. They cannot afford multi-billion dollar NIH-style grant programs to focus attention on local health conditions. They do not subsidize the cost of the vast array of patented medicines to the point where they are affordable. Their citizens are much less wealthy and cannot afford most patented medicines. Global pharmaceutical markets simply don’t work as well for the world’s non-wealthy people, perhaps 85% of humanity. Special provisions for enhanced access to medicines and TRIPS flexibilities are called for in these situations, especially if access can be provided without undermining optimal incentives for innovation in high-income markets. Furthermore, the following section describes why disease-specific limitations are inappropriate.

**III. Global Disease Burdens**

While pharmaceutical markets vary significantly with the wealth of customers and governments, variations in global disease burdens call for careful analysis. As described above, attempts have been made to limit access initiatives and TRIPS flexibilities to specific diseases or categories, such as the “Big 3” infections diseases (AIDS/HIV, malaria and tuberculosis) or “public health emergencies.” Similarly, global drug companies have generally limited their differential pricing policies in LMICs to drugs treating AIDS, malaria and a small number of other drugs. An implicit assumption is

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65 Brazil has fully subsidized the price of AIDS medications as part of its aggressive treatment and prevention program. The high price had prevented Brazil from making similar commitments across other treatment categories. WHO CIPIH REPORT, at 97-100 (figure 4.3); Outterson & Kesselheim, at xxx. Brazil’s threatened compulsory licenses may have saved US$1 billion in AIDS treatment costs between 2001 and 2005. Amy S. Nunn, et al., *Evolution of Antiretroviral Drug Costs in Brazil in the Context of Free and Universal Access to AIDS Treatment*, 4 PLOS MEDICINE e305 (2007).


that these conditions represent the greatest disease burdens in LMICs. In fact, these infectious diseases are not the most significant drivers of disease burden in LMICs, where noncommunicable or chronic diseases play an increasingly significant role.\footnote{See, e.g., Roger S. Magnusson, \textit{Non-Communicable Diseases and Global Health Governance: Enhancing Global Processes to Improve Health Development}, 3 \textit{Globalization and Health} (May 22, 2007) available at \url{http://www.globalizationandhealth.com/content/3/1/2} (visited Dec. 27, 2007).}

The Global Forum for Health Research categorizes diseases and disease burdens in LMICs. Their system focuses on medical categories:

- Group 1: communicable diseases, maternal and perinatal conditions and nutritional deficiencies
- Group 2: noncommunicable conditions (NCDs), including cardiovascular disease, diabetes, cancer and mental and neurological conditions

In high-income countries, the great majority of burden of disease comes from Group 2; in LMICs, Groups 1 and 2 both account for large shares of the burden of disease.\footnote{Global Forum for Health Research, \textit{2 Global Forum Update on Research for Health} 11 (Fig. 3) (2005).}

Historically, some thought of Group 2 diseases such as heart disease as diseases of affluence and Group 1 diseases such as infant mortality and infections as diseases of poverty. But the diseases of affluence and poverty are converging. As the Global Forum for Health Research states:

“A long-standing stereotype has held that noncommunicable conditions are ‘diseases of affluence’ characteristic of developed countries, while developing countries mainly suffer from communicable diseases. It is clear that this no longer applies and that a major epidemiological transition has taken place: there is an almost equal level of BoD due to Group 1 and Group 2 for LMICs and a significantly higher rate of DALYs in LMICs due to injuries.”\footnote{Global Forum for Health Research, \textit{2 Global Forum Update on Research for Health} 11 (2005).}

The top ten causes of death and burden of disease in LMICs include several conditions that are also top killers in high-income countries, in addition to more “traditional” diseases of poverty:

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\caption{Burden of Disease in LMICs}
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<tr>
<td>1. Ischaemic heart disease</td>
<td>Ischaemic heart disease</td>
<td>Perinatal conditions</td>
</tr>
<tr>
<td>2. Cerebrovascular disease</td>
<td>Cerebrovascular disease</td>
<td>Lower respiratory infections</td>
</tr>
<tr>
<td>3. Lower respiratory infection</td>
<td>Chronic obstructive pulmonary disease</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>4. HIV/AIDS</td>
<td>Tuberculosis</td>
<td>Cerebrovascular disease</td>
</tr>
<tr>
<td>5. Perinatal conditions</td>
<td>Road traffic accidents</td>
<td>HIV/AIDS</td>
</tr>
<tr>
<td>6. Chronic obstructive pulmonary disease</td>
<td>Lower respiratory infections</td>
<td>Diarrhoeal diseases</td>
</tr>
<tr>
<td>7. Diarrhoeal diseases</td>
<td>Trachea, bronchus, and lung cancers</td>
<td>Unipolar depressive disorders</td>
</tr>
<tr>
<td>8. Tuberculosis</td>
<td>Stomach cancer</td>
<td>Malaria</td>
</tr>
<tr>
<td>9. Malaria</td>
<td>Diarrhoeal disease</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>10. Road traffic accidents</td>
<td>HIV/AIDS</td>
<td>Tuberculosis</td>
</tr>
</tbody>
</table>

Noncommunicable diseases (NCDs) are an increasingly significant problem in the developing world. As Lopez and Mathers note:

“Surprisingly, almost 50% of the adult disease burden in low- and medium-income countries is now attributable to noncommunicable disease. Population ageing and changes in the distribution of risk factors have accelerated the epidemic of noncommunicable disease in many developing countries.”

### IV. Markets and the Global Burden of Disease

The WHO CIPIH REPORT took a different taxonomic path to describe the global burden of disease, following the terminology of the Commission on Macroeconomics & Health

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73 Shah Ebrahim and Liam Smeeth, *Non-Communicable Diseases in Low and Middle-Income Countries: A Priority or a Distraction?*, 34 INT’L. J. EPIDEMIOLOGY 961, 962 (Table 2) (2005).


The CMH and the WHO CIPIH Report categorized diseases with a market-based approach, according to their intrinsic appeal to global capitalism, and in particular the markets for innovation and medicine.

**Type I Disease Innovations**

Type I diseases occur in high-income countries. The purchasing power of the high-income countries drives innovation for Type I diseases. Examples include cardiovascular disease, stroke, cancer, depression, and diabetes. These diseases may also be prevalent in LMICs, but the defining characteristic of Type I diseases is a strong market demand for treatment of high-income patients. SARS and pandemic influenza are also Type I disease markets. Innovation in Type I diseases can be sufficiently supported by high-income markets alone.

Some Type I diseases disproportionately affect people in LMICs. Take the example of cervical cancer. The WHO Commission listed cervical cancer as a Type I disease. In high-income countries, deaths from cervical cancer are relatively rare due to expensive population screening and treatment. About 260,000 women in developing countries die from cervical cancer each year, exceeding the deaths from all diseases in the tropical-disease cluster. A highly effective vaccine is now available to prevent most cases of cervical cancer, but the price – US$360 per person – exceeds the per capita annual health budgets for most of the women worldwide who need it. A relatively small number of deaths in high-income countries led to these two HPV vaccines that hold great promise in LMICs as well. These vaccines could be provided generically to the poorest without undermining optimal innovation. The deaths of less than 17,000 women per year in wealthy countries offered sufficient financial rewards to prompt both Merck and GlaxoSmithKline to spend hundreds of millions of dollars to bring HPV vaccines to market. The deaths of more than 222,000 poor women per year may have provided moral, scientific or humanitarian incentives to create HPV vaccines, but the potential financial rewards were modest, since these women can’t afford it. Merck has

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77 WHO CIPIH REPORT, at 13.
79 WHO CIPIH REPORT, at 14 (Tab. 1.3).
81 C.D. Mathers, A.D. Lopez, & C.J.L. Murray, Global Burden of Disease and Risk Factors (Table 3B.1) (Oxford/World Bank, 2006).
83 Outterson & Kesselheim, at xxx.
84 Outterson & Kesselheim, at xxx.
announced an equitable access program, and some limited donations, but the scope of the program remains unknown at the present.

**Type III Disease Innovations**

Type III diseases are overwhelmingly or exclusively incident in developing countries. Little or no global commercial market exists for Type III diseases. Examples include onchocerciasis (river blindness), leishmaniasis (kala-azar), Chagas disease, and African sleeping sickness.

Many have recognized the market failures inherent in Type III diseases. For these diseases, normal market conditions will be inadequate to stimulate sufficient R&D. Impoverished sick people are not attractive markets for global for-profit R&D programs. Type III disease innovation will require substantial non-market incentives, such as public private product development partnerships and market-making devices such as Advanced Market Commitments or patent prizes. Others look to non-market incentives such as grants and government-sponsored research. Occasionally proposals are coupled with an expansion of IP rights in poor countries, or a choice between exercising IP rights in either developed or developing countries, but not both. Expanded IP rights are an unnecessary and unwelcome addition for neglected disease research. Expansion of IP rights will not create incentives in the absence of money to

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87 WHO CIPIH Report, at 22 (“as is the case for diseases affecting millions of poor people in developing countries, patents are not a relevant factor or effective in stimulating R&D and bringing new products to market.”); see also Carl Nathan, *Aligning Pharmaceutical Innovation With Medical Need*, 13 *Nature Medicine* 304-308 (2007). For a review of the literature, see *Pharmaceutical Arbitrage*, at 244-50.
91 Aiden Hollis, *An Efficient Reward System For Pharmaceutical Innovation* (July 2, 2004) (unpublished manuscript, on file with author). [check to see if it is published now]
buy the product. These diseases are neglected due to the poverty of the afflicted, not the lack of IP rights.95

While Type III diseases are significant, we should note that total global deaths from the tropical-disease cluster in 2001 were only 128,000 people.96 Residents of LMICs suffer from higher infectious disease burdens, but much of the DALYs lost stems from noncommunicable diseases, injuries, and communicable diseases other than the tropical and neglected disease cluster.97

**Type II Disease Innovations**

Type II diseases occupy an intermediate category, sharing some characteristics of the other categories. LMICs suffer a disproportionately large burden from Type II diseases. Tuberculosis and malaria were once Type I diseases, but are now classified as Type II by the WHO after virtual eradication of malaria in the US and Europe, and a significantly lower disease burden from tuberculosis in high-income countries. Malaria is classified as Type II rather than Type III because it retains a small but significant financial footprint in the high-income countries to meet the needs of the military and international travelers. If multiple-drug resistant and extremely-drug resistant tuberculosis spread significantly in high-income countries, tuberculosis may regain Type I status.

Innovation in Type II diseases also occupies an intermediate category. In many cases, innovation for high-income markets will be sufficient to create the necessary drugs. Such was the case with AIDS and the existing treatments for malaria and tuberculosis. But the global medical burden of malaria and tuberculosis has outmatched the innovation spurred by relatively modest high-income country markets. Type II diseases will require additional non-market incentives to fully correlate global need with innovation incentives.98

The WHO Commission classified AIDS as a Type II disease,99 but that appears to be a debatable choice. AIDS is perhaps better classified as a Type I disease. While the greatest burden of AIDS disease falls outside of high-income countries, more than 2 million people are living with HIV in high-income countries and infection rates are rising.101 This high-income patient base is more than sufficient to spur innovation. The AIDS cases in the US and Europe sparked an avalanche of research, even before the true

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95 WHO CIPIH REPORT, at *Pharmaceutical Arbitrage*, at 22, 244-50; *Pharmaceutical Arbitrage*, at 244-60.
96 Mathers, et al., *GLOBAL BURDEN OF DISEASE AND RISK FACTORS*, at Table 3B.1.
97 WHO CIPIH REPORT, at 3-4, Table 1.1 & 1.2.
99 WHO CIPIH REPORT, at 14.
100 UNAIDS, *FACT SHEET: KEY FACTS BY REGION – GION Y ND APIDEUM UPDATE* (Nov. 2007) (estimating that 2.1 million people are living with HIV in high-income countries in North America, Western and Central Europe).
101 Gardiner Harris, *Figures on H.I.V. Rate Expected to Rise*, *NY TIMES* (Dec. 2, 2007) (reporting that estimates on US infection rates may be 50% higher than previously thought).
scope of the global crisis was known. AIDS may be considered a Type I disease at present, with the exception of adaptive research.

**Adaptive Innovations for Type I Diseases**

Additional incentives may be required to adapt Type I innovations to developing country conditions. Heat-stable formulations and fixed-dose combinations are examples of adaptive innovations for a Type I disease (AIDS). Simpler and cheaper diagnostics are required for resource-constrained settings. Geographic variations in HPV subtype incidence might require additions to the cervical cancer vaccines. All of these are examples of adaptive innovation for Type I diseases. In the language of the WHO DRAFT GLOBAL STRATEGY (2007), these are “needs of developing countries in relation to Type I diseases.” Some of this adaptive innovation may come from drug companies located in developing countries, where cost structures are lower and researchers may be closer to the ground. Other adaptive innovations may require non-market incentives, similar to other neglected disease issues.

**Important Distinctions Between Markets for Innovation and Medicine**

The WHO typology is helpful for analyzing differences in the markets for innovation and medicine between high-income countries and LMICs. Disease-specific incentives are required for innovation market failures in Type II and III diseases, but limitations are not appropriate for access programs and TRIPS flexibilities. The relevant factors are summarized in Table 3 below:

**Table 3. Markets for innovation and medicines, by disease type and income level.**

<table>
<thead>
<tr>
<th>Type I</th>
<th>Innovation Market</th>
<th>Medicine Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>- HICs</td>
<td>High-income country purchasing power drives the market (ex: Lipitor for high cholesterol). Innovation follows purchasing power rather than medical need (ex: additional life style and me-too drugs rather than a first-in-class Gram-negative antibiotic).</td>
<td>Patent protection and sophisticated branding and marketing yield high drug prices. The impact of high prices is ameliorated by private and social insurance mechanisms, relatively high per capita incomes, and (in some cases) government monopsony procurement.</td>
</tr>
<tr>
<td>- LMICs</td>
<td>Adaptive R&amp;D may be needed to account</td>
<td>Patent-based pricing denies access to the</td>
</tr>
</tbody>
</table>

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102 WHO CIPIH REPORT, at 16-19, 44.
103 Outterson & Kesselheim, at xxx.
104 *Pharmaceutical Arbitrage*, at 234.
107 WHO CIPIH REPORT, at 45.
for resource-constrained settings (ex. non-refrigerated vaccines, polyvalent HPV vaccines, fixed-dose combinations). Regional companies may be able to supply some adaptive R&D. The balance must be provided through non-market incentives. Majority of direct purchasers. Robust generic competition would drive prices closer to marginal cost (ex. unlicensed AIDS drugs). LMIC governments and donors have limited ability to subsidize access (cf: Thailand & Brazil’s AIDS programs).

### Type II

#### HICs
Largely ignored by high-income markets, except by tourists, military and other modest markets (ex: prophylaxis for malaria). Patented Type II innovative medicines are generally limited to HIC citizens who are residents in LMICs (ex: military, tourists, expats, wealthy local elites).

#### LMICs
Adequate levels of innovation require additional R&D support from non-market incentives (ex: malaria vaccine) LMIC governments and donors have limited ability to subsidize access. Best medical practice may require significant subsidies to prevent resistance to communicable diseases (ex: subsidies for ACTs for malaria).

### Type III

#### HICs
No market in HICs. No medical need in HICs.

#### LMICs
These very neglected diseases require non-market incentives to support innovation. Significant unmet medical need in LMICs.

## V. Disease-Specific Limitations in the WHO IGWG

With this background, we now turn to the current discussions within the WHO IGWG concerning disease-specific limitations. The December 14, 2007 draft of the WHO DRAFT GLOBAL STRATEGY (2007)\(^{108}\) frequently uses the following disease-limiting phrase or its permutations: “diseases which disproportionately affect developing countries.”\(^{109}\) The phrase was prominently discussed in the WHO CIPIH REPORT,\(^{110}\) and was mentioned in the World Health Assembly Resolution that established the IGWG.\(^{111}\) The phrase is occasionally used as an apparent synonym for Type II and III diseases.

### The US Position

The United States Government appears to consider the phrase as a limitation on access programs. In the US COMMENTS to the WHO ELEMENTS OF A GLOBAL STRATEGY (2006), the United States claimed that the IGWG’s mandate was limited to Type II and III diseases:

> “The IGWG should not consider Recommendation 2.4 as the focus of its

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\(^{109}\) WHO DRAFT GLOBAL STRATEGY (2007), at 3, par. 3 (consensus text), par. 4 (bracketed text, consensus pending decision by USA), at 4, par. 13 (with bracketed text), par. 14 a) (consensus text), par. 14 b) (consensus text, except for omitted footnote).

\(^{110}\) WHO CIPIH REPORT.

\(^{111}\) WHA 59.24.
work should be on diseases that disproportionately affect developing countries, more commonly referred to as Type II and Type III diseases.\footnote{US COMMENTS, at 2.}

The United States was commenting on Recommendation 2.4 from the WHO CIPIH Report, which explicitly included Type I diseases in its ambit:

\begin{quote}
When addressing the health needs of people in developing countries, it is important to seek innovative ways of combating Type I diseases, as well as Type II and Type III diseases. Governments and funders need to assign higher priority to combating the rapidly growing impact of Type I diseases in developing countries, and, through innovation, to finding affordable and technologically appropriate means for their diagnosis, prevention and treatment.\footnote{WHO CIPIH REPORT, at 48 (Recommendation 2.4).}
\end{quote}

Other actions by the US Government have attempted to limit IGWG consideration of TRIPS flexibilities, especially with regard to Type I diseases. For example, the WHO CIPIH REPORT\footnote{WHO CIPIH REPORT, at 22.} and the World Health Assembly Resolution 59.24\footnote{WHA 59.24, at par. 2(4).} supported the use of TRIPS flexibilities by developing countries. The WHO ELEMENTS OF A GLOBAL STRATEGY (2006) included the following “areas for action:”

\begin{quote}
6(a) enact legislation in developed and developing countries for application of the flexibilities provided for in TRIPS and other international agreements

6(f) assure that bilateral trade agreements do not seek to incorporate “TRIPS-plus” protection in ways that might reduce access to medicines in developing countries

6(i) focus on specific aspects of the intellectual property system, such as test data exclusivity, “me-too” patents, and patent linkages

7(i) take necessary legislative steps in developed countries, and other countries with manufacturing and export capacity, to allow compulsory licensing for export consistent with the flexibilities provided for in TRIPS

7(j) provide in national legislation for measures to encourage generic entry on patent expiry, such as the “early working” exception, and more generally policies that support greater competition between generics,
\end{quote}
whether branded or not, as an effective way to enhance access by improving affordability; restrictions should not be placed on the use of generic names.”

The US COMMENTS requested that these discussions of TRIPS flexibilities be excluded from the WHO IGWG process:

“Accordingly, the IGWG should not consider Subsection (a) of Paragraph Six of the document. The WHO Secretariat should not expand its work on matters better addressed by another international organization. Therefore, the IGWG should not consider Subsections (f) and (i) of Paragraph Six of the document, because they more appropriately fit within the scope and mandate of the WTO and WIPO.”

“While Subparagraph (j) of Paragraph Seven is important when balanced with incentives to develop new drugs, neither subparagraph (i) or (j) are appropriate areas of action for the WHO Secretariat; thus the IGWG should not consider them.”

The US Comments are thus making a narrow, technocratic argument that the WHO is an inappropriate forum for discussing the intellectual property rights issues relating to access to medicines. They are trying to prevent discussion in a forum that might actually give some weight to global health. This argument ignores the history of the IGWG process, which was designed to offer a balanced, integrated analysis of intellectual property rights, innovation and public health. Each step of this process has highlighted all three issues: The WHO Commission on Intellectual Property Rights, Innovation and Public Health; the WHO CIPIH Report entitled Public Health, Innovation & Intellectual Property Rights; and the WHO IGWG on Public Health, Innovation and Intellectual Property. The WHO is not claiming exclusive jurisdiction over these issues, merely the opportunity to speak to issues which impact global public health.

**Disease-Specific Limitations Are Not Appropriate**

Nothing in the TRIPs Agreement or the *Doha Declaration* limits access programs or TRIPS flexibilities to Type II and III diseases. Neither does the WHO CIPIH Report, which cannot be read as arguing for any such restriction.

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117 US COMMENTS, at 4-6, pars. 7-8. The US COMMENTS suggest that the WTO and WIPO are the better fora.
118 US COMMENTS, at 5, par. 6.
119 US COMMENTS, at 5, par. 7.
The phrase “diseases which disproportionately affect developing countries” is best understood as an explanation for why the market has failed to produce medicines for neglected (Type II) or very neglected (Type III) diseases: diseases which occur disproportionately in poor people in LMICs are not an attractive market for the patent-based drug industry. As the WHO CIPIH REPORT concluded:

“Too few R&D resources are directed to the health needs of developing countries. In the private sector, companies do not have the incentive to devote adequate resources to develop products specifically adapted to the needs of developing countries, because profitability is mainly to be found in rich country markets. The great majority of health research funded by the public sector, takes place in developed countries, and its priorities principally reflect their own disease burden, resource position and social and economic circumstances.”

Difficulties with the US position are made more evident when one attempts to construct a list of qualifying diseases. The adverb “disproportionately” appears to require that incidence on a per capita basis be significantly higher. Surely the list includes all Type III diseases, including the very neglected tropical diseases, for by definition the per capita incidence is almost exclusively in LMICs. Similarly, the largest Type II diseases such as malaria and tuberculosis appear to qualify. For all of these diseases, markets are unable to stimulate the R&D required for global health.

AIDS presents a more troublesome case. The incidence and burden of AIDS falls disproportionately on sub-Saharan Africa, but the same may not hold true for India or China. As discussed above, AIDS may not be properly classified as a Type II disease at all, and its incidence is rising in the United States.

Other infectious diseases are quite common in LMICs, and result in a substantial burden of disease there. In general, the incidence of infectious diseases falls disproportionately in LMICs, but significant medical need exists also in high-income countries for many infectious diseases.

Most noncommunicable or chronic diseases would probably not qualify. While heart disease, depression, stroke, and diabetes are certainly major contributors to the burden of disease in LMICs, they do not impose a disproportionately higher per capita burden. If the phrase “diseases which disproportionately affect developing countries” is considered

120 WHO CIPIH REPORT, at 172.
121 See supra, section ____.
a limitation on access programs and TRIPS flexibilities, then almost all chronic and noncommunicable diseases must be excluded.

Clearly, this is not an acceptable result. This interpretation is without support in the WHO CIPIH REPORT, and is at odds with the mandate of the WHO IGWG. The Report does not limit access programs or TRIPS flexibilities to specific diseases. In fact, it recommended exactly the opposite. Recommendations 4.13 to 4.27 are primarily concerned with encouraging developing countries to take advantage of TRIPS flexibilities and other laws in order to protect public health, without any limitations as to disease. Recommendation 4.7 specifically includes noncommunicable diseases:

“4.7 For noncommunicable diseases, governments and companies should consider how treatments, which are widely available in developed countries, can be made more accessible for patients in developing countries.”

The phrase is relevant only as a descriptive term, identifying innovation market failures: patent-based pharmaceutical innovation doesn’t work for diseases which disproportionately affect developing countries. Global markets under perform commercial research into Type II, Type III diseases and adaptive research for Type I innovations for resource-constrained settings. No substantial market in high-income countries exists for these disease conditions, necessitating various non-market mechanisms in order to facilitate innovation. By definition, these conditions disproportionately affect developing countries; otherwise they would be Type I innovations.

But the innovation gap is not the only problem facing the IGWG. Its terms of reference also include ensuring equitable access to patented innovations treating all diseases, including Type I, II and III diseases. The market for medicines and the market for innovation must both be valued. WHA 59.24 urges member states:

“To work to ensure that progress in basic science and biomedicine is translated into improved, safe and affordable health products – drugs, vaccines and diagnostics – to respond to all patients’ and clients’ needs, especially those living in poverty, taking into account the critical role of gender, and to ensure that capacity is strengthened to support rapid delivery of essential medicines to people;”

VI. Conclusion

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123 WHO CIPIH REPORT, at 180-82.
124 WHO CIPIH REPORT, at 180.
125 WHA 59.24 par. 2(3).
The pharmaceutical IP system works well in high-income countries able to afford government subsidies and social insurance. It does not work for the poor in low- and middle-income countries. For the market for medicines, governments should fully utilize all TRIPS flexibilities to protect the health of their citizens, without regard to the type of disease. In particular, LMICs must be permitted to confront the growing burden of chronic diseases by using TRIPS flexibilities for any type of disease, including Type I. The phrase “diseases disproportionately affecting developing countries” is in no way a limitation on the utilization of TRIPS flexibilities to improve the market for medicines in WTO Member countries. Rather, it is an important reminder of a weakness in the market for innovation; global commercial markets will not invest sufficient amounts in diseases that disproportionately affect developing countries.