

Where Have All the Donors Gone? Scarce Donor Funding for Non-Communicable Diseases

Rachel A. Nugent and Andrea B. Feigl

Abstract

Health conditions in developing countries are becoming more like those in developed countries, with non-communicable diseases (NCDs) predominating and infectious diseases declining. The increased awareness of changing health needs, however, has not translated into significant shifts in resources or policy-level attention from international donors or governments in affected countries. Driven by changes in lifestyle related to nutrition, physical activity, and smoking, the surging burden of NCDs in poor countries portends painful choices, particularly for countries with weak health systems that are struggling to manage persistent infectious disease burdens and to protect the poor from excessive out-of-pocket expenses.

Global development assistance for health (DAH) was estimated at \$21.8 billion in 2007 (Ravishankar et al., 2009). A recent assessment shows that official development assistance for health reached \$26.4 billion in 2008, surpassing all prior years (Kates et al., 2010). No specific mention is made of DAH for NCDs in developing countries in either study. This paper aims to fill that gap.

We conducted an analysis of donor spending on NCDs in developing countries from 2001 to 2008 that reveals that less than 3 percent (\$503 million out of \$22 billion) of overall DAH was dedicated to NCDs in 2007. The amount of donor assistance for health rose to \$686 million in 2008. In terms of the burden of disease, donors provided about \$0.78/DALY attributable to NCDs in developing countries in 2007, compared to \$23.9/DALY attributable to HIV, TB, and malaria. If donors provided just half the support to avoid NCD DALYs that they provide to the three infectious diseases, it would amount to almost \$4 billion in DAH for NCDs.

The picture of donor involvement in NCDs is not entirely bleak. Donor funding to developing countries for NCDs grew by 618 percent between 2001 and 2008, with the largest increase coming from private, non-profit donors, and evidence of accelerating interest from bilateral donors. Multilateral organizations remain the largest category of funders. Nonetheless, additional donor funding is needed to support developing-country efforts to incorporate NCDs into their existing health care programs through such mechanisms as hypertension and cancer screening and prevention programs, and proven policy solutions such as tobacco taxation and salt reduction.



Center
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Development

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Working Paper 228
November 2010

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CGD is grateful for contributions from PepsiCo in support of this work.

Rachel A. Nugent and Andrea B. Feigl. 2010. "Where Have All the Donors Gone? Scarce Donor Funding for Non-Communicable Diseases." CGD Working Paper 228. Washington, D.C.: Center for Global Development.

<http://www.cgdev.org/content/publications/detail/1424546>

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Glossary

ADB	Asian Development Bank
AFDB	African Development Bank
BOD	Burden of Disease
NCDs	Non-communicable diseases
CE	Cost-effectiveness
CRS	Creditor reporting system
DALY	Disability-adjusted life year
DM	Diabetes mellitus
GBD	Global burden of disease
IDB	Inter-American Development Bank
IDs	Infectious diseases
LMIC	Low- and middle-income country
MDG	Millennium Development Goal
NIH	National Institutes of Health
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OxHA	Oxford Health Alliance
PAHO	Pan American Health Organization
QALY	Quality-adjusted life year
TB	Tuberculosis
WB	World Bank
WHO	World Health Organization
YLL	Years of life lost

“Non-communicable diseases, health systems strengthening and prevention are extremely urgent for our region (Western Balkans and Central Asia). It has been virtually impossible for us to find funding sources in the foundation and corporate sector (let alone government).” — Health NGO

“Only 0.36 to 1.46 percent of WHO allocations in Pakistan have been earmarked for NCDs over the last 8 years. There is no official development assistance (ODA) from any source for NCD prevention and control in Pakistan, except for the contribution by WHO.” — Nonprofit foundation, Pakistan

1) Introduction

Researchers and policymakers in developing countries are bringing attention to the gap between donor funding for non-communicable diseases (NCDs) and the disease prevention and care requirements of poor populations. Recent studies point to low treatment rates (35 percent) but high prevalence rates (74 percent) of NCDs in South Africa (Goudge et al., 2009), high rates of non-communicable disease but insufficient health infrastructure to deal with them in Nigeria (Uwakwe et al., 2009), greater than 50 percent of registered deaths from NCDs in Peru (Huicho et al., 2009), and rural Bangladesh’s 3,500 percent increase in heart disease in the past 20 years (Karar et al., 2009). The picture of epidemiological transition is clear. No longer are NCDs in developing countries a problem to deal with later. There is a current, substantial, unmet need to address NCDs in poor countries, preferably with approaches that simultaneously reduce other sources of ill-health.

These voices have not yet been heard by the international donor community, whose inertia in responding to NCD problems and continued emphasis on communicable disease deters developing countries from adapting their health and broader governmental systems – regulatory and tax policies, public works and planning departments, education, agricultural and food policies – to a new set of health risks. The persistence of vertical donor programs aimed at a specific disease or sub-population also discourages a more holistic understanding of patient risks and health care needs (Frenk, 2009).

This paper examines donor funding for NCDs in developing countries since 2001. In addition to ascertaining trends and funding levels for NCDs as comprehensively as possible, our objective is to examine donor funding for NCDs in the context of current discussions about development assistance for health (DAH) allocations. We also provide a limited comparison of NCD funding to overall health and disease-specific funding levels from donors. The main question answered by the paper is the following:

- What are the trends in donor resources to address the non-communicable disease burden in developing countries?

We also briefly address the following issues to stimulate dialogue about the donor role in addressing the NCD burden in developing countries:

- What considerations inform donors' decisions about global health funding and how does NCD funding fit in?
- What economic arguments support donor attention to NCDs?

By attempting to draw the attention of policymakers and donors to NCDs, we do not hope to divert attention from infectious diseases. We encourage a debate on how to better balance global health funding to meet the needs of low- and middle-income countries, including through integrating NCD health services in developing countries into existing service delivery and financing mechanisms. The responsibility for these tasks is shared among donors, global health advocates, and, foremost, developing countries seeking help to respond to the growing double burden of disease.

2) Trends in NCD Prevalence and Risks in Developing Countries

The evidence supporting a shift in donor emphasis in global health has become widely known. Non-communicable diseases (diabetes, heart disease, cancer, obesity, sense organ diseases, and mental disorders) are no longer a problem affecting only wealthy countries, and they are here to stay.¹ No matter what the measure—rank order, proportion, DALYs, or deaths—NCDs do and will continue to exceed infectious diseases in developing countries. Eighty percent of NCD deaths worldwide occur in developing countries. Table 1 shows that in 2008, NCDs (Type II diseases) contributed 48 percent to morbidity in developing countries compared to a 39 percent contribution from infectious diseases (Type I diseases) and caused 59 percent of mortality compared to 31 percent from infectious diseases (World Health Organization, 2008a; Table 1). Both the number of deaths and the morbidity burden of NCDs are expected to increase in absolute and relative terms compared to infectious diseases. In 2030, NCDs will cause 74 percent of mortality and 64 percent of morbidity in low- and middle-income countries (LMICs), according to projections from the World Health Organization (2008a).

¹We use “non-communicable diseases” to refer to Type II diseases as classified by the WHO. These diseases are also commonly referred to as chronic diseases. We do not include HIV/AIDS in our definition of chronic diseases. It is included in WHO's Type I category of infectious diseases.

Table 1: Number and Proportion of Types I and II Deaths and DALYs in LMICs, 2008–2030 Projections (World Health Organization, 2008a).

	2008	2015	2030
# deaths Type I diseases	15mill (31 percent)	13mill (25 percent)	8mill (15 percent)
# deaths Type II diseases	30mill (59 percent)	33mill (64 percent)	42mill (74 percent)
DALYs, Type I diseases	518mill (39 percent)	427mill (33 percent)	267mill (22 percent)
DALYs, Type II diseases	647mill (48 percent)	690mill (53 percent)	792mill (64 percent)

Note: Type III diseases (accidents and injuries) comprise the remainder.

Table 2 ranks causes of mortality in developing countries in 2004 and projected for 2030 (World Health Organization, 2008a). If these projections are realized, lower respiratory infections and HIV will be the only infectious diseases remaining among the top ten causes of death two decades from now.²

Table 2: Leading Causes of Deaths in LMICs for 2004 and 2030, in LMICs Baseline Scenario (World Health Organization, 2008a)

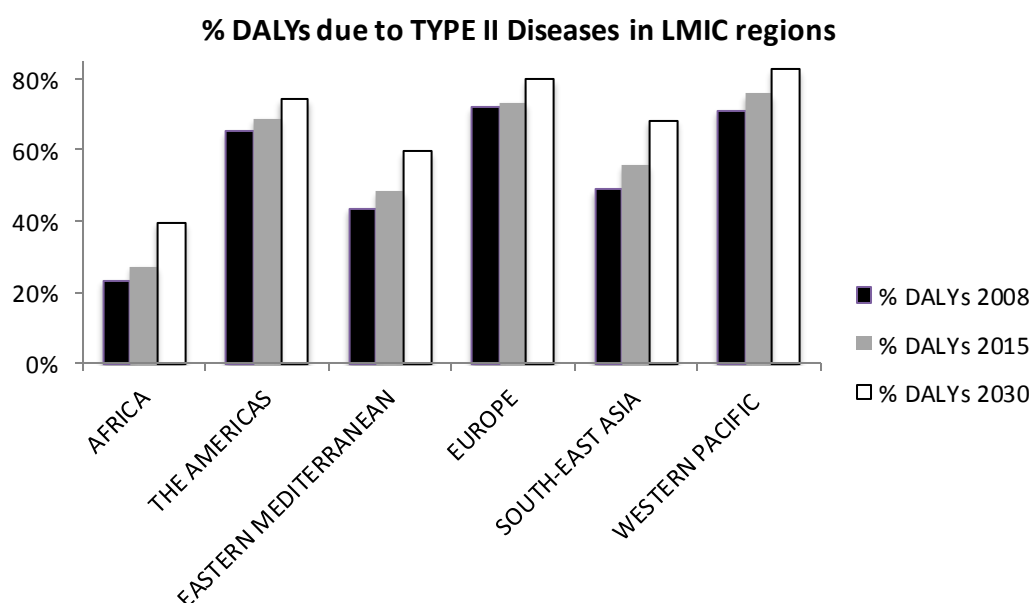
Disease Or Injury	2004 Rank	2030 Rank	Change in Rank
Ischaemic heart disease	1	1	0
Cerebrovascular disease	2	2	0
Lower respiratory infections	3	4	-1
Chronic obstructive pulmonary disease	4	3	+1
Diarrhoeal diseases	5	17	-12
HIV/AIDS	6	9	-3
Tuberculosis	7	19	-12
Prematurity and low birth weight	8	20	-12
Road traffic accidents	9	5	+2

² These numbers are based on baseline projections of mortality and morbidity, and the underlying assumptions of the models are listed in the appendix of the referenced paper by Mathers & Loncar, 2006.

Neonatal infections and other conditions	10	16	-6
Other unintentional injuries	11	11	0
Diabetes mellitus	12	6	+6
Malaria	13	33	-20
Birth asphyxia and birth trauma	14	25	-11
Trachea/bronchus/lung cancers	15	7	+8

NCDs are projected to increase, both absolutely and relatively, in all LMIC regions.³ Figure 1 shows the projected increase in share of disease due to NCDs in all low- and middle-income countries (LMIC) by WHO region between 2008 and 2030. In all regions except Africa, NCDs are projected to be more than 50 percent of the burden of disease by 2030.

Figure 1: Projections of Percentage of Disability Adjusted Life Years due to NCDs in Low and Middle Income Regions of the World from 2008 – 2030. (World Health Organization, 2008a)



The reasons for the growing absolute and proportional burden of NCDs are, paradoxically, both inevitable and preventable. They include a decline in mortality from infectious diseases, childbirth, and malnutrition, but also an increase in unhealthful lifestyles; and they reflect an aging global population and the know-how to increase longevity. In short, the rise in NCD mortality reflects both demographic and epidemiological transitions, which are occurring at different rates across countries and regions (Mathers & Loncar, 2005; Mathers & Loncar, 2006).

³ Mortality trends are similar to those shown for DALYs.

There are important differences between rich and poor countries in how these two transitions are being experienced. First, NCDs typically strike people in poor countries at a younger age than in wealthy countries. Almost half of NCD deaths in LMICs occur in people under 70 years of age (Lopez et al., 2006), and 25 percent of all NCD deaths occur in people under the age of 60.⁴ As a consequence, diabetes, cancers (especially lung cancer), and heart disease are not only posing a burden on developing-country health systems, but are affecting their economic development potential through reduced productivity and increased health care costs. The costs to developing countries at the macroeconomic level are starting to be documented, and are likely still largely avoidable. The microeconomic effects at household and individual levels are negative through both income and expenditure pathways (see IOM, 2010 for a recent review of economic impacts of NCDs in developing countries).

Second, because many poor countries continue to struggle with high infectious and nutritional disease burdens, the rise in NCD prevalence confronts them with serious and stark choices in health resource allocation. Continuing on the current epidemiological path means potentially facing staggering health system demands in the future; changing course to address this looming health threat may mean diverting resources from pressing current priorities. A growing literature on cost-effectiveness of NCD interventions in developing countries will allow governments and donors to make informed choices (DCPP 2006, IOM 2010).

3) Role of Donor Funding for NCDs

Donors exert a powerful influence over what health needs receive attention in developing countries, not only through direct funding but also by signaling priorities in international and regional fora. A number of enduring myths about NCDs deter donor (and, to a lesser degree, national government) attention from them in poor countries. These include the perceptions that NCDs predominate only in rich countries, that they are consequences of personal choices or an inevitable result of aging, and that they and cannot be cost-effectively controlled. The economic arguments for demolishing some of these myths are discussed in the box, next page.

Persistently low funding for non-communicable diseases calls into question whether the “need” is sufficiently captured—or even convincing—in descriptions of NCD’s share of the global burden of disease. Disease mortality and subsequently DALYs have often been treated as the undisputed metrics for defining health needs by the global health community, but donors and developing-country governments do not determine their spending to correspond. Clearly, the disease burden is only one of many factors influencing donor priorities (see Shiffman, 2009, for a full discussion of those factors.)

⁴ In contrast, in developed countries, 14 percent of all NCD deaths occur below age 60, and about one-third of NCD deaths occur below age 70.

Economic Rationale for public support of NCD care and services.⁵

Economic efficiency arguments are frequently offered in support of government provision or financing of health care for infectious diseases. These arguments are based on market failure: negative externalities should be reduced to limit infectious disease transmission, and public goods should be provided, such as vaccination, health education, etc. The need for public intervention to redress market failures in the case of NCDs is less clear and far less accepted, especially by economists.

Yet there exists an externality case for public intervention to prevent and respond to NCDs. Both biological and social externalities arise from NCD-related behaviors. The most obvious biological example is smoking, where the smoker not only jeopardizes her/his own health, but the health of people in close proximity. Less visible, but perhaps of greater importance for development, research has established that low birth weights and eating behavior of mothers can put a fetus at greater risk of developing a chronic disease in adulthood (reviewed in Le Clair et al., 2009). This could be considered an externality imposed by the mother's health behavior or condition.

Additional types of social and ecological externalities that derive from NCD risks are beginning to be considered. The built environment (urbanicity) (Allender et al., 2008), behavior of peers (an individual is 60 percent more likely to become obese if a friend becomes obese) (reviewed in Bornstein et al., 2008), parental influences, and obesogenic environments (the lack of affordable fresh fruits and vegetables, playgrounds, and exercise facilities) have been associated with the development of chronic illness in individuals (reviewed in Stuckler, 2008) and may suggest a rationale for public intervention. A growing literature from behavioral economics shows that individuals, even if aware of future consequences of irrational behavior (i.e., smoking or overeating), will often favor immediate gratification of their senses at the expense of long-term interests (Stuckler, 2008; Sassi & Hurst, 2008). Governments can help to direct individual behavior to align with positive future outcomes by through tax policies and other financial incentives.

A second economic rationale for public intervention to reduce NCDs derives from public good characteristics. Governments often support the creation and provision of health knowledge, both through research funding and public health messaging. These types of information provision are classically underprovided by the market, especially in the area of disease prevention. Multiple surveys have demonstrated a low level of public knowledge about the risk factors of NCDs, and that information is asymmetrically distributed among income groups, especially in LMICs. For instance, people in the poorest income quintile in India have the highest

⁵ The economic arguments regarding public interventions for NCDs (especially for those pertaining to lifestyle issues of tobacco use and obesity) are discussed in more detail in a separate literature (Sassi & Hurst, 2008; Philipson & Posner, 2008; Nugent, 2007; Suhrcke, 2005).

smoking rates,⁶ yet are unaware of the consequences and of the addictive effects of tobacco (Gupta, 2006).

Numerous studies have documented the adverse economic impacts of NCDs in developing countries (Suhrke et al., 2006; Abegunde et al., 2007, Nugent, 2008). These effects vary across countries but are believed to rise with the prevalence of NCDs. Therefore, a third economic argument for public intervention derives from a need to mediate the microeconomic impacts on individuals and households, as well as potential adverse macroeconomic effects through income distribution and poverty (IOM, 2010). In particular, there is a disproportionate impact of NCDs on working-age people in developing countries.

These economic justifications may not be as obvious or as urgent as interventions to control an infectious disease, such as a pandemic, but they justify serious consideration of some level of public effort to prevent and manage NCDs.

Donor funding plays a particularly important role in health systems of low-income countries, where almost one in every six dollars spent on health comes from external sources (World Health Organization, 2009; Farag M. et al., 2009). Figure 2 shows that in the lowest-income countries in 2005, an average of 14.5 percent of health funding consisted of donor contributions, which is an increase from 11.1 percent in 2001. In a few countries, external resources contribute as much as 40–50 percent of total health expenditures (World Health Organization, 2009).

⁶ Based on research on NCD prevalence among different income quintiles, a strong case can be made for public intervention based on the equity principle, as the poorest suffer from the greatest burden and bear the greatest economic hardship when faced with treatment costs and lost productivity and income.

Figure 2: External resources as percentage of total expenditure on health
(World Health Organization, 2009a)



Development assistance for health (DAH) has grown over the past decade, and was recently estimated at \$21.8 billion in 2007 (Ravishankar et al., 2009). Almost one-third of the total (\$6.3 billion) was allocated to infectious diseases (HIV/AIDS, Malaria, TB); roughly one-third to health sector support, and one-third was not specifically designated. Official development assistance (ODA) for health was reported to be \$23.4 billion for 2007 (Kates et al., 2009). This figure includes only official government sources, but also is more broadly defined, and is therefore not comparable to overall DAH. In 2008, overall health ODA rose to \$26.4 billion (Kates et al., 2010).

Multiple analyses of disease burdens in developing countries show that donor funding is not allocated in proportion to the burden of disease, either globally or at the country level (Ravishankar et al., 2009; Sridhar & Batniji, 2008; Stuckler et al., 2008; Yach & Hawkes, 2005; World Health Organization Maximizing Positive Synergies Collaborative Group, 2009; Nishtar, 2009). Yet advocates and analysts alike often look to the burden of disease as an important signal to guide resource allocations towards specific diseases or population groups (Sridhar & Batniji, 2008; Stuckler et al., 2008).

Donor funding for NCDs is no exception. The startling rise in mortality and morbidity from NCDs is the dominant argument used by advocates for drawing attention and resources to their cause, in contrast to the moral and public health reasons relied on by infectious disease advocates (Leeder et al., 2004; Beaglehole et al., 2007). A reappraisal of DAH allocations that would more closely align spending with the burden of disease would result in higher priority accorded to NCDs, along with other high-burden neglected diseases (Shiffman, 2008.) However, the burden of disease argument has to date been met with lackluster response from donors and despair by developing-country governments who find little flexibility in donor priorities and in their own budgets.

Burden of disease is only one of the factors that should guide DAH spending. Others have presented impairment in economic productivity and GDP losses as an argument for greater attention to NCDs (IOM 2010, Suhrcke et al., 2006). Other criteria that should inform donor

spending include a country's financial capacity and overall foreign assistance need and the affordability and cost-effectiveness of proven interventions. Finally, more recent considerations such as aid coherence and harmonization, health systems strengthening, the possibility of crowding out national spending, and avoidance of verticality in funding where possible, are exerting a strong influence on donor and advocate strategies for DAH.

This paper does not set out to explore each of these criteria and how their application might alter donor funding priorities for health. However, calls for review and rationalization of the funding and institutional arrangements in global health reverberate in hallways and journals (Beaglehole et al., 2007; Szlezák et al., 2010). Future analysis might use the above-listed criteria to develop appropriate indicators with which to compare diseases for the purpose of guiding DAH funding allocations, in accordance with the Paris Declaration and the Accra Agenda. Each of the above criteria warrants detailed analysis of conditions across specific disease and health topics, and some are already well explored in the NCD literature (for cost-effectiveness, see DCPD 2006, Gaziano et al., 2007, Lim et al., 2007).

Our conclusion is that donors have both an opportunity and an obligation to scrutinize and utilize more sophisticated metrics than burden of disease in making DAH allocations, both to optimize the multiple (sometimes competing) goals of their health spending and to achieve greater aid effectiveness in this new era of health needs. A place to start is with a clear view of what is (and is not) being addressed by donors concerned about global health.

4) Literature Review

Determining the sources and uses of DAH is a painstaking and ultimately inconclusive task because of gaps and nonharmonized data collection (CGD, 2007), and NCDs as a category have so far been omitted from ongoing donor resource tracking exercises, such as the OECD/DAC/CRS database. Several earlier studies confirm that DAH (both for health services and for research) has been heavily skewed toward infectious diseases (Sridhar & Batniji, 2008; Stuckler et al., 2008; Yach & Hawkes, 2004).⁷ These analyses examine NCD funding from different sources, including major global health donor organizations, WHO, and other multilateral organizations.

Yach & Hawkes (2004) investigate funding from multilateral organizations for NCDs from 1995 to 2001. They find that WHO spending on NCDs (excluding funding for tobacco and mental health) was less than 3 percent of the WHO budget. Between 1997 and 2002, the World Bank's spending on NCDs amounted to 2.6 percent of loans in health, population, and nutrition (\$109.5 million out of \$4.24 billion).

In a more recent paper, Stuckler et al., examine WHO funding from 1994/95 to 2006/07, concluding that in 2006/07, the WHO "allocated 12 percent of its total budget to non-communicable diseases, 87 percent to infectious diseases and less than 1 percent to injuries and

⁷ In the published literature on health donor funding, only these studies explicitly mention NCD funding. A brief summary of these and other international health funding analyses is provided in Appendix 1.

violence” (Stuckler et al., 2008).⁸ In 2008, Sridhar and Batniji analyzed the spending patterns of the four largest global health donors: the World Bank, the Bill and Melinda Gates Foundation, the U.S. government, and the Global Fund to Fight AIDS, Tuberculosis and Malaria. They conclude that donor spending in 2005 was US\$3 per annual death from NCDs versus \$1030 per annual death from HIV/AIDS (Sridhar& Batniji, 2008).

NCDs in developing countries are not only neglected in terms of funding. Until recently, there has been relatively research and policy debate on the topic, particularly originating in the developing countries. In the economics literature, only 5 percent of health economics articles published between 1990 and 2005 focused on NCDs, compared to 47 percent that focused on HIV/AIDS, 35 percent on injuries, and 13 percent on maternal and child health and HIV/AIDS (Behrman et al., 2009). Furthermore, the NCD issue has been examined within a rich-country setting until recently. Across all scientific categories, developing-country authors produced less than 5 percent of all papers in all NCD categories between 1990 and 2003 (Yach & Hawkes, 2004). These knowledge deficits can be expected to change in the coming years with the creation of NCD research networks, such as the Global Alliance for Chronic Diseases and Community Interventions for Health.⁹

5) Scope and Methods

This paper examines donor funding for NCDs in developing countries from 2001 to 2008, as well as anticipated future levels. The purpose of ascertaining trends and funding levels for NCDs as comprehensively as possible is to identify the level of investment and interest that major donors are giving to the growing health problems caused by NCDs in developing countries, and second, to allow a comparison of non-communicable disease funding to overall health funding levels from donors, and to funding for other diseases. Donors are defined as both public and private sector, including profit and not-for-profit organizations. Departing from most analyses of donor funding, we also include major sources of funding for NCD research in developing countries. This paper updates earlier NCD donor studies, and also expands the range of donor organizations to include sources other than official (public-sector) donors.

A. Data Sources

We sought information about donor funding for NCDs from a variety of sources, including the following:

- Literature and funding database search

⁸A change in the WHO reporting format did not allow for a disease specific funding analysis after 2003.

⁹The [Global Alliance for Chronic Diseases](http://www.ga-cd.org/facts.php) was established in 2009 to coordinate research on prevention and treatment of chronic diseases (www.ga-cd.org/facts.php). [Community Interventions for Health](http://www.3four50.com/cih/about.php) is a multicenter, multisite intervention program for chronic diseases and their risks, established by the Oxford Health Alliance in 2005 (www.3four50.com/cih/about.php).

- CGD survey of donors and recipients
- Telephone interviews with key informants, donors, and recipients
- Analysis of WHO annual budgets
- World Bank and regional development bank program and spending analysis
- Foundation Center customized database search

We reviewed relevant literature for data sources and identified donor databases. We designed and conducted a detailed donor and recipient survey, using Survey Monkey, that was open to respondents for three months. In addition, we searched official databases of major bilateral and multilateral donors for NCD-specific projects, including the OECD/DAC/CRS; we also reviewed WHO and development bank budgetary documents. We followed up with phone calls and email inquiries where the databases and survey responses were ambiguous or too general. We made customized requests for information to the Foundation Center and through personal contacts in the NCD community. The full details of the data sources and collection methods are in Appendix II (Detailed methodology) and Appendix III (Foundation Center Search Protocol).

For the purposes of this paper, “non-communicable diseases” refers to all Type 2 diseases under the WHO classification of diseases (Table 3). This category is substantially more inclusive than what is often referred to in the NCD policy and advocacy literature, which generally focuses on the four major NCD causes of death: heart disease, diabetes, cancer, and chronic obstructive pulmonary disorder.

Table 3: WHO Type II Disease Categories

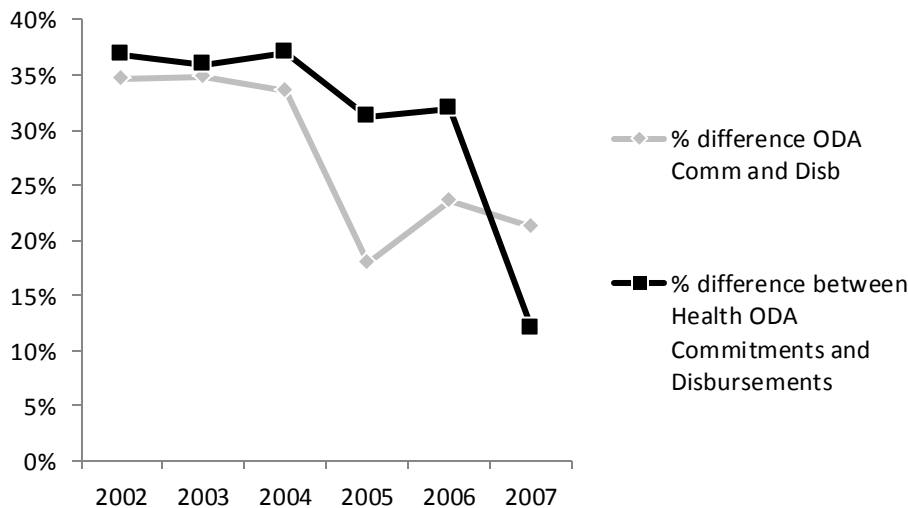
Category	GBD Cause Name
Neoplasms	Mouth and Oropharynx Cancer Esophageal Cancer Stomach Cancer Trachea, Bronchus, and Lung Cancer All other cancers
Diabetes mellitus	
Endocrine Disorders	
Neuropsychiatric Disorders	
Sense Organ Diseases	
Cardiovascular Diseases	Rheumatic Heart Disease Hypertensive Heart Disease Ischemic Heart Disease Cerebrovascular Disease Other CV Disease
Respiratory Diseases	Chronic obstructive pulmonary disease Other Respiratory Diseases
Digestive Causes	
Genitourinary Diseases	

Skin Diseases
 Musculoskeletal Diseases
 Congenital anomalies
 Oral Conditions

B. Calculating commitments versus disbursements

Most available funding databases report donor commitments but not disbursements. A few sources report both. We used this information to estimate commitments from donors that do not report them. We calculated an adjustment factor based on the six-year average of differences between disbursements and commitments (from 2002 to 2007) for all health grant records in the OECD/DAC Creditor Reporting System database.¹⁰ Where we were informed about a disbursement that fully corresponded to the commitment, we did not adjust the commitment amount. For funding amounts reported in foreign currencies, we converted using the [U.S. Treasury Foreign Exchange Rate](http://www.fms.treas.gov/intn.html) table (www.fms.treas.gov/intn.html). All funding amounts are reported in 2007 U.S. dollars.¹¹

Figure 3: Difference in commitments and disbursements for CRS reported ODA and health ODA



¹⁰ The average difference between commitment and disbursement is 28 percent for overall ODA, and 31 percent for health ODA in this time span (OECD, 2009). We used the figure of 31 percent to adjust our data.

¹¹ McCoy et al. used an adjustment factor of 27 percent to extrapolate disbursements from commitments (McCoy, Chand, & Sri dhar, 2009). Ravishankar et al. developed an algorithm to adjust for less than 100 percent coverage in the reporting of disbursements, and adjusted their reported disbursement numbers accordingly.

C. Data Limitations

Non-communicable diseases have not yet been granted their own category in official global health statistics, and identifying specific non-communicable disease funding is a difficult task, especially given the large share of funding from the private sector. Three types of challenges should be recalled when reviewing and drawing conclusions from the available information:

1. Incomplete Data Sources: Existing studies of NCD donor funding have focused on official sources and pathways of information, such as the OECD/DAC/CRS or direct budget information from WHO/PAHO. Most private health funding is not recorded in a central database, except for tax reporting of U.S.-based philanthropic foundations. Funding from non-profit organizations based outside the United States, as well as from for-profit organizations must be obtained on an individual basis and there is no ability to check for omissions.

For instance, many international businesses are currently involved in non-communicable disease projects (insurance schemes for employees, market based research, health worker training, service delivery, drug donations, etc.) both through their commercial and philanthropic operations. However, the companies that replied to our funding inquiry disclosed NCD funding primarily through philanthropic channels. Although we received several positive and helpful responses, the completion rate of the survey was very low—a problem encountered by other research groups attempting to do similar analyses (Narasimhan & Attaran, 2003). The result is that private-sector funding for NCDs is almost certainly underestimated.

2. Partial Information: Incomplete information about the nature, destination, duration, or amount of funding may be provided by known sources. One example is when ODA is reported with broad descriptors, such as health systems or general health. Not all projects include sufficiently detailed project titles and descriptions to enable classifying each line item by disease area. We estimate that 30–40 percent of all line items in the ODA health spending category could not be attributed to a particular disease area, and are therefore left out of our calculations. It is likely that some NCD funding is included in that general category; however, we do not have a reliable means of estimating the proportion of NCD funding. Similarly, Ravishankar et al. (2009) concluded that almost one third of development assistance for health cannot be attributed to a particular disease area.

3. Inconsistent reporting: Because donor funding for NCDs is a relatively new phenomenon, there are not clear and uniform protocols and definitions for reporting. To start with, the definition of NCDs is not standardized in official or unofficial use. We use an inclusive definition that coincides with WHO's typology. However, it is not unambiguous. For instance, Human Papilloma Virus (HPV) is infectious in etiology but a precursor of cancer, whereas AIDS is now defined by many as a chronic disease but is not part of our NCD analysis.

Therefore, the same stream of funding may be categorized one year as related to a specific disease, such as heart disease, and the next year as NCD funding. Another issue is that WHO budget reporting categories were redefined during the years included in this study. Thus, it can

be difficult to maintain a consistent time series. In addition, reporting inconsistencies even within a single database can make analysis quite tedious. As an example, the health commitment amounts reported through the CRS online database are inconsistent with the numbers reported in the annually released CD-ROM from OECD/DAC.

Finally, this study aims to track donor funding. Therefore, it omits national and out-of-pocket spending on NCDs, one or both of which constitute the largest source of health expenditure in most countries. In addition, because we could not access charitable funding sources outside the United States and because private donors report only some of their funding channels or do not reveal funding at all, our results likely understate actual spending on NCDs. Therefore, our results are most useful for indicating trends and general levels of donor contributions for NCDs relative to other disease categories.

6) Results

A. Total Donor Funding for NCDs

NCD donor funding increased from US\$238 million in 2004 to US\$686 million in 2008 in real terms. This constitutes a 288 percent rise over four years. Multilateral funding increased from US\$175 million to US\$306 million, almost doubling between 2004 and 2008. Private, non-profit funding for NCDs was negligible in 2004 but more than doubled between 2005 and 2008 from US\$124 million to US\$276 million. The other major contributors to NCD resources for developing countries are bilateral foreign assistance and the philanthropic arms of private companies. Bilateral donors provided \$67 million for NCDs in 2008, also more than doubling their NCD contributions since 2004. Company charitable funding remained roughly the same during the period. Funding contributions from research institutions were responsible for only 1 percent of total NCD funding between 2004 and 2008. Figure 5 shows the trend in major sources of donor funding for NCDs.

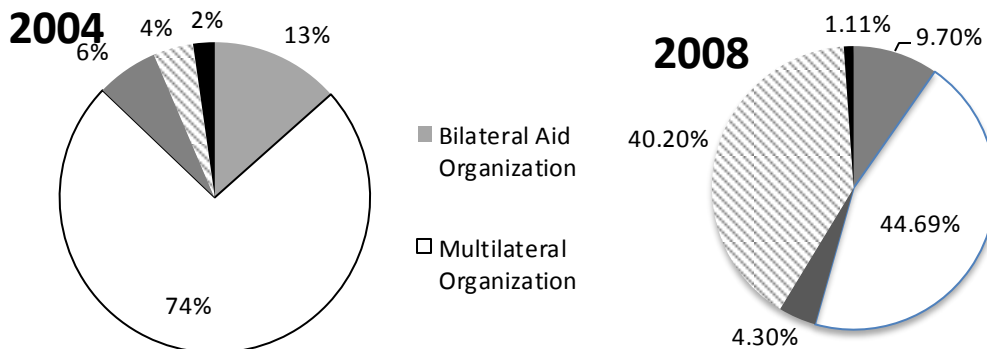
Figure 5. Donor Support for Non-Communicable Diseases by Donor Type, 2004-2008.



Trends in Donor Funding for NCDs

Figure 6 provides the proportions of funding for NCDs by type of donor in 2004 and 2008. Official government funding from multilaterals and traditional bilateral donors has risen since 2004, but the largest growth comes from the private sector. The charitable arms of for-profit and not-for profit organizations together contributed over US\$305 million in 2008, constituting a 1,200 percent increase since 2004. The total almost equaled funding from multilateral agencies, at 44 percent and 45 percent, respectively. This constitutes a major rebalancing of contributions in four years. In 2004, 10 percent of NCD funding came from private sources and 74 percent was from multilaterals.

Figure 6. Donor Spending on NCDs in Developing Countries from All Sources



These findings not only reflect a changing set of players in global health funding, but also a growing interest from the private sector in addressing NCDs. One reason for this phenomenon may be the prospect that NCDs will disproportionately affect the working population and slow efforts to raise productivity and economic prosperity. Another may be the commercial opportunities for health technology and treatment envisioned by industry. The growing importance of private sector support also reflects the continuing lack of interest from most bilateral donors in NCDs, and the limited latitude that multilateral donors have in their DAH spending due to prior commitments to vertical programs, exacerbated by the financial crisis. Nonetheless, a rising overall trend in NCD funding is expected to continue, as all donors who completed the survey and had ongoing non-communicable disease funding activities indicated that their future NCD funding will either remain the same or increase.

B. NCD Donor Funding in Comparison with DAH Categories

Ravishankar et al. (2009) recently provided estimates for all development assistance for health (DAH).¹² Our analysis measures only NCD donor funding to developing countries. To enable a comparison of donor funding for NCDs with the donor support to other major categories in health, we utilized Ravishankar et al.'s analysis of development assistance for health, making adjustments to avoid double-counting.

Ravishankar et al. report that HIV, tuberculosis, and malaria received over US\$6.3 billion from donors in 2007; close to US\$ 7 billion was provided for other diseases and conditions; almost US\$1 billion was spent on health sector support; and US\$8 billion did not fit those categories and was termed "unallocable." We have estimated that \$503 million was spent by all donors on NCDs in 2007. Wishing to compare our NCD donor funding to other health categories in Ravishankar, we subtracted the identifiable NCD funding from the "unallocable" category of Ravishankar's database and created a new category of all NCD funding—including the private-sector NCD funding identified in our search.¹³ Total DAH numbers for this exercise are therefore higher than Ravishankar et al.'s totals, which do not include some private donors.

The results are shown in Table 4 for each year of available data,¹⁴ and in Table 5 in terms of donor funding per 2008 DALY. NCD donor funding increased by 211 percent between 2004 and 2007. This growth compares favorably to the 198 percent increase in spending on HIV/AIDS, TB, and malaria, and 139 percent increase in total DAH between 2004 and 2007. As a result, NCD funding is rising as a proportion of overall DAH, up to 2.3 percent in 2007 from 1.5 percent in 2004. We estimate that NCD funding for rose substantially between 2007 and 2008 (see Figure 5), but we do not have DAH figures for 2008 from which to estimate proportions.

¹² Excluding for-profit private sector funding

¹³ Donor funding for NCDs in 2007 totaled \$ 503 million. Of that, US\$ 222 million was added to Ravishankar et al.'s total DAH for the year 2007, while US\$ 281 million were subtracted from Ravishankar et al.'s reported unallocable disease funding as likely double-counting from multilateral, bilateral, and foundation sources.

¹⁴ NCD data prior to 2004 are not comparable to later years.

Table 4: Development Assistance for Health by Category, 2001 – 2007

US\$, million	2001	2002	2003	2004	2005	2006	2007
HIV, TB, Malaria	1226	1708	2217	3146	4196	5063	6315
Health Sector Support	14	72	124	215	424	776	937
Other	5431	5495	6383	6740	7015	6270	6570
Unallocable*	4237	5165	4825	5266	6018	6618	7687
NCDs	NA	NA	NA	238	399	425	503
DAH**	10907	12440	13548	15604	18052	19152	22013
NCD funding as percent of overall DAH ***	NA	NA	NA	1.5%	2.2%	2.2%	2.3%

Source: Ravishankar et al., 2009 and authors' calculations.¹⁵ *Adjusted to exclude estimated NCD funding ** Years 2004–2007 augmented by authors' NCD totals

The relative donor funding available to NCDs and other diseases in terms of the burden of disease is shown in Table 5. Approximately \$0.78/DALY was provided by donors for non-communicable diseases in LMICs in 2007, compared to \$23.9/DALY for HIV/AIDS, TB, and malaria combined, and \$16.4/DALY for all conditions. If donors provided just half the support to avoid NCD DALYs that they provide to the three major infectious diseases, it would amount to almost \$4 billion in DAH for NCDs.

Table 5: ODA funding for health and disease areas per 2008 DALY

	2008 DALYs, LMICs (million) ***	Health Development Assistance 2007	Funding per DALY
HIV, TB, Malaria	264	US\$ 6,315 mill *	US\$23.9
NCDs	646	US\$ 503 mill**	78 cents
All conditions	1,338	US\$ 22,013 mill*	US\$16.4

*HIV, Malaria & TB and All conditions: Ravishankar et al., 2009 and authors' calculations

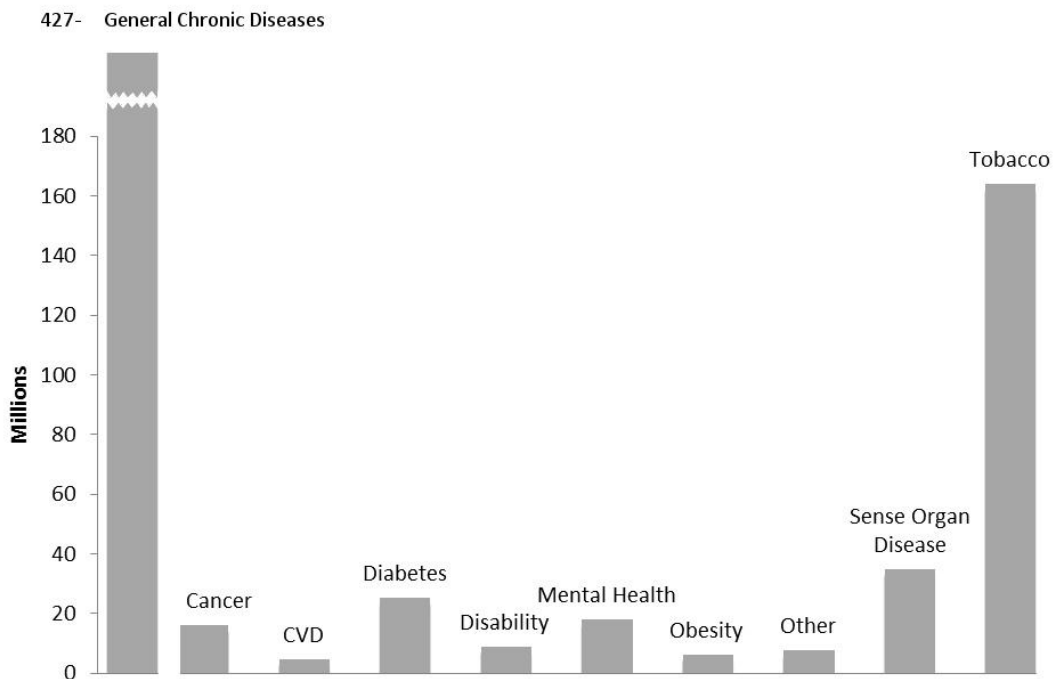
NCD Funding: CGD Funding Analysis * 2008 DALYs: WHO, 2008a

¹⁵ Note that these figures are still not completely comparable as only the NCD category includes private sector health assistance from for-profit companies. NCD funding as a percent of overall DAH would be smaller if all private funding were included in the other categories.

C. Donor Spending on NCDs by Type of Disease, 2008

Disease-specific member and advocacy organizations within the non-communicable disease category are increasingly allied in their advocacy for greater attention in global health.¹⁶ Nonetheless, definitions of NCDs and chronic disease abound and are often confused in advocacy and academic discussions. The largest segment of donor funding in our database is described as “general non-communicable disease funding,” implying that more than one specific disease is addressed. Of those funding streams with a specific disease or risk factor specified, tobacco received the most funding, followed by obesity, sense organ diseases, diabetes, and mental health. Aging, alcohol, and kidney disease received the lowest amount of funding (Figure 7).¹⁷

Figure 4: 2007 Development Assistance for Non-communicable Diseases by Type of Disease



¹⁶ For instance, joint advocacy among major international NGO groups through the [NCD Alliance](#).

¹⁷ Note that both risk factors and diseases are used as subcategories in the databases we used and descriptions of projects by donors.

D. Top 10 Funders of NCDs

The donors who contributed more than US\$20 million over the five-year period from 2004 to 2008 are listed in Table 6. The largest donors collectively contributed over \$2 billion to NCDs in LMICs over 5 years (89 percent of the total), with over 10 percent of this amount earmarked for tobacco control. Among the largest funders, more than 70 percent of funding comes from 3 donors: WHO, World Bank, and Wellcome Trust UK.¹⁸

The single greatest source of expenditures on NCDs in developing countries is the World Health Organization, which spent over US\$812 million dollars on NCDs between 2004 and 2008. The WHO stands out from most other global health donors in its very significant increase in attention to NCDs in recent years. A possible reason could be the strong push from developing member countries for guidance in an area where they have little existing expertise, and other donors are as yet virtually absent. The visible rise in private sector involvement could eventually change this picture. Nonetheless, an important conclusion is that only one major multilateral organization is addressing NCDs in a substantial way, with the notable absence of any global health organization dedicated to NCDs.

The second largest funder of NCDs in developing countries is the Wellcome Trust, UK, with a total contribution greater than US\$ 450 million over five years. The Wellcome Trust supports NCD disease research and research capacity building. The next largest funder is the World Bank, which committed close to US\$200 million in loans for NCD-related projects over five years, as well as a small allocation to NCD policy research in tobacco and NCDs generally.

Through both separate and combined grant-making, the 4th and 5th ranked NCD donors, the Bloomberg Foundation and the Bill and Melinda Gates Foundation, provided more than US\$200 million dollars over five years to tobacco control, with the Gates Foundation also contributing a substantial amount to cervical cancer. Other funders providing over \$20 million each across the time period are listed in Table 6. We are certain that our analysis omits some amount of NCD funding from both the private and public sectors, but it is unlikely that major donors have been missed.

¹⁸ Although research funding is not typically considered to be ODA, we include funds allocated to developing country research for NCDs because they typically incorporate capacity-building to improve health care in developing countries, and possibly transfer knowledge back to developed countries. A \$26 million annual research program to establish Centers of Excellence in Chronic Diseases in Developing Countries was funded by NIH/NHLBI beginning in 2009 and \$10.5 million for research training from the NIH/Fogarty was funded beginning in 2008. The former program is not represented in the tables above which end in 2008.

Table 6: NCD donors over US\$20 million between 2004 and 2008

NAME OF FUNDER	2007 million US\$
WHO	\$812 m
General NCDs (\$812 m)	
Wellcome Trust UK	\$458 m
General NCDs (\$315 m)	
Obesity (\$61 m)	
CVD (\$25 m)	
Sense Organ (\$15 m)	
Cancer (\$14 m)	
Physical Inactivity (\$10 m)	
High BP/ Hypertension (\$8 m)	
Respiratory Diseases (\$5 m)	
Alcohol (\$4 m)	
Tobacco (\$1 m)	
World Bank	\$183 m
General NCDs (\$182 m)	
Sense Organ (\$1 m)	
Bloomberg Foundation	\$123 m
Tobacco (\$123 m)	
Bloomberg/ Gates	\$90 m
Tobacco (\$90 m)	

Novo Nordisk	\$68 m
Diabetes (\$61 m)	
General NCDs (\$7 m)	
PAHO	\$61 m
General NCDs (\$ 61 m)	
Spain	\$44 m
Aging (\$1 m)	
Cancer (\$4m)	
CVD (\$20m)	
Diabetes (\$1m)	
General NCDs (\$0.4m)	
Mental Health (\$8m)	
Sense Organ (\$7m)	
Other (\$2m)	
GE Foundation	\$41 m
General NCDs (\$41 m)	
Gates Foundation	\$38 m
Cervical Cancer (\$24 m)	
Sense Organ (\$13 m)	
General NCDs (\$1 m)	
NIH	\$27 m
Aging (\$1m)	
Cancer (\$4m)	
CVD (\$1m)	
Tobacco (\$21m)	
Netherlands	\$21 m
Aging (\$1m)	
Cancer (\$14m)	
Mental Health (\$4m)	
Other (\$1m)	
Sense Organ (\$1m)	
Germany	\$21 m
Mental Health (\$11m)	
Other (\$6m)	
Sense Organ (\$4m)	
IDB	\$21 m
General NCDs (\$21 m)	
5-Year Grand Total	\$2,008 m

8) Conclusion: The Road Ahead

From biological, behavioral, and health-systems angles, there is a growing understanding of the complexity and interconnectedness of disease risks and patterns. In the past, disease specific approaches and initiatives (and thereby, disease specific funding) have failed to acknowledge that, as low- and middle-income countries undergo economic growth and demographic transitions, there will be a growing double burden of diseases and concomitant co-morbidities. While disease specific appeals might have more easily garnered financial support than calls for system wide assistance, the evidence of co-morbidities and the need for system wide interventions can no longer be ignored. Examples abound. Tobacco taxation will increase revenues thereby making available additional resources to treat medical conditions while preventing lung cancer morbidity and mortality (Tandon and Cashin, 2010); increased GDP growth due to healthier working class populations can lead to fewer catastrophic health costs both to individuals and to the system; community-based physical activity programs reduce non-communicable disease risk and simultaneously build social networks.

Fortunately, prevention and management of NCDs, spanning the individual, community, and policy level can in many ways be complementary to infectious disease programs. For instance, there is evidence that tuberculosis (TB) exacerbates the risk for developing diabetes mellitus (DM), and vice versa. Some aspects of the immune response to TB could lead to insulin resistance or decreased insulin production, both resulting in increased blood glucose (Young et al., 2009). In India, where both TB and DM burdens are high, the integration of care delivery would be not only sensible, but possibly the only way to curb either epidemic. Similarly, in Cambodia, where the integration of HIV/AIDS and diabetes care has been successful, both efficiency and health outcomes were improved merely by providing comprehensive care and tailoring the intervention to the existence of co-morbidities (Young et al., 2009).

These integrated approaches present new challenges, but also opportunities for health system reform that may hold the promise of bringing versatility, cost-efficiencies, and improved health outcomes to developing countries. Alternatively, continuing to allocate the bulk of donor resources to a shrinking share of population needs will expedite the ineffectiveness and marginalization of public health systems.

The establishment of a better funding data tracking system, together with the evaluation of programs and interventions, will support effective, multisectoral health programming in developing countries. In the case of non-communicable diseases in particular, due to the growing health burden and potential escalating economic costs and productivity losses, a transparent, accurate, and complete funding information system is urgently needed to support a balanced response in low- and middle-income countries.

Ongoing change in global health architecture and needs makes it increasingly difficult to track and report on both programming and *de facto* funding levels. Transnational private corporations are not subject to transparent financial reporting as the WHO and World Bank are, many small scale NGO-run projects are being missed by tracking efforts, and the fragmentation and lack of transparency of funding vehicles within official donors make tracking of interventions and associated funding levels an arduous task.

Several steps would offer significant improvements over current conditions. From most immediate to longer-term, we recommend the following:

- Expand the current OECD/DAC reporting system to include an NCD category in DAH. Indeed, tracking of NCD resources should be put in place as soon as possible while the donor field is still relatively small.
- Have private NGOs and businesses report systematically on their donor and support activities.
- Raise the priority accorded to information about NCDs within global health institutions.
- Finally, developing countries should begin to incorporate NCDs into their health information systems.¹⁹

Attention to NCDs from low- and middle-income countries is beginning to drive a stronger global response. Strategies to tackle NCDs are being developed; for example, the Caribbean Community (CARICOM) issued the Port-of-Spain Declaration in 2007 and is in the final stages of developing a three-year strategic plan, “Non-Communicable Disease Prevention and Control: 2009–2013.”²⁰ Individual countries in every region of the world have taken action to respond to NCD health needs, including Russia, Ghana, Brazil, South Africa, Nigeria, and Bangladesh. The Commonwealth Heads of Government (representing 54 member states and one-third of the world’s population) issued a statement in late 2009 affirming their commitment to countering NCDs, and calling for indicators and targets to be included within the MDGs. Urged by those developing-country groups, the UN General Assembly in 2010 voted to hold a high-level meeting on NCDs in September 2011. The September 2010 UN review of the MDGs alerted member countries to the growing impacts of NCDs on the development agenda.²¹

As preparations for the 2011 NCD High-Level meeting progress, one of the priority actions should be to improve information about funding and spending on NCDs, both at the global and national levels. This will help ensure that the inevitable shift in global health attention toward NCDs is accompanied by knowledge about where to direct that attention.

¹⁹ Efforts are underway to produce national health account reports that detail disease specific spending. However, this WHO project is in its pilot stage, and only information on some infectious diseases is thus far available (<http://www.who.int/nha/developments/en/>).

²⁰ CARICOM Press Release http://www.caricom.org/jsp/pressreleases/pres439_09.jsp.

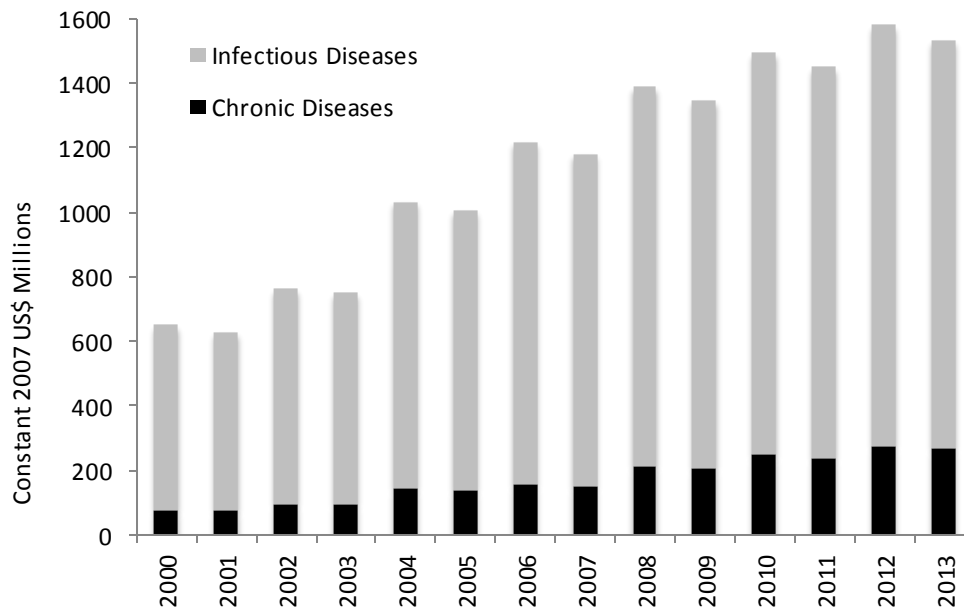
²¹ http://www.un.org/en/mdg/summit2010/pdf/mdg_percent20outcome_percent20document.pdf, accessed September 27, 2010.

Appendix 1: NCD Donor Funding by Type of Donor

A. WHO and PAHO

WHO funding for non-communicable diseases was \$427 million in the combined 2008/09 budget biennium. The WHO's annual support for non-communicable diseases is projected to rise from \$79 million in 2000 to \$270 million in 2013, a slight increase in relative terms from less than 10 percent to over 11 percent of overall allocations. Infectious diseases received 58 percent of the WHO funding in the 2008–09 budget cycle.²² Figure 7 shows the comparison of annual spending on infectious and non-communicable diseases in the WHO budget.

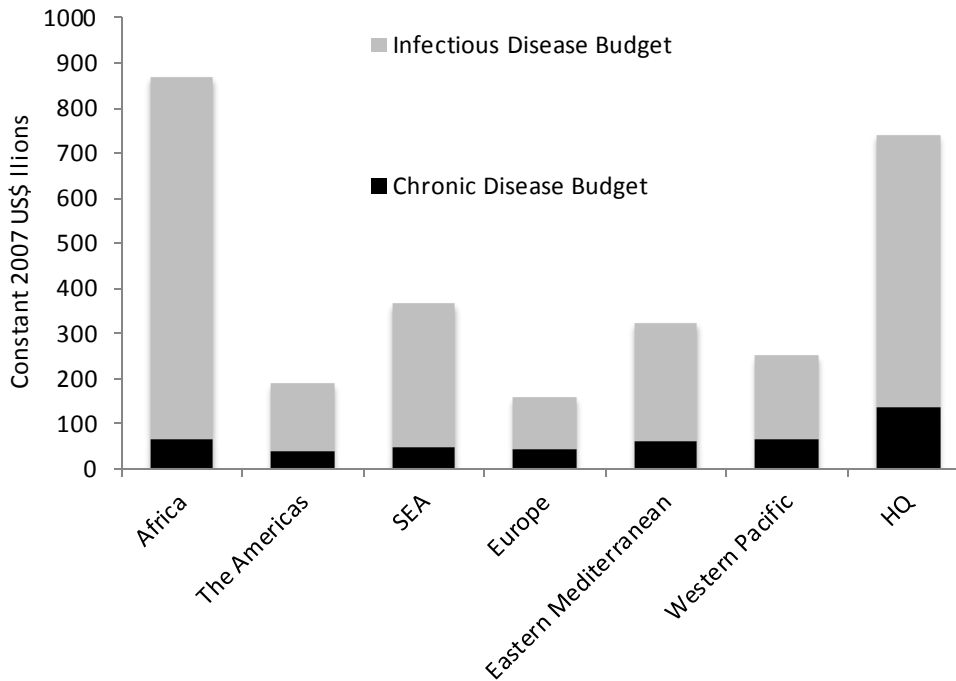
Figure 5: World Health Organization budget, 2000–2013 projected (WHO)



This predominance of infectious disease funding is consistent across all WHO regions, as shown in Figure 8. NCD funding ranges from 5 percent to 19 percent of spending in regional WHO offices for the biennium 2008/09.

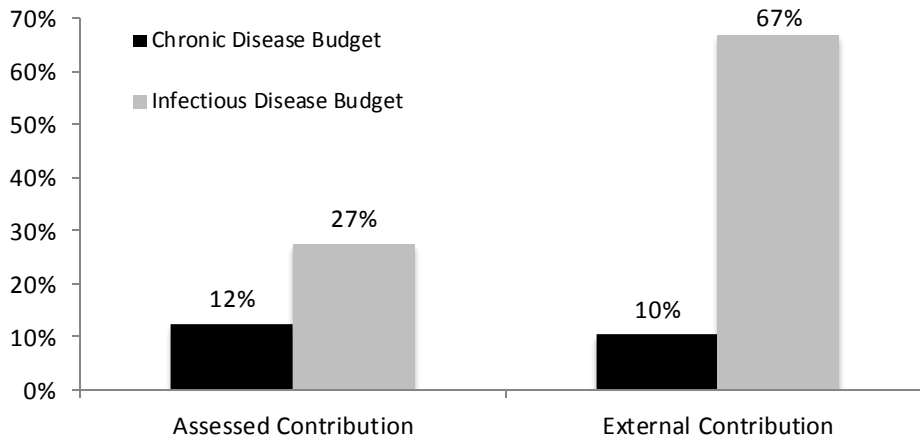
²² Note that the infectious disease category includes reproductive and maternal and child health.

Figure 6: WHO budget by disease type and WHO region, 2008/09



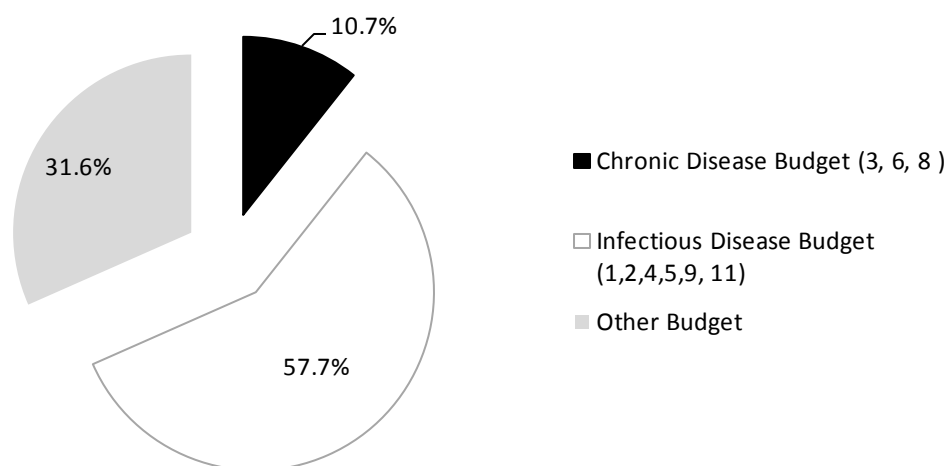
Assessed contributions from member states comprise a little less than 25 percent of WHO’s overall budget and show a relatively greater emphasis on non-communicable disease funding than supplementary contributions (Figure 7). Only 10 percent of WHO external contributions are allocated to non-communicable diseases, while 12 percent of assessed contributions are allocated to NCDs.

Figure 7: WHO Budget by type of contribution, 2008/09 biennial budget



The remainder of the WHO budget (31 percent) was allocated to health and human rights issues (WHO objective 7) as well as administrative, legal, and governance issues (WHO objectives 10, 12, and 13). The overall budget composition, combining both assessed and external contributions, are depicted in Figure 10 for the biennium 2008/09.

Figure 10: Total programmed WHO budget, 2008/09 biennium



In addition to funding, the World Health Organization has an important normative role in establishing guidelines and standards for member countries through its non-communicable disease projects and programs. It has also vastly improved the available data and information about NCDs in developing countries through its health reporting databases, and has taken on a visible advocacy role in preparation for the 2011 UN Summit on NCDs (World Health Organization, 2009b). Finally, WHO/PAHO has moved in recent years to work more closely with private donors to shape the global health policy dialogue on NCDs. The recent launches of NCD-Net through WHO and the Partners Forum for Action Against Chronic Diseases in the Americas through PAHO indicate that public-private partnerships will play a growing role in the donor landscape of non-communicable diseases.

B. World Bank and Regional Development Banks

World Bank funding for non-communicable diseases rose from US\$27million in 2004 to about US\$47 million in the years 2008. These amounts represent non-communicable disease funding as specifically indicated in the World Bank’s project database, including one regional project in Bangladesh. In 2007, the World Bank released the results of a major analysis of NCDs in developing countries, and in 2008, it published a working paper on tobacco control that

garnered global attention. However important these policy contributions are, there has been little other investment in NCDs from the World Bank.

The Inter-American Development Bank recently developed a programmatic focus on non-communicable disease programs, with two comprehensive health and non-communicable disease programs launched in 2008 and 2009, respectively. The programmed funds for these two projects amount to US\$ 170 million total between 2007 and 2012.

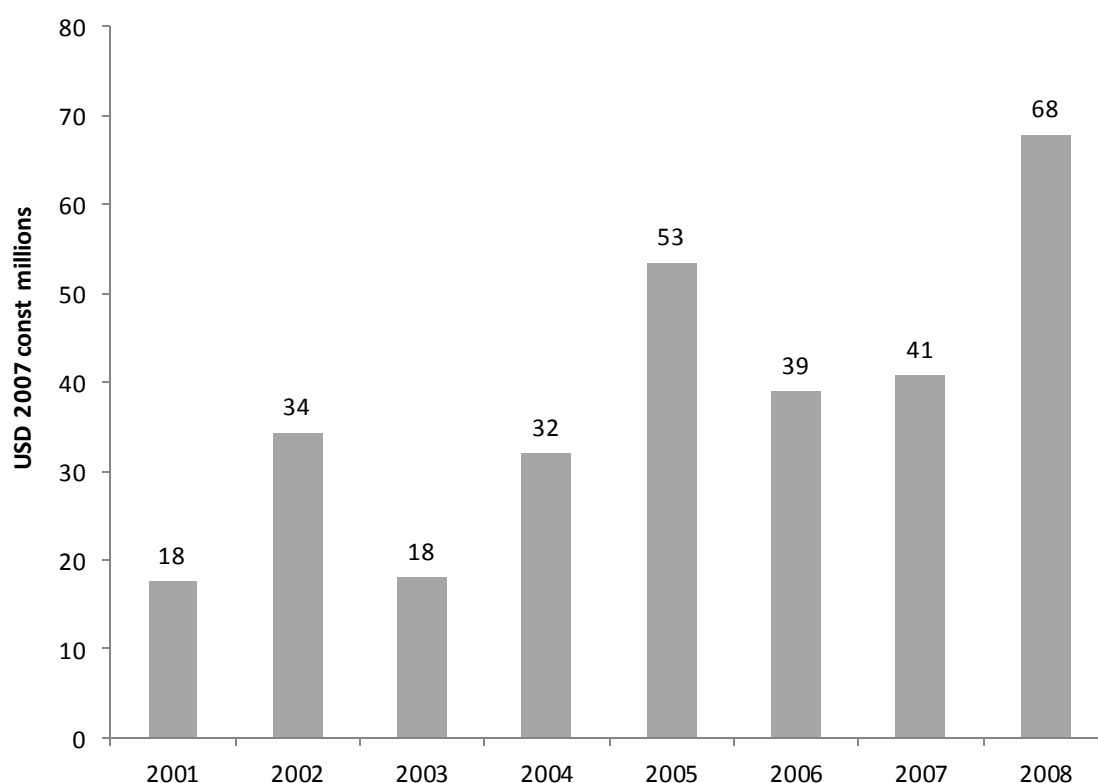
No specific NCD resources were identified in the project database of the African Development Bank, and we did not receive any response to our survey from the European, Asian, or Islamic Development Bank.

C. Official Development Assistance (OECD/CRS)

The Organization for Economic Cooperation and Development's Development Assistance Committee (OECD/DAC) operates the Creditor Reporting System (CRS), which relies on information reported periodically by DAC members according to a common format and definitions, and which provides textual and numerical information on individual development assistance transactions. The primary data for the CRS database are from official agency reporting to OECD (reviewed in CGD's Resource Tracking Working Group, 2007).

CRS-reported bilateral donor spending on non-communicable diseases rose from US\$15million in 2001 to US\$68 million in 2008 (less than 0.7 percent of CRS reported health ODA) (Figure 11). Since non-communicable disease projects do not yet have their own category in the OECD/CRS database, the amounts we report as "NCD aid" are assigned to various disease categories in the database, such as "reproductive health" (as in the case of cervical cancer projects) or "general health budget support." However, we excluded all funds for which the description did not explicitly mention NCDs. Therefore, we likely underestimate the actual NCD amounts from official donors. Roughly, 30–40 percent of all line items descriptions were too general to allow us to classify them into infectious or non-communicable disease areas. Also, some nutrition, general health system support, and infrastructure programs would be expected to contribute to non-communicable disease program delivery but are not included in our reported figures.

Figure 11: CRS reported funding for NCDs, 2001–08 (OECD/DAC, 2010)



D. CGD Survey of Private Sector Funding for NCDs

A donor and recipient on-line survey was posted by CGD from March 2009 throughout July 2009. One-hundred eleven recipient organizations and 168 donor organizations were contacted via personal emails. Of the 168 donor organizations contacted, only 30 organizations responded and even fewer completed the survey. Especially unforthcoming were private businesses that confirmed their contributions to developing country NCD needs, yet were unable to provide us with detailed funding information as company policies prohibited them from doing so. These problems echo those of other researchers aiming to elicit information directly from private health aid donors and recipients (i.e., G-Finder Survey and Malaria Survey [Moran et al., 2009]).

All donors who responded stated that their level of NCD funding would remain the same or increase after 2009. Of the 111 recipient organizations contacted, 25 responded, but only four surveys were completed. We received the highest response from research institutions (14 out of 25 responses), followed by not-for-profit organizations (7) and government (3) and multilateral organizations (1). The information gathered from development aid recipients is not reported due to the low response.

In summary, although the quantitative value of the data reported through the survey by donors was incomplete, we were able to obtain detailed responses from those we believe to be the most significant non-communicable disease private funders. We also received valuable information about how donors conduct health projects, including information about in-kind contributions.

Table 7: Types of Recipient Organizations that responded to CGD’s web survey

Governmental	Multilateral	Not-for-Profit Foundation	Research Institution
3	1	7	14

Appendix II: Recent Literature on Global Health Donor Funding, 2004–10

Non-communicable Disease Specific Funding Analyses

- 1. Yach, D. & Hawkes, C. (2004): Towards a WHO long-term strategy for prevention and control of leading non-communicable diseases.** Bilateral, Multilateral, and WHO non-communicable disease spending analysis: 0.01 percent of total bilateral ODA allocated to CDs in 2002. WHO spent 3.5 percent of budget on NCDs in 2002.
- 2. Sridhar, D. & Batniji, R. (2008): Misfinancing global health: a case for transparency in disbursements and decision making.** Analysis of WB, Gates foundation, US Govt, and Global Fund Global Health Financing: non-communicable diseases by far the least amount of funding with US\$3 per annual death vs. US\$1030/death for HIV programs
- 3. Stuckler, D. et al., (2008): WHO's budgetary allocations and burden of disease: a comparative analysis** In 06/07, WHO allocated 87 percent of its total budget to infectious diseases, 12 percent to non-communicable diseases, and less than 1 percent to injuries and violence

Other Disease Funding Analyses

- 1. Ravishankar, N. et al., (2009): Financing of global health: tracking development assistance for health from 1990 to 2007** DAH grew from US\$5.6 billion in 1990 to US\$21.8 billion in 2007. Of the US\$14.5 billion DAH in 2007 for which project-level information was available, \$5.1 billion was for HIV/AIDS, compared with US\$0.7 billion for tuberculosis, US\$0.8 billion for malaria, and US\$0.9 billion for health-sector support.
- 2. Kates et al., (2010): Donor Funding for Health in Low and Middle-Income Countries, 2001-2008** Funding for health tripled over the period, rising from US\$7.2 billion to US\$26.4 billion, an increase in real terms even after adjusting for inflation and currency revaluation. Funding for health grew at a much faster pace (208 percent) than overall ODA between 2001 and 2008 and, other than government/civil society programming, which grew by 260 percent, was the fastest growing sector over the period. As a percentage of total ODA, health increased from 13 percent in 2001 to 18 percent in 2008. In 2008, it received the second largest share of ODA commitments, after multisector/cross cutting project funding.

- 3. Greco, G. et al. (2008): Countdown to 2015: assessment of donor assistance to maternal, newborn, and child health between 2003 and 2006.** CRS database analysis of ODA dedicated to maternal and child health from 2003 – 06. In the 68 priority countries, child-related disbursements increased from a mean of US\$4 per child in 2003 to US\$7 per child in 2006; disbursements for maternal and neonatal health increased from US\$7 per livebirth in 2003 to US\$12 per livebirth in 2006.
- 4. Powell-Jackson T. et al. (2006): Countdown to 2015: tracking donor assistance to maternal, newborn, and child health.** ODA was tracked on a project-by-project basis to 150 developing countries to determine spending on maternal and child health in 2003 and 2004. The 60 priority low-income countries that account for most child and newborn deaths received US\$1363 million, or US\$3.1 per child.
- 5. Moran M, Guzman J, et al. (2009): Neglected disease research and development: how much are we really spending?** G-Finder Survey of pharmaceutical companies to determine funding on R&D for neglected diseases. Just over US\$2.5 billion was invested in R&D of new neglected disease products in 2007. Funding was highly concentrated, with HIV/AIDS, TB, and malaria receiving nearly 80 percent of the total. Other equally high-burden diseases as measured by DALYs (disability-adjusted life years), such as pneumonia and the diarrheal illnesses, collectively received less than 6 percent of total funding.
- 6. Families Health USA (2008): The World Can't wait.** Online survey of CDC, DOD, USAID, and NIH funding. Total funding across all study areas was US\$366 million, research funding exceeded US\$100 million for only two out of 8 neglected diseases. All of the agencies were involved in research on multiple diseases, particularly diseases with the greatest level of funding. However, for half of the diseases in this study, NIH was the only agency engaging in research on that disease.
- 7. Shiffman J. (2006). Donor funding priorities for communicable disease control in the developing world.** OECD/ DAC analysis: Data show that funding does not correspond closely with burden. Acute respiratory infections comprise more than a quarter of the burden among these diseases but receive less than 3 percent of direct aid.
- 8. McCoy D. et al. (2009). Global health funding: how much, where it comes from, and where it goes** McCoy et al. offer a detailed description of the volume of global health expenditure; the source of this funding; its management; and how it is spent. They suggest that a detailed description of global health funding is needed to improve the efficiency, accountability, performance and equity-impact of the many actors that populate the global health landscape.

Appendix III: Detailed Description of CGD NCD Donor Funding Tracking Methodology

Donors were classified into the following categories:

- Bilateral Aid Organization
- Multilateral Organization
- Disease Membership Association
- Private For Profit Organization
- Private Non-Profit Organization
- Public Health Organization
- Research Institution

Information was gathered on commitment year, donor name, donor agency, recipient name, commitment date, flow name, purpose name, short description, long description, project title, channel of delivery, grant element, US\$ commitments, US\$ disbursements, US\$ amount in US\$2007, US\$ amount tied, US\$ amount untied, type of disease, grant/loan, type of organization, source of funding information, recipient country, and funding category.

A. Literature and Funding Database Search

PubMed, Google Scholar, and Web of Science were searched for publications on NCD funding analyses as well as detailed funding analyses for other disease specific funding. The bibliography of relevant publications was searched for other applicable articles, which were hand-picked and included in our results. When necessary, we contacted the lead authors to clarify methodological questions and to elicit additional information.

We included the following funding databases in our database search:

- AiDA (Accessible Information on Development Activities)
- Resource Flows Database
- OECD Health Data (CRS database)
- WHO National Health Accounts Health Accounts/ National Health Accounts
- PHR National Health Accounts
- World Development Indicators
- NHExp Database
- Database of Trade in Health Related Goods and Services Database
- Idasa Budget Information Service Budget Briefs

These databases had been identified as the major donor funding databases in a comprehensive review and description by the Center for Global Development (CGD, 2007). All of

them were searched for the terms: 'Chronic', 'Non-communicable', 'Cancer', 'Sense Organ', 'Mental Health', 'Cardiovascular', 'Heart Disease', 'Diabet**', 'Obesity', 'Ophthal**', 'Psych**', and 'Tobacco'.

Of the above databases only the CRS database relayed information on NCD spending; therefore we focused our efforts on it. We were able to get a CD-ROM of ODA specifically intended for research purposes. Every year, OECD/DAC releases an updated CD-ROM containing the dataset for Official Development Assistance since 1990. Each year includes 30,000 to over 700,000 grant records (the years 2001 to 2008 contain between 40,000 and 70,000 grant records for each year). Since a preliminary keyword search on the entire database revealed some NCD specific line items that were not pre-classified as health items, we performed an extensive keyword search for NCD line items on each year from 2001 to 2008. We then excluded all non-health line items that had not been classified as NCD specific line items. We subsequently reviewed the project title, the short and long project description, and the purpose of each line item to identify grant or loan amounts for non-communicable disease funding. All line items that matched our NCD definition and inclusion criteria were included in our results. We also contacted the bilateral organizations identified as NCD donors via this database search, both to confirm the acquired information as well as to investigate any potential additional NCD funding activities.

B. Web survey (donor / recipient focus)

Our first step in the donor and recipient survey was to identify major stakeholders and funders focusing on NCDs by contacting funders that were known to us (most funding databases report information on major infectious diseases such as HIV/AIDS, TB, and malaria, family and child health, and other MDG-related health indicators; since NCDs are an underrepresented area in global health, no distinct category exists for them). We sent an email to funders and major players related to NCD activities in developing countries encouraging them to name other potential NCD funders as well as provide us with their contact information. The websites of major global health donors such as the Wellcome Trust, the Gates Foundation, and the Open Society Foundation were also searched for NCD funding information.

Based on similar surveys (as done by the Malaria funding analysis and the G-Finder report (Moran et al., 2009)), we drafted a web-survey that was pilot-tested with several colleagues. The donor survey was sent to over 160 organizations, and the recipient survey was sent to 200 recipients of chronic disease funding known to us. Several reminders were sent out, and most major donors who had not returned our survey were contacted by phone to determine their NCD funding information.

C. Phone conversations with key stakeholders

In the period from February 2009 to July 2009, key informant interviews were held by phone and in person to elicit information on public and private NCD donors, funding levels, and other in kind contributions.

Table 8: Table showing key stakeholders to discuss NCD funding for developing countries

Name	Affiliation
Derek Yach	PepsiCO
Mary Ann Ring, (& London contact)	General Electric
Christine Hancock	Oxford Health Alliance
Trevor Gunn	MedTronic
Linda Kupfer	NIH

D. WHO and PAHO budget analysis

WHO and PAHO report their funding commitments in its biennial program budgets which are published on www.who.int/gb. Since the way in which the WHO reports its planned budget has changed three times since 2002, our analysis of the budget lines was coordinated with researchers who had recently conducted WHO chronic disease budget analyses (David Stuckler, Oxford University).

Our analysis differs slightly from Stuckler et al.'s 2008 analysis in that we did not include the administrative budget based on its relative share of the chronic disease vs. infectious disease budget. However, we are consistent with Stuckler's methodology in the initial classification of NCD versus infectious disease funding. Since we were unable to find out about the methodology used in Michaud's analysis of the WHO budget, we were not able to reconcile our analysis with her methodology (Yach & Hawkes, 2004).

NCD funding by the Pan American Health Organization (PAHO) was determined by analyzing the program budget available through PAHO's website, applying the same classification scheme as for WHO's budget.

E. World Bank and other development bank budget analysis

All project information on World Bank Projects is available on the World Bank's website www.worldbank.org/projects, and there exists a specific subject category for "Injuries and Noncommunicable Diseases." Projects under this category are geared to reduce injuries by focusing on the building of infrastructure and rehabilitation, and NCD prevention and treatment are often only a sub-component of these projects. Based on the documentation that was available online, we identified very few projects with NCD subcomponents, and the WB NCD funding numbers reported in this paper are likely an underrepresentation of the total funds expended on NCDs. Our estimates of World Bank funding for NCDs are hence conservative, and for the above mentioned reasons also smaller than the numbers mentioned in (Sridhar & Batniji, 2008). We also divided the total commitment of a project by the number of years it was planned for. Ravishankar et al., report the total amount of a project in the respective commitment year, and they also obtained the disbursement schedules from a contact at the World Bank

(Ravishankar et al., 2009). While we were in contact with World Bank personnel about WB NCD activities not mentioned on the online database, we did not request the disbursement schedules. Since there were so few projects with only small NCD components, we did not feel that obtaining disbursement schedules would change our conclusions. We contacted the appropriate project officers at the World Bank to verify the cited funding numbers.

However, Ravishankar et al., dealing with a larger set of WB projects relevant to their Development Assistance for Health (DAH) analysis, showed that different sources of WB funding data reported significantly different commitment and disbursement amounts. For an excellent discussion of available funding databases and the difficulties in obtaining actual amounts in global health financing, please refer to Ravishankar et al.'s web appendix (Ravishankar et al., 2009).

We received information from the African Development Bank that it had no NCD programs.

In 2007, IDB started funding a NCD project, and there are now two IDB NCD projects underway. IDB projects increased funding levels for chronic disease and number of projects funded.

We contacted the Asian, European, and Muslim Development Banks, but did not receive responses to the query about NCD funding amounts.

F. Foundation Center Search

The Foundation Center (www.foundationcenter.org) is a U.S.-based organization that collects the information on all grants that are made by U.S.-based institutions. We commissioned a search for all chronic disease grants in their international health-funding database. The exact search protocol is included in Appendix III.

Appendix IV: Foundation Center Protocol

Search 1

Using data on international health grants of US\$100,000 or more from the Foundation Center's grants sample database for circa 2004, provide a list of grants. List fields for foundation name, foundation state, recipient name, recipient city, recipient state/country, recipient unit (e.g., the medical school of a university), country of benefit (for international grants to domestic U.S. recipients), type of recipient, recipient population group, grant amount, grant duration, year authorized, text description, grant purpose, grant population group, type of support, matching support, challenge support—ranked by foundation name and within foundation name by amount.

Sampling Base: The search set is based on the Foundation Center's grants sample database (circa 2004), which includes grants of US\$10,000 or more awarded to organizations by a sample of 1,172 larger foundations. For community foundations, only discretionary grants are included. Grants to individuals are not included in the file.

Search 2

Using data from the Foundation Center's grants sample database for circa 2005, repeat search 1.

Sampling Base: The search set is based on the Foundation Center's grants sample database (circa 2005), which includes grants of US\$10,000 or more awarded to organizations by a sample of 1,154 larger foundations. For community foundations, only discretionary grants are included. Grants to individuals are not included in the file.

Search 3

Using data from the Foundation Center's grants sample database for circa 2006, repeat search 1.

Sampling Base: The search set is based on the Foundation Center's grants sample database (circa 2006), which includes grants of US\$10,000 or more awarded to organizations by a sample of 1,263 larger foundations. For community foundations, only discretionary grants are included. Grants to individuals are not included in the file.

Search 4

Using data from the Foundation Center's grants sample database for circa 2007, repeat search 1.

Sampling Base: The search set is based on the Foundation Center's grants sample database (circa 2007), which includes grants of US\$10,000 or more awarded to organizations by a sample

of 1,339 larger foundations. For community foundations, only discretionary grants are included. Grants to individuals are not included in the file.

Protocol

Include those grants allocated to any health category with one or more of the following key words (exclude grants with a primary subject code of: E33, E40, E43, E44, E45, E46, E47, E50, E52, C25, C26, E71, E72 H81, H87, H88 G81, G87, or G88):

Cancer, Oncol*, Mamm*, cerv*, chronic, non-communicable, diabetes, diabet*, insulin, Cardiovascular disease, CVD, heart, mental, blind, eye, ophthal*, neoplasms, Lymphomas, multiple myeloma, Leukaemia, Nutritional disorders, endocrine disorders, Neuropsychiatric disorders, Unipolar depressive disorders, Bipolar affective disorder, Schizophrenia, Epilepsy, Alcohol use disorders, Alzheimer, dementias, Parkinson disease, Multiple sclerosis, Drug use disorders, Post-traumatic stress disorder, Obsessive-compulsive disorder, Panic disorder, Insomnia, Migraine, Sense organ disorders, Glaucoma, Cataracts, Refractive errors, Hearing loss, adult onset, Macular degeneration, Rheumatic heart disease, Hypertensive heart disease, Ischaemic heart disease, Cerebrovascular disease, Inflammatory heart disease, Respiratory diseases, Chronic obstructive pulmonary disease, Asthma, Digestive diseases, Peptic ulcer disease, Cirrhosis of the liver, Appendicitis, Diseases of the genitourinary system, Nephritis, nephrosis, Benign prostatic hypertrophy, Skin diseases, Musculoskeletal diseases, Rheumatoid arthritis, Osteoarthritis, Congenital abnormalities, Oral diseases, Dental caries, Periodontal disease, Edentulism.

Also include those grants with no grant description allocated to any health category except grants with a primary subject code of: E33, E40, E43, E44, E45, E46, E47, E50, E52, C25, C26, E71, E72 H81, H87, H88 G81, G87, or G88.

References

- Abegunde, D. O., Mathers, C. D., Adam, T., Ortegon, M., & Strong, K. (2007). The burden and costs of non-communicable diseases in low-income and middle-income countries. *Lancet*, 370(9603), 1929-1938.
- Action for Global Health. (2008). *Healthy aid: Why Europe must deliver more aid, better spent to save the millennium development goals*.
- Allender, S., Foster, C., Hutchinson, L., & Arambepola, C. (2008). Quantification of urbanization in relation to non-communicable diseases in developing countries: A systematic review. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 85(6), 938-951.
- Beaglehole, R., S Ebrahim, S Reddy, J Voute, S Leeder. 2007. Prevention of chronic diseases: A call to action. *The Lancet*. 5 December.
- Behrman, J.R.; Behrman, J.A.; Perez, N.M. (2009). On what diseases and health conditions should new economic research on health and development focus? *Health Econ. Apr*;18 Suppl 1:S109-28.
- Bhutta, Z. A., Ali, S., Cousens, S., Ali, T. M., Haider, B. A., Rizvi, A., et al., (2008). Alma-Ata: Rebirth and revision 6 interventions to address maternal, newborn, and child survival: What difference can integrated primary health care strategies make? *Lancet*, 372(9642), 972-989.
- CGD. (2007). *Following the money: Toward better tracking of global health resources*. Washington, DC
- Countdown Coverage Writing Group, Countdown to 2015 Core Group, Bryce, J., Daelmans, B., Dwivedi, A., Fauveau, V., et al., Countdown to 2015 for maternal, newborn, and child survival: The 2008 report on tracking coverage of interventions. *The Lancet*, 371(9620), 1247-1258.
- Families USA. The world can't wait: more funding needed for research on neglected infectious diseases. December 2008.
- Farag, M.; Nandakumar, A.K.; Wallack, S.S.; Gaumer, G.; Hodgkin, D. (2009). Does Funding From Donors Displace Government Spending For Health In Developing Countries? *Health Affairs*. 28: 1045-1055
- Fidler, D. P. (2007). Architecture amidst anarchy: Global health's quest for governance. *Global Health Governance*, 1(1)
- Gaziano, T., G. Galea, KS Reddy. 2007. Scaling up interventions for chronic disease prevention: the evidence. *The Lancet*. December 8, 2007.

- Global Alliance for Chronic Diseases. (2009). http://www.ga-cd.org/pdf/Alliance_percent20news1.pdf Last accessed: Feb. 6th 2010.
- Goudge, J., Gilson, L., Russell, S., Gumede, T., Mills, A. (2009). Affordability, availability and acceptability barriers to health care for the chronically ill: Longitudinal case studies from South Africa. *BMC Health Services Research*, 75(9).
- Huicho, L., M. Trelles, F. Gonzales, W. Mendoza, J. Miranda. 2009. Mortality profiles in a country facing epidemiological transition: an analysis of registered data. *BMC Public Health*. 9:47. Accessed at www.biomedcentral.com/1471-2458/9/47.
- Husseini, A.; Niveen, M. E.; Abu-Rmeileh; Mikki, N.; Ramahi, T. M.; Ghosh, H. A., Barghuthi, N.; Khalili, M.; Bjertness, E.; Holmboe-Ottesen, G.; Jervell, J. (2009). Cardiovascular diseases, diabetes mellitus, and cancer in the occupied Palestinian territory. *The Lancet* 2009; 373: 1041–49.
- Institute of Medicine. (2010) Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health, Washington, DC.
- Powell-Jackson T, Borghi J, Mills A. Countdown to 2015: assessment of donor assistance to maternal, newborn, and child health between 2003 and 2006. *The Lancet*; 371(9620): 1268-1275.
- Kates, J., Lief, E., & Pearson, J. (2009). *Donor funding for health in low and middle-income countries, 2001 – 2007*
- Kates, J., Wexler, A., Lief, E., & Seegobin, V. (2010). *Donor funding for health in low and middle-income countries, 2001 – 2008*
- Karrar, Z.A., A. Nurul, P.K. Streatfield. (2009). Epidemiological transition in rural Bangladesh, 1986-2006. *Global Health Action*.
- Lawn, J. E., Rohde, J., Rifkin, S., Were, M., Paul, V. K., & Chopra, M. (2008). Alma-Ata 30 years on: Revolutionary, relevant, and time to revitalize. *Lancet*, 372(9642), 917-927.
- Leeder, S., S. Raymond, H. Greenberg. 2006. *A Race Against Time*. Earth Institute, Columbia University, New York.
- Le Clair, C., Abbi, T., Sandhu, H. Tappia, P.S. (2009). Impact of maternal undernutrition on diabetes and cardiovascular disease risk in adult offspring. *Can J Physiol Pharmacol*. 87(3):161-79.
- Lim, S., T. Gaziano, E. Gakidou, KS Reddy, F Farzadfar, R. Lozano, A. Rodgers. 2007. Prevention of chronic disease in high-risk individuals and low-income and middle-income countries: health effects and costs. *The Lancet*. December 15, 2007.

- Lopez, A.D.; Mathers, C.D.; Ezzati, M.; Murray, C.J.L.; Jamison, D.T. (2006). *Global burden of disease and risk factors*. New York, Oxford University Press.
- Magnusson, R. S. (2009). Rethinking global health challenges: Towards a 'global compact' for reducing the burden of non-communicable disease. *Public Health*, 123(3), 265-274.
- McCoy, D., Chand, S., & Sridhar, D. (2009). Global health funding: How much, where it comes from and where it goes. *Health Policy and Planning*; July 1 online special.
- Mathers, C.D.; Loncar, D. (2005). Updated projections of global mortality and burden of disease, 2002-2030: data sources, methods and results. *Evidence and Information for Policy Working Paper*. World Health Organization.
- Mathers, C.D.; Loncar, D. (2006). *Projections of global mortality and burden of disease from 2002 to 2030*. PLoS Medicine, 2006, 3(11):e442.
- Moran, M., Guzman, J., Ropars, A. L., McDonald, A., Jameson, N., Omune, B., et al., (2009). Neglected disease research and development: How much are we really spending? *PLoS Medicine*, 6(2), e30.
- Narasimhan, V., & Attaran, A. (2003). Roll back malaria? The scarcity of international aid for malaria control. *Malaria Journal*, 2, 8.
- Nishtar, S. (2009). How important are health systems in the prevention of cardiovascular and other non-communicable diseases? *Nature Clinical Practice Cardiovascular Medicine*, 6(3), 170-171.
- Nugent, R.A., Yach, D., Feigl, A.B. (2009). Non-communicable diseases and the Paris Declaration. *Lancet*, (9692):784-5.
- OECD. (2009). OECD International Development Statistics CD-ROM 2009.
- Over, M. (2008). Prevention Failure: The Ballooning Entitlement Burden of U.S. Global AIDS Treatment Spending and What to Do About It - Working Paper 144. Center for Global Development, Washington, DC.
- Ravishankar, N., Gubbins, P., Cooley, R. J., Leach-Kemon, K., Michaud, C. M., Jamison, D. T., et al., (2009). Financing of global health: Tracking development assistance for health from 1990 to 2007. *Lancet*, 373(9681), 2113-2124.
- Resource Tracking Working Group. (2007). Following the Money: Toward Better Tracking of Global Health Resources. Center for Global Development, Washington, DC.
- Ross, H. Z., Shariff, S., & Gilmore, A. (2008). *Economics of tobacco taxation in Russia*
- Shiffman, J. (2006). Donor funding priorities for communicable disease control in the developing world. *Health Policy and Planning*, 21(6), 411-420.

- Shiffman, J. (2007). Generating political priority for maternal mortality reduction in 5 developing countries. *American Journal of Public Health*, 97(5), 796-803.
- Shiffman J. (2008). Has donor prioritization of HIV/AIDS displaced aid for other health issues? *Health Policy Plan*; 23(2):95-100.
- Szlezák NA, Bloom BR, Jamison DT, Keusch GT, Michaud CM, et al., (2010). The Global Health System: Actors, Norms, and Expectations in Transition. *PLoS Med*, 7(1): e1000183
- Sridhar, D., & Batniji, R. (2008). Misfinancing global health: A case for transparency in disbursements and decision making. *Lancet*, 372(9644), 1185-1191.
- Stuckler, D., King, L., Robinson, H., & McKee, M. (2008). WHO's budgetary allocations and burden of disease: A comparative analysis. *Lancet*, 372(9649), 1563-1569.
- Tandon, A. and C. Cashin. (2010) Assessing Public Expenditure on Health From a Fiscal Space Perspective. HNP Discussion Paper, February. World Bank.
- Uwakwe, R., Ibeh, CC., Modebe, A.I.; Bo, E.; Ezeama, N., Njelita, I. Ferri, C.P., Prince, M. J. (2009). The Epidemiology of Dependence in Older People in Nigeria: Prevalence, Determinants, Informal Care, and Health Service Utilization. A 10/66 Dementia Research Group Cross-Sectional Survey. *JAGS*.
- World Health Organization. (2005). *Preventing non-communicable diseases: A vital investment*.
- World Health Organization. (2008a). *The global burden of disease: 2004 update*
- World Health Organization. (2008b). *2008-2013 action plan for the global strategy for the prevention and control of noncommunicable diseases*. Geneva.
- World Health Organization. (2009a). *National health accounts*. Retrieved 07/25, 2009, from <http://www.who.int/nha/en/>
- World Health Organization. (2009b). New network to combat non-communicable diseases. 2009; Available at: http://www.who.int/mediacentre/news/releases/2009/noncommunicable_diseases_2009_0708/en/index.html. Accessed 08/09, 2009
- World Health Organization Maximizing Positive Synergies Collaborative Group. (2009). An assessment of interactions between global health initiatives and country health systems. *The Lancet*, 373(9681): 2137 – 2169.
- Yach, D., & Hawkes, C. (2004). *Towards a WHO long-term strategy for prevention and control of leading non-communicable diseases*. Geneva: World Health Organization.
- Young, F.; Critchley, J.; Unwin, N. (2009). Diabetes and Tuberculosis: a dangerous liaison & no white tiger. *Indian J Med Res* 130: 1-4.