

SHIFTING PARADIGM



How the **BRICS** Are
Reshaping Global Health
and Development



GHSi
ghsinitiatives.org

ACKNOWLEDGEMENTS

This report was developed by **Global Health Strategies initiatives** (GHSi), an international nonprofit organization advocating for improved access to health technologies and services in developing countries. Our efforts engaged the expertise of our affiliate, Global Health Strategies, an international consultancy with offices in New York, Delhi and Rio de Janeiro. This report comprises part of a larger project focused on the intersections between major growth economies and global health efforts, supported by a grant from the Bill & Melinda Gates Foundation.

GHSi senior leadership, who advised the team throughout development of this report, includes **David Gold** and **Victor Zonana** (New York), **Anjali Nayyar** (Delhi) and **Alex Menezes** (Rio de Janeiro).

Brad Tytel, who directs GHSi's work on growth economies and global health, led the development of the report. **Katie Callahan** managed the project and led editorial efforts.

Chandni Saxena supervised content development with an editorial team, including: **Nidhi Dubey**, **Chelsea Harris**, **Benjamin Humphrey**, **Chapal Mehra**, **Daniel Pawson**, **Jennifer Payne**, **Brian Wahl**.

The research team included the following individuals, however contents do not necessarily reflect the opinions of their respective institutions:

Brazil

Carlos Passarelli, Senior Advisor, Treatment Advocacy, UNAIDS

Cristina Pimenta, Associate Professor, School of Biological Sciences, Veiga de Almeida University

Russia

Kirill Danishevskiy, Assistant Professor, Postgraduate School of Health Management, Department of Public Health, Moscow Sechenov Medical Academy

India

Sagri Singh, Independent Consultant, GHAR Consulting Inc.

China

Guo Yan, Professor, School of Public Health, Peking University Health Science Center

Joan Kaufman, Distinguished Scientist and Senior Lecturer, Heller School for Social Policy and Management, Brandeis University and Lecturer in Global Health and Social Medicine, Harvard Medical School

South Africa

Regina Osih, Independent Consultant, Public Health and Infectious Disease

Matshidiso Masire, BridgingDialogue

Sridhar Venkatapuram, Wellcome Trust Fellow, London School of Hygiene & Tropical Medicine, provided overall guidance.

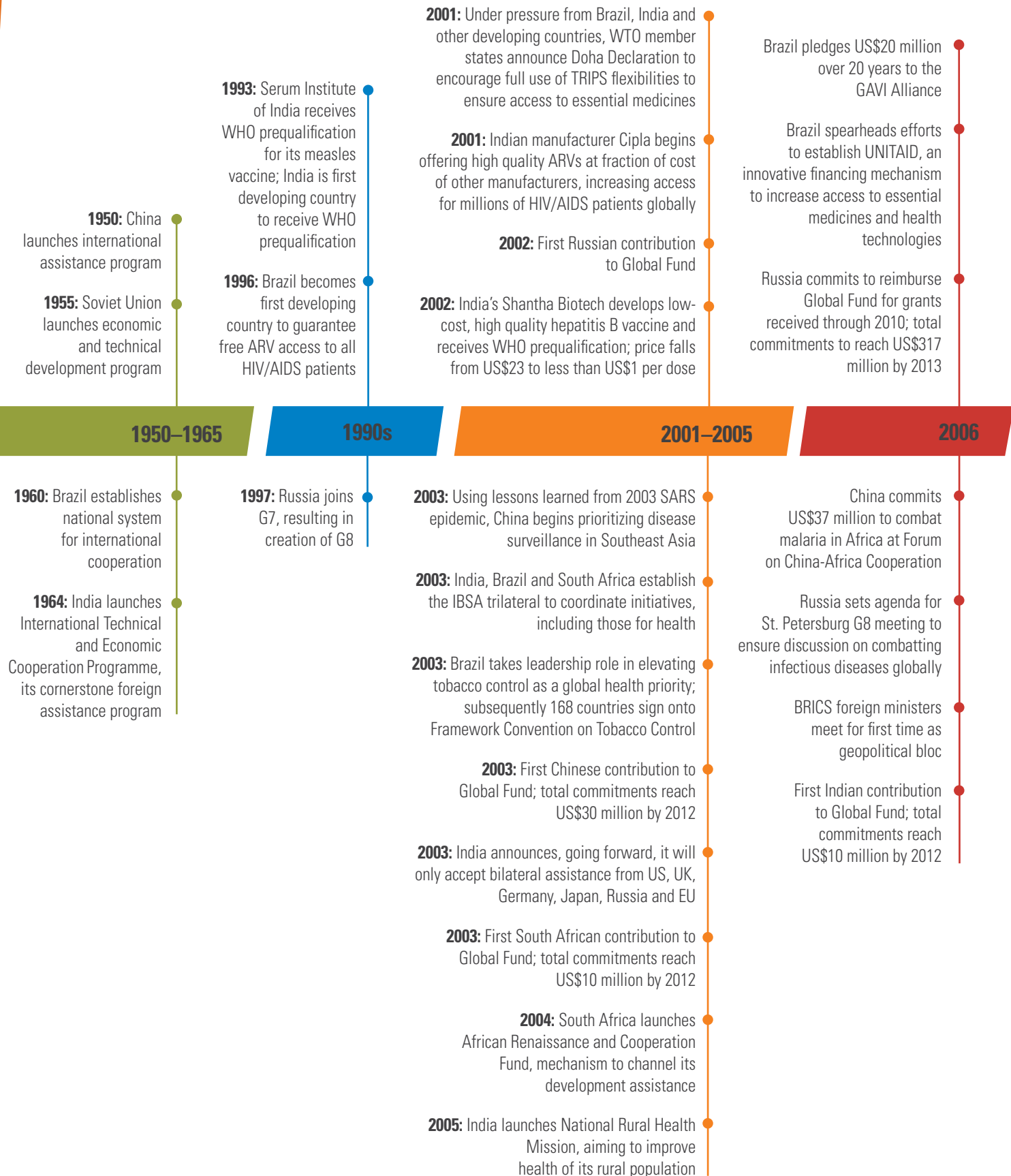
We are extremely grateful to Amy Adelberger, Sanjaya Baru, Nicole Bates, Katherine Bliss, Xiaoqing Lu Boynton, Deborah Brautigam, Martyn Davies, Steve Davis, Samu Dube, Jean Duffy, Ksenia Eroshina, Gabrielle Fitzgerald, Meenakshi Datta Ghosh, Dan Gwinnell, Yanzhong Huang, Suresh Jadhav, Salim Karim, Stephanie Lazar, Donna Lomangino, Ashok Malik, Dai Min, Steve Morrison, Rani D. Mullen, Adrienne Nickerson, Blessed Okole, Linda Patterson, Bin Pei, Pronob Sen, Nina Schwalbe, Markus Steiner, Ian Temple, Vasilij Vlassov and Tom Wheeler for their support and input.

TABLE OF CONTENTS



Executive Summary	5
1. Introduction	13
2. Brazil	19
Brazil Overview	19
Brazil's International Cooperation	21
Brazil's Health Cooperation	24
Brazilian Innovation and Implications for Global Health	29
3. Russia	33
Russia Overview	33
Russia's Foreign Assistance	35
Russia's Health Assistance	37
Russian Innovation and Implications for Global Health	41
4. India	43
India Overview	43
India's Foreign Assistance	45
India's Health Assistance	49
Indian Innovation and Implications for Global Health	51
5. China	57
China Overview	57
China's Foreign Assistance	59
China's Health Assistance	62
Chinese Innovation and Implications for Global Health	66
6. South Africa	71
South Africa Overview	71
South Africa's Foreign Assistance	73
South Africa's Health Assistance and Impact on Global Health Innovation	75
7. Beyond BRICS	79
8. Key Findings and Conclusions	85
Citations	93

KEY MILESTONES OF BRICS' ENGAGEMENT IN GLOBAL HEALTH





LIST OF ACRONYMS

ABC	Brazilian Agency for Cooperation
AMC	Advanced Market Commitment
ARF	African Renaissance and International Co-operation Fund
ARV	Antiretroviral Drugs
AU	African Union
CAPRISA	Centre for the AIDS Program of Research in South Africa
CIS	Commonwealth of Independent States
CNBG	China National Biotec Group
DAC	Development Assistance Committee
DFID	UK Department for International Development
DST	Department of Science and Technology (South Africa)
EPI	Expanded Program on Immunization
FOCAC	Forum on China-Africa Cooperation
GPEI	Global Polio Eradication Initiative
GIZ	German International Cooperation Agency
ICTC	International Centre for Technical Cooperation on HIV/AIDS (Brazil)
IFFIm	International Finance Facility for Immunization
MDR	Multidrug-Resistant
MOFCOM	Ministry of Commerce (China)
MOST	Ministry of Science and Technology (China)
MRC	Medical Research Council (South Africa)
NCD	Non-Communicable Disease
NHI	National Health Insurance (South Africa)
NRF	National Research Foundation (South Africa)
NTD	Neglected Tropical Disease
ODA	Official Development Assistance
OPV	Oral Polio Vaccine
PAHO	Pan-American Health Organization
PPD	Partners in Population and Development
R&D	Research and Development
SAARC	South Asian Association for Regional Cooperation
SADC	Southern African Development Community
SADPA	South African Development Partnership Agency
SCO	Shanghai Cooperation Organization
SFDA	State Food and Drug Administration (China)
SII	Serum Institute of India
TAC	Treatment Action Campaign
TIA	Technology Innovation Agency (South Africa)
TRIPS	Trade-Related Intellectual Property Rights
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
WHO	World Health Organization
WTO	World Trade Organization
XDR	Extensively Drug-Resistant

EXECUTIVE SUMMARY



The enormous and increasing influence of the BRICS countries (Brazil, Russia, India, China and South Africa) can be seen in many areas including economics, politics and culture. The economies of the BRICS have expanded significantly, and in 2011 China overtook Japan to become the second largest global economy. Brazil and India are now sixth and ninth, respectively. While growth in the BRICS has recently begun to slow, to date these countries have shown much greater resilience than the US and Europe in the face of the global financial crisis.

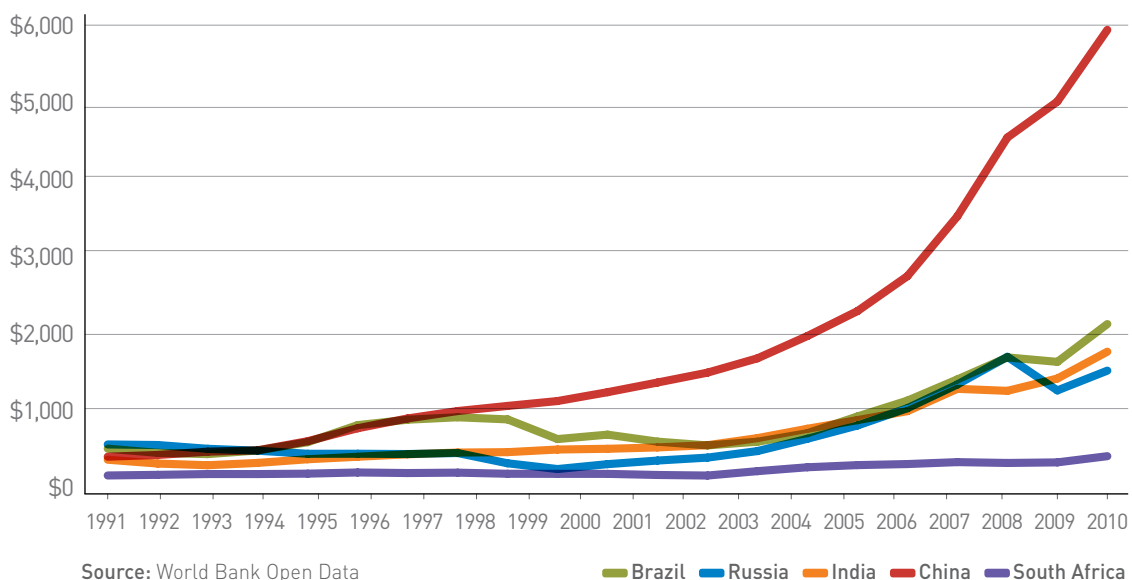
Within this context, BRICS foreign assistance spending has been growing rapidly. Through platforms like the BRICS forum, these countries are also exploring opportunities for more formal collaboration among themselves and with other developing countries. While it is impossible to

gauge the true long-term impact of the BRICS on international development, there is no doubt that it will continue to increase.

At the same time that BRICS foreign assistance spending has grown, funding for global health has slowed as US and European donors struggle amid increasing financial constraints. Some European governments have cut assistance spending dramatically. As a result, there is an urgent need for new health resources and innovation. The world will undoubtedly look to the BRICS for greater leadership in these areas.

This report presents findings from a qualitative and quantitative survey of present and future efforts by Brazil, Russia, India, China and South Africa to improve global health. It examines these roles within the broader context of international

i.1 BRICS ABSOLUTE GDP GROWTH OVER TIME (USD Billions)



development and foreign assistance, though health remains the primary focus. This report also includes a brief look at other emerging powers beyond the BRICS that have potential to impact major global health issues. The goal was to examine existing BRICS assistance programs and contributions to health innovation in order to identify opportunities for the BRICS and other emerging powers to expand upon their achievements and increase their contributions to improving health in the poorest countries.

BRICS IMPACT ON GLOBAL HEALTH

The BRICS are in many ways still developing countries, and they continue to face significant health challenges of their own. So their interest and goals in supporting global health and development efforts are tempered by domestic concerns. Yet at the same time, these countries have all engaged in foreign assistance for decades. BRICS foreign assistance spending is still relatively small when compared to overall spending by the US and Western European countries, but in recent years it has been increasing rapidly. From 2005 to 2010, Brazil's assistance spending grew each year by around 20.4%, India's by around 10.8%, China's by around 23.9%, and South Africa's by around 8%. Russia's assistance increased substantially early in the same period, before stabilizing at around US\$450 million per year.

Today, among the BRICS, China is by far the largest contributor to foreign assistance, and South Africa is estimated to be the smallest by a significant margin. Brazil and Russia prioritize health within their broader assistance agendas, while China, India and South Africa tend to focus on other issue areas. Though their health commitments vary significantly in both size and scope, each of the BRICS has contributed to global health through financing, capacity building, dramatically improved access to affordable medicines, and development of new tools and strategies.

In this context, BRICS policymakers themselves increasingly recognize their potential to have even greater global health impact. At a meeting in 2011, BRICS Ministers of Health publicly declared their commitment to "support and undertake inclusive global public health cooperation projects, including through South-South and

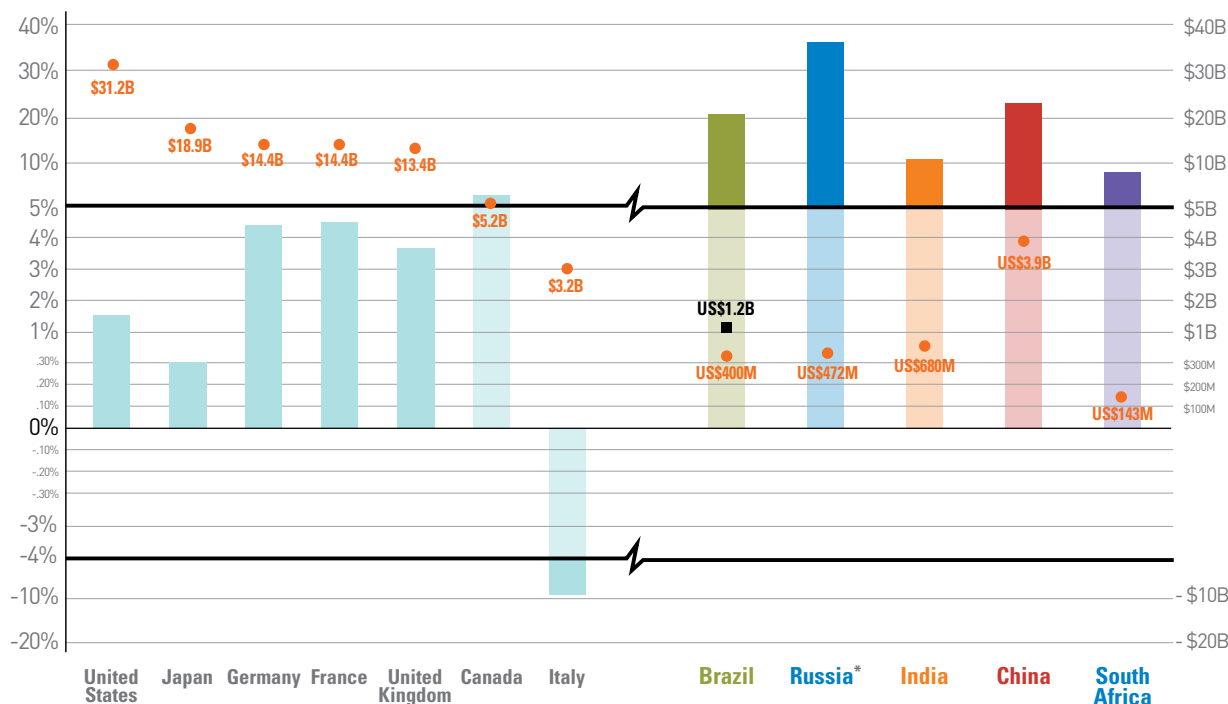
triangular cooperation." They also committed to use the BRICS platform as "a forum of coordination, cooperation and consultation on relevant matters related to global public health." Other global leaders have in turn noted these trends, and some have urged the BRICS and other emerging powers to find new ways to contribute. In a report delivered to heads of government at the 2011 G20 meeting, Bill Gates expressed his excitement at "the potential for these rapidly growing countries to form partnerships with poor countries to advance development."

There are notable differences between the ways the BRICS approach foreign assistance and the methods of traditional donors. Each of the BRICS has made health advances over the past few decades, and policymakers feel this equips them with unique perspective on improving health outcomes in developing countries. The BRICS emphasize "South-South" cooperation and they favor models anchored in domestic programs and their own political and social philosophies. These often include bilateral capacity building and infrastructure development, and draw directly on lessons learned by BRICS policymakers in addressing their own internal challenges. Each BRICS country also employs its own methods, and contributes in unique ways:

BRAZIL

Brazil is the sixth largest economy (nominally) in the world, posting 7.5% growth in 2010, though this slowed to 2.8% in 2011. Brazil has used its global leadership position to champion South-South collaboration, particularly with other Lusophone (Portuguese-speaking) countries. Its approach to international cooperation emphasizes partnership, capacity building and health care access. Brazil does not report annual figures, so its spending is difficult to quantify. Estimates for Brazil's international cooperation spending in 2010 range from US\$400 million to US\$1.2 billion. It is clear that health is a strong focus of these programs, reflecting a longstanding domestic commitment to equity. The Brazilian government is also investing substantial resources in domestic research and development (R&D), with annual public investment increasing 13.5% each year from 2000-2010. This could accelerate the country's ability to supply health technologies globally. Highlights of Brazil's current and potential contributions to global health include:

i.2 G7 VS. BRICS: ESTIMATED ANNUAL GROWTH OF FOREIGN ASSISTANCE PROGRAMS (2005-2010) AND ABSOLUTE ASSISTANCE (2010) (% , USD)



Source: OECD; Institute of Applied Economic Research (IPEA) Report, 2011; *Inter-Press Service*, "Brazil, Emerging South-South Donor"; *The Economist*, "Speak Softly and Carry a Blank Cheque"; Deauville Accountability Report G8 Commitments on Health and Food Security, Ministry of Finance of Russian Federation, 2011; Union Budget and Economic Survey, Ministry of External Affairs, Ministry of Finance, Government of India; Government of India official; "The Dragon's Gift: The Real Story of China in Africa," D. Brautigam; World Bank Open Data; GHSi Analysis

Note: *Russia pledged to steady foreign assistance disbursements between US\$400M and US\$500M

■ Annual Growth (2005-2010)
 ● Absolute Foreign Assistance (2010)
 ■ High Estimate, Absolute Foreign Assistance (2010)

- **HIV/AIDS:** In 1996, Brazil committed to provide universal access to ARV drugs for HIV patients — a goal many global policymakers thought was impossible to achieve in a developing country. Brazil's success in this area and in HIV prevention has significantly influenced the global response to the epidemic. Brazil has drawn on these experiences to support HIV/AIDS programs in other countries, including a US\$21 million investment in building an ARV plant in Mozambique.
- **Child Nutrition:** Brazil is collaborating with other countries and international agencies to help implement local variations of successful Brazilian initiatives, such as its Bolsa Família conditional cash transfer program and its

network of milk banks. To date, Brazil's Ministry of Social Development and Hunger Alleviation has implemented 23 Bolsa Família-inspired projects in more than 50 countries.

- **Multilateral Financing:** Brazil contributed US\$106.5 million to the World Health Organization (WHO) and the Pan-American Health Organization (PAHO) between 2006 and 2009, and pledged an additional US\$20 million over 20 years to the GAVI Alliance. The country also helped spearhead the founding of UNITAID, and has given the organization more than US\$37 million since 2007.
- **Tobacco Control:** Brazil played a leadership role in negotiations for the 2005 Framework

Convention on Tobacco Control, and its aggressive domestic control program is considered a model for other countries.

RUSSIA

Since the fall of the Soviet Union, the Russian economy has rebounded and it is currently ranked 11th in the world in terms of nominal gross domestic product (GDP). Russia has also retained significant regional influence in Eurasia. The country has chosen to align its foreign assistance program with policies established by Western donors through the Organisation for Economic Co-operation and Development's Development Assistance Committee (OECD-DAC). Overall, Russia now spends approximately US\$400 million to US\$500 million each year on foreign assistance. Health is a priority, and between 2006 and 2010, one-fourth of total assistance was allocated for health projects. However the majority of this went to the Global Fund to Fight AIDS, Tuberculosis and Malaria, which has given grants to Russia. The country also provides more support to multilaterals than any of the other BRICS, and is investing heavily in its domestic pharmaceutical industry. Highlights of Russia's current and potential contributions to global health include:

- **Polio and Vaccine Funding:** Russia prioritizes polio eradication in its region and has donated US\$33 million to the Global Polio Eradication Initiative. Russia is also the only BRICS contributor — and one of only six contributors total — to the GAVI Alliance's Advanced Market Commitment (AMC) for pneumococcal vaccines. It has committed US\$80 million to the AMC from 2010 to 2019.
- **Neglected Tropical Diseases (NTDs):** Russia has contributed US\$21 million to NTD control from 2009 to 2012. It is working with neighboring governments and some African countries to conduct NTD needs assessments.
- **Malaria Control:** Russia partners with the World Bank and WHO to strengthen malaria control and prevention programs in Zambia and Mozambique.
- **Pharmaceutical Investments:** In 2011, Russia announced a US\$4.4 billion investment in building capacity for domestic pharmaceutical and medical production and innovation. The goal of this program — known as Pharma 2020

— is to prepare Russia's health care industry for the global market.

INDIA

India has one of the fastest growing economies in the world and the ninth largest GDP (nominally). The country's growth averaged 8.5% annually from 2005 to 2010, and although the rate slowed to 6.1% in the fourth quarter of 2011, Indian policymakers believe growth could go up again in 2013. This growth, combined with a large population, energetic democracy and active foreign policy, has helped expand India's influence regionally and globally. India has increased its foreign assistance budget, and total assistance grew from an estimated US\$443 million in 2004 to US\$680 million in 2010. Yet health has not been a strong focus of assistance programs, as the government has prioritized efforts to address significant domestic health challenges. Meanwhile, India's pharmaceutical industry continues to have enormous global impact, and the country recently launched a US\$1 billion innovation fund to encourage greater R&D for problems afflicting developing countries. Highlights of India's current and potential contributions to global health include:

- **Pharmaceutical and Vaccine Manufacturing:** Indian manufacturers have played a critical role in driving down prices and improving access to vaccines and HIV/AIDS treatments for millions of people worldwide. This includes developing new vaccines such as the MenAfriVac meningitis A vaccine, which was designed specifically for Africa's Meningitis Belt. The Indian government and others are also increasingly investing in early-stage R&D in order to generate innovative health technologies.
- **Global Polio Eradication:** In February 2012, India was officially removed from the list of polio endemic countries. India's polio program was almost entirely self-funded through US\$1.49 billion in support to the global eradication initiative over nine years, and the government and partners mobilized millions of people to assist in immunization campaigns. This important accomplishment has added significant new momentum to global efforts to eradicate polio.
- **E-Health:** India is using its expertise in information technology to assist other countries

in developing e-health platforms. This includes the Pan-African Telemedicine and Tele-Education Network, which links Western African hospitals and universities with their Indian counterparts to facilitate the sharing of best practices.

- **Low-Cost Service Delivery:** Indian organizations have pioneered efforts to expand access to quality health services among the poor. Aravind Eye Hospital, for example, is the world's largest ophthalmological organization, treating 2.4 million patients annually. It provides free or very low-cost services to 65% of patients, deriving its revenues from those who are able to pay. Aravind has provided technical assistance in China and Egypt.

CHINA

China is now the world's second largest economy and boasts a GDP bigger than all its BRICS counterparts combined. The country has also rapidly increased its foreign assistance spending, particularly in Africa. The Chinese government reports that it has committed a total of US\$40.5 billion in foreign assistance since 1950, and assistance budgets grew at an annual rate of 29.4% between 2004 and 2009. In 2010 alone, China is estimated to have disbursed US\$3.9 billion. The majority of China's assistance is provided through bilateral channels. The country is guided by a philosophy of "mutually-beneficial" development that it believes builds self-sufficiency in recipient countries and does not interfere in domestic politics. Health is only a small focus of China's overall assistance budget, but its government has consistently funded some specific health programs. At the same time, the country is investing significant resources and effort in boosting the domestic pharmaceutical industry and expanding overall innovation. Highlights of China's current and potential contributions to global health include:

- **Medical Teams:** Since 1963, China has sent a reported 21,000 medical workers to provide services in 69 countries. These teams also train local medical staff to build capacity.
- **Malaria Control:** China has supported malaria programs in Africa in some form for more than 30 years, but these efforts have recently increased. In 2006, China committed US\$37.6 million for 30 malaria and treatment centers

and the distribution of Chinese-made anti-malarial drugs. In 2009, China committed an additional US\$73.2 million to support a variety of malaria programs and medical facilities across the African continent.

- **Family Planning:** China has been a leader in producing low-cost family planning technologies, in support of its strict domestic policies. Since 2008, Family Health International (now FHI 360) has partnered with Shanghai Dahua Pharmaceutical Co. to accelerate global access to Sino-implant (II), a low-cost injectable contraceptive. By February 2012, more than half a million units had been procured for global use.
- **Investment in Health Innovation:** Chinese R&D spending has grown by 20% every year for the past decade and in 2009, China surpassed Japan to become the world's second-largest investor in R&D after the US. Among other strategies, China has invested US\$1.3 billion in health-related R&D "mega projects" on disease prevention and drug development. In 2011, the Chinese Ministry of Science and Technology also entered into a US\$300 million partnership with the Bill & Melinda Gates Foundation that focuses in part on development of new health technologies for resource-poor countries.

SOUTH AFRICA

South Africa is the most recent addition to the BRICS. While its economy is significantly smaller than those of its counterparts, it is the only African member of the BRICS Forum and of the G20. Currently, its nominal GDP ranks 28th globally. South Africa's foreign assistance program is modest compared to the other BRICS, both because of its smaller economy and because the government is focused on the country's own internal health and development challenges. However, these domestic efforts have influenced the global response to several major health issues. The South African government is also strategically investing in indigenous health R&D that targets domestic priorities. Highlights of South Africa's current and potential contributions to global health include:

- **HIV/AIDS:** South Africa's recent efforts to combat HIV/AIDS have helped shape global health research and policy, and its health activist community has provided inspiration and

models for other countries. One key research contribution was the CAPRISA 004 study, designed and led by South African researchers and partially funded by the South African government. This study demonstrated proof of concept that a vaginal gel containing an ARV could prevent HIV transmission in women.

- **R&D Financing:** South African investment in R&D has increased steadily, and was US\$2.6 billion in 2008. The government has set a goal of reaching 2% of GDP by 2018. A key resource for translational health research is the government-funded Technology Innovation Agency (TIA). Launched with an initial budget of US\$54 million, TIA currently supports multiple health R&D initiatives, including a Drug Discovery and Development Centre and several clinical trials.
- **Tuberculosis (TB) Diagnostics:** On World TB Day 2011, South Africa announced plans for national roll-out of GeneXpert, a next-generation molecular TB diagnostic. This is by far the strongest commitment that any country has made to molecular TB diagnostics. If the tool proves to have an impact, South Africa's decision could significantly influence adoption in other high-burden countries.
- **Vaccine Supply:** South Africa's largest vaccine distributor, the Biovac Institute, hopes to become a full-fledged manufacturer by 2013. The institute, which is a public-private partnership, supplies all eight vaccines that comprise South Africa's Expanded Programme on Immunisation and also supplies vaccines to Namibia, Botswana and Swaziland.

BEYOND BRICS

In addition to traditional donor governments and the BRICS, a number of other countries are already having a significant impact on global health and development. Some of these countries have robust foreign assistance programs, while others are driving innovation for affordable health technologies. Highlights of these emerging powers' current or potential contributions to global health include:

- **The Gulf States** all contribute to global health multilaterals. This includes Saudi Arabia's US\$53 million pledge and Kuwait's \$4.5 million

Our goal in this report is to examine existing BRICS assistance programs and health innovations to better understand their impact and opportunities going forward.

pledge to the Global Fund; and the Crown Prince of Abu Dhabi's US\$33 million pledge to the GAVI Alliance. Saudi Arabia, Kuwait and the UAE have all also supported polio eradication efforts, particularly in Pakistan and Afghanistan.

- **Turkey's** 2010 budget included US\$68 million toward basic health, water and sanitation assistance projects, including small donations to polio eradication. Turkey's growing pharmaceutical industry is also a significant potential exporter of generic drugs.
- **Indonesia** produces 15 WHO prequalified vaccines through its state-owned vaccine company, Bio Farma. It has also been a leader in health assistance policy among developing countries.
- **Mexico** provides bilateral development aid within Latin America, including some health projects, and it recently launched the Mexican International Development and Coordination Agency. At the same time, the Carlos Slim Health Institute, based in Mexico City, provides significant funding for health programs throughout Central America.
- **South Korea** provided US\$136 million in health assistance in 2010, and has contributed moderately to several health multilaterals, including the Global Fund and the GAVI Alliance. The country has also helped develop vaccines targeting diarrheal, respiratory and neglected viral diseases through its International Vaccine Institute (IVI).

KEY FINDINGS

Our research has produced a number of key findings that highlight some of the BRICS' current and potential impact on global health:

- **The BRICS are all established providers of foreign assistance; however their contributions have increased significantly over the last five years.**

- **The BRICS are employing approaches to foreign assistance that are different from traditional donors and shaped by domestic experiences.**
- **As with Western donors, economic and political interests are influencing the BRICS as they expand their development and health assistance programs.**
- **Innovative domestic health programs and policies in the BRICS are increasingly influencing health practices globally.**
- **The production of high-quality, lower-cost health technologies by the BRICS is improving access in resource-poor countries, and the growing investment in early-stage R&D by the BRICS could have a similar long-term impact.**
- **The BRICS have declared health collaboration a priority, but they have not yet begun to work collectively to enhance the impact of their assistance programs.**

Overall, the BRICS are beginning to play an important role in regional and global health through foreign assistance and other efforts. Notably, the production of low-cost drugs, diagnostics and vaccines by the BRICS will continue to provide significant benefits to developing countries. So too will the BRICS' increased investments in health innovation.

At the same time, there are a number of areas where more coordinated efforts by the BRICS could have even greater impact on global health. This could be through assistance, innovation or increased support for relevant partnerships and multilaterals. A few specific examples might include:

- **Providing political and technical support to accelerate access to life-saving vaccines**
- **Catalyzing access to innovative TB tools and strategies**
- **Supporting efforts to eradicate polio**
- **Increasing leadership on NCDs and tobacco control**

- **Strengthening regional disease surveillance networks**
- **Helping to harmonize global regulatory processes**

CONCLUSIONS

All of the BRICS face significant domestic health and development challenges, but they are increasingly engaging in global health. These countries are also scaling up investments in innovation and exploring cooperative mechanisms that can benefit developing countries. The potential benefits of collaboration were highlighted at the 2011 Ministers of Health meeting, where the BRICS declared their commitment to work together on common health challenges.

Importantly, Brazil, Russia, India and South Africa all have or are launching central assistance agencies. China's assistance program involves a variety of government agencies led by the Ministry of Commerce. However, in 2011 China released a white paper that provided a formal, public overview of its approach to international development. As the scale of China's assistance efforts grow, a central aid agency could help maximize the impact of its investments. Across the BRICS, better management systems, more coordination across agencies, and increased monitoring and evaluation will likely be needed.

Like traditional donors, the BRICS have their own motives for engaging in international assistance, and there are, to be sure, reasonable concerns about the effectiveness of their programs. Yet these countries represent a potentially transformative source of new resources and innovation for global health and development. Their approaches will vary from those of traditional donors, and will be shaped by their own experiences, philosophies and interests. But over the long-term, the BRICS are sure to play an important role in helping to improve the health and well-being of the world's poorest countries. ●

Sources and methodology for qualitative and quantitative findings can be found in the full report

BRICS: FOREIGN ASSISTANCE AND GLOBAL HEALTH

Indicator	Brazil	Russia	India	China	South Africa
Launch of Foreign Assistance Program	1960	1955	1964	1950	1968
Estimated Absolute Foreign Assistance (2010)	US\$400M – US\$1.2B	US\$472M	US\$680M	US\$3.9B	US\$143M
Foreign Assistance Estimated Compound Annual Growth Rate (2005 - 2010)	20.4%	36.1%	10.8%	23.9%	8.0%
Central Assistance Agency	Brazilian Cooperation Agency (ABC)	None currently; RUSAID launch currently on hold	Development Assistance Partnership (oversees administration); central agency to launch in 2012	None currently; MOFCOM manages majority of assistance projects	None currently; South African Development Partnership Agency (SADPA) planned
Foreign Assistance Regional Focus	<ul style="list-style-type: none"> Latin America Africa Lusophone countries 	<ul style="list-style-type: none"> CIS region Looking toward Africa 	<ul style="list-style-type: none"> Regional neighbors (i.e. Bhutan, Afghanistan, Nepal) Increasingly looking toward Africa 	<ul style="list-style-type: none"> Africa Asia 	<ul style="list-style-type: none"> Africa
Foreign Assistance Sector Focus	<ul style="list-style-type: none"> Health Education Agriculture 	<ul style="list-style-type: none"> Health Education Food security 	<ul style="list-style-type: none"> Infrastructure Information technology Training and capacity building 	<ul style="list-style-type: none"> Infrastructure Industrial development Energy resources development 	<ul style="list-style-type: none"> Peacekeeping Democracy promotion
Global Health Focus	<ul style="list-style-type: none"> Access to medicines HIV/AIDS Capacity-building/ infrastructure development Social determinants of health 	<ul style="list-style-type: none"> Infectious diseases Disease surveillance NCDs Global Fund 	<ul style="list-style-type: none"> Health infrastructure Health IT Capacity building Medical missions 	<ul style="list-style-type: none"> Medical teams Malaria treatment Health infrastructure Human resources 	<ul style="list-style-type: none"> Limited focus on global health
Key Innovations and Implications for Global Health	<ul style="list-style-type: none"> Government responsible for majority of country's health R&D/innovation to date; transitioning from generics to biotech innovator with emphasis on affordability Private sector contributions limited though government recently increased investment in R&D; private sector recognized as critical to filling existing gap in product development pipeline 	<ul style="list-style-type: none"> Government focused on infectious diseases, particularly HIV/AIDS Academia considered 'Center of Knowledge and Science' for CIS region Private sector contributions limited to date; government investing in capacity around domestic production, innovation 	<ul style="list-style-type: none"> Vaccine industry with most WHO prequalified vaccines; contributes between 60% and 80% of all UN procured vaccines Private sector spurred global access to generic ARVs Public and private sector working on low-cost service provision for poorest of the poor Government investing in innovation around health technologies 	<ul style="list-style-type: none"> Government investing more than US\$1.3B in R&D for drug development, infectious disease control/prevention Government partnering with the Gates Foundation to fund development, production of new low-cost health technologies Robust health manufacturing sector starting to look to global market 	<ul style="list-style-type: none"> Government focused on infectious diseases, R&D and support for clinical/research trials, particularly around HIV/AIDS and TB Government spurring uptake of next-generation health technologies Private sector manufacturing generic ARVs

1 INTRODUCTION

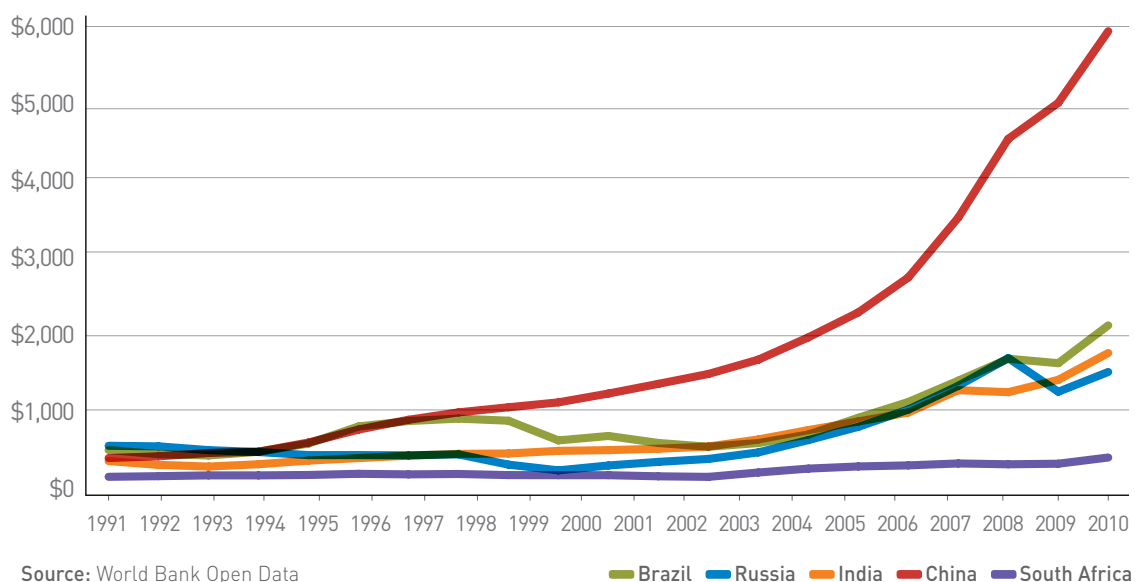
In March 2012, the heads of government of Brazil, Russia, India, China and South Africa will gather in New Delhi for the fourth annual BRICS Summit. Since 2001, when Jim O'Neill, then Head of Global Economic Research at Goldman Sachs, coined the acronym "BRIC" to refer to what he predicted would be the four fastest growing emerging economies, the term has become common shorthand. The enormous — and still growing — influence of the BRICS can be seen in many areas including global economics, politics, development and culture.

At the same time, the BRICS have chosen to claim the acronym for themselves to formalize their affiliation and increase their stature. The BRICs first met exclusively in 2006, and the first formal annual summit took place in Russia in June 2009.

In late 2010, South Africa was invited to join the group — making the BRICs the BRICS.

Starting from their first meeting, the governments of the BRICS have expressed their interest in

1.1 BRICS ABSOLUTE GDP GROWTH OVER TIME (USD Billions)



Source: World Bank Open Data

— Brazil — Russia — India — China — South Africa

building an alternative platform for cooperation on issues including health, economics, science and technology. This would build on each of their long-standing international ties, and it would seek to appeal to other developing countries that might see the BRICS as more equal partners. The BRICS forum exemplifies how these countries and others like them are emerging as major actors and asserting themselves on the global stage. As an example, in February 2012, India proposed that the BRICS create a multilateral bank that would be exclusively funded by developing nations and finance projects in those countries. Regarding health specifically, the BRICS Ministers of Health met in July 2011 and declared their commitment to collaboration on common health challenges, and to “support other countries in their efforts to promote health for all.”

Each of the BRICS faces its own domestic challenges and collaboration among them has been slowed by their political and cultural differences. Yet they are all increasing their

The BRICS Ministers of Health met in July 2011 and declared their commitment to collaboration on common health challenges, and to “support other countries in their efforts to promote health for all.”

engagement in global issues and doing so with different goals, tactics and rationales than those of Western powers — which means their impact should be considered on their own terms.

THE BRICS AND GLOBAL HEALTH

Alongside others, the global health community has been looking to the BRICS with an evolving set of interests. Most of the BRICS, aside from Russia, have traditionally been viewed as targets for global health assistance because they are still considered developing countries. Large portions of their populations live below the poverty line, they face significant domestic health challenges,

1.2 BRICS ECONOMIC AND HUMAN DEVELOPMENT INDICATORS*

Indicator	Year	BRICS					Other Leading Economies	
		Brazil	Russia	India	China	South Africa	United States	Japan
Population, total	2010	194,950,000	141,750,000	1,170,938,000	1,338,299,000	49,991,000	309,052,000	127,450,000
Reserves of Foreign Currency and Gold and Rank	2011	US\$357.9B 7	US\$513.0B 5	US\$345.8B 8	US\$3.2T 1	US\$50.3B 38	US\$132.4B 20 (2010)	US\$1.1T 2 (2010)
Life expectancy (years)	2009	72.8	68.6	64.8	73.1	51.6	78.1	82.9
Literacy rate, adult total (% of people ages 15 and above)	-	90.0 (2008)	99.6 (2009)	62.8 (2006)	93.0 (2009)	88.7 (2007)	-	-
GDP Per Capita, PPP (current US\$)	2010	\$11,200	\$19,800	\$3,600	\$7,600	\$10,600	\$47,200	\$33,800
Income inequality measured by GINI coefficient**	-	36.8 (2004)	41.5 (2005)	42.2 (2009)	53.9 (2009)	65.0 (2005)	45.0 (2007)	37.6 (2008)
CO ₂ emissions (kt)	2008	393,000	1,709,000	1,743,000	7,032,000	436,000	54,561,000	1,208,000
Mobile cellular subscriptions (per 100 people)	2009	90.0	162.5	45.4	56.1	94.2	89.3	90.1
Health expenditure per capita, PPP (constant 2005 international \$)	2009	\$940	\$1,040	\$130	\$310	\$860	\$7,400	\$2,700

Source: World Bank Open Data; CIA World Factbook

Note: *World Bank and CIA World Factbook indicators were used over local sources to allow for cross-country analysis;

** The higher the GINI coefficient, the larger income inequality

BRICS-Initiated Development Bank

During a meeting of G20 finance ministers in February 2012, India proposed setting up a multilateral bank that would be exclusively funded by developing nations and finance projects in those countries. This proposal is currently under discussion and will likely be addressed in more depth at the March BRICS Summit. The idea for the bank builds on a pledge BRICS leaders made at their 2011 Summit in China, where they promised to “strengthen financial cooperation among the BRICS Development Banks.” While details are unavailable, the bank could follow the model of other institutions, such as the Islamic Development Bank, based in Saudi Arabia, which fosters economic development and social progress among its dues-paying member countries — all of whom belong to the Organisation of Islamic Cooperation.

BRICS Health Ministers’ Beijing Declaration

In July 2011, the Ministers of Health from the BRICS met in Beijing for the first annual BRICS Health Ministers Meeting. At the conclusion of the summit, they issued the Beijing Declaration, which emphasized the importance of collaboration and innovation in public health across the BRICS and with other countries. In the declaration, the BRICS collectively committed to, among other things:

- Strengthen health systems and overcome barriers to access for health technologies that combat infectious and non-communicable diseases, particularly HIV, TB, viral hepatitis and malaria
- Explore and promote technology transfers to strengthen innovation capacity and benefit public health in developing countries
- Work with international organizations including WHO, the GAVI Alliance, UNAIDS and the Global Fund to increase access to medicines and vaccines

and all of them have received donor funding focused on helping them improve their health indicators. Given the size of China and India’s populations alone, improvements in the health of the BRICS fit the very definition of improving global health.

With donor spending from the US and Europe slowing or declining, however, there is an urgent need for new global health resources and champions. A number of global health programs and institutions are facing major financial shortfalls, as exemplified by the recent cancellation of the Global Fund to Fight AIDS, Tuberculosis and Malaria’s Round 11 funding.

With this in mind, international organizations have started looking to the BRICS as potential donors and health innovators in their own right.

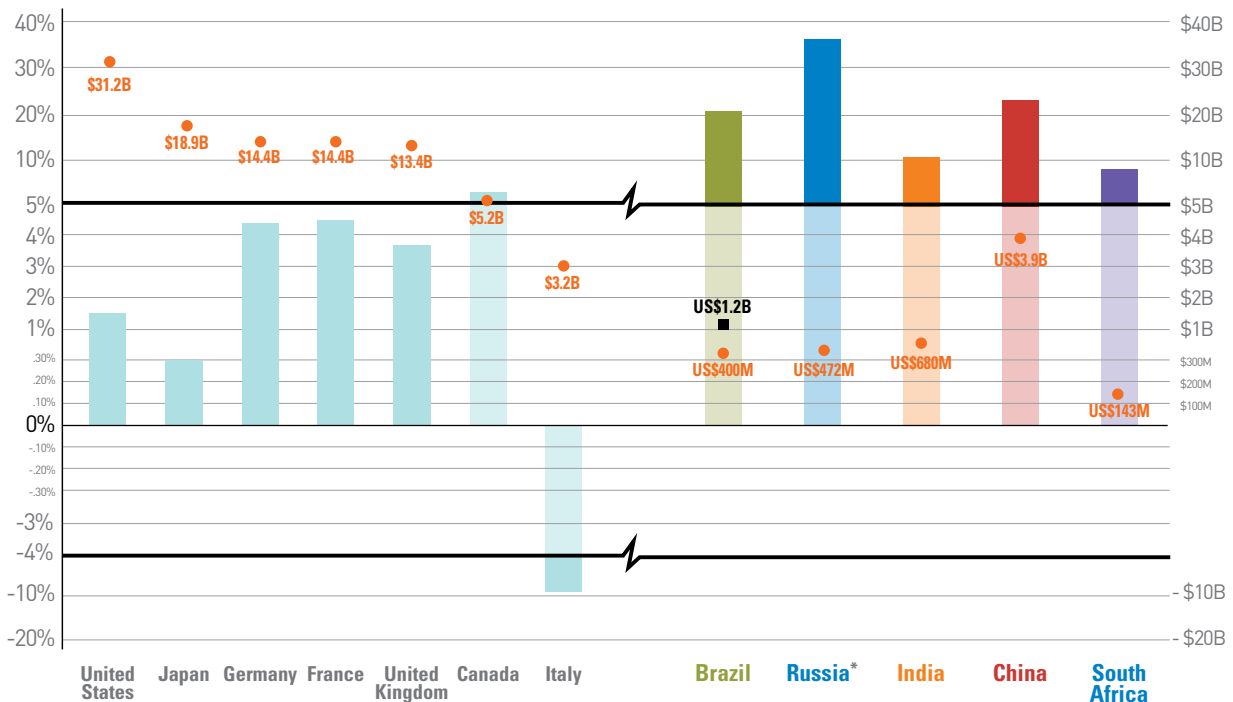
Just as the G20 — which includes all five of the BRICS — is eclipsing the G8 as the premier forum for discussions on world affairs, there is a growing sense that BRICS governments can play a greater role in improving health in less

developed countries. There is also excitement about the role their public and private sectors could play in producing the next generation of effective, low-cost health technologies and strategies, with or without support from international partners.

This focus on the BRICS belies the fact that all five countries are already contributing to health beyond their borders, and have been doing so since long before the term “BRICS” existed. For example, manufacturers in several BRICS — particularly India — have been a source of drugs, vaccines and diagnostics used in the poorest countries; through policy and activism, Brazil and South Africa have been highly influential in advancing the global response to HIV/AIDS; China has been a significant contributor to malaria

International organizations have started looking to the BRICS as potential donors and health innovators in their own right.

1.3 G7 VS. BRICS: ESTIMATED ANNUAL GROWTH OF FOREIGN ASSISTANCE PROGRAMS (2005-2010) AND ABSOLUTE ASSISTANCE (2010) [% , USD]



Source: OECD; Institute of Applied Economic Research (IPEA) Report, 2011; *Inter-Press Service*, "Brazil, Emerging South-South Donor"; *The Economist*, "Speak Softly and Carry a Blank Cheque"; Deauville Accountability Report G8 Commitments on Health and Food Security, Ministry of Finance of Russian Federation, 2011; Union Budget and Economic Survey, Ministry of External Affairs, Ministry of Finance, Government of India; Government of India official; "The Dragon's Gift: The Real Story of China in Africa," D. Brautigam; World Bank Open Data; GHSi Analysis
Note: *Russia pledged to steady foreign assistance disbursements between US\$400M and US\$500M

- Annual Growth (2005-2010)
- Absolute Foreign Assistance (2010)
- High Estimate, Absolute Foreign Assistance (2010)

control in Africa; and Russia is one of just six national donors to the GAVI Alliance's Advance Market Commitment (AMC).

The BRICS are also supporting health and development in different and sometimes less tangible ways than what we expect of traditional donor countries. The BRICS explicitly reject many models used by Western donors, and are instead trying to utilize innovative approaches to global health engagement that are rooted in their own domestic experiences. They are also influenced by geography and the history and connections they share with other developing countries.

Many of the BRICS' global health and development efforts are having positive impact.

Yet some critics argue that they lack accountability, do not coordinate with international efforts, and need better monitoring and evaluation. BRICS assistance is also often driven by mixed motives, slowed by capacity challenges, and faced with unrealistic expectations from many global stakeholders. In this way, they may not be all that different from the very Western models they seek to replace.

The BRICS explicitly reject many models used by Western donors, and are instead trying to utilize innovative approaches to global health engagement that are rooted in their own domestic experiences.

OECD

The Organisation for Economic Co-operation and Development (OECD) is an international organization comprised of 34 countries that acts as a forum for global economic analysis and policy formation. The OECD's Development Assistance Committee (DAC) provides a venue for the largest aid donors, including governments and multilateral organizations, to discuss approaches to development assistance. The DAC also sets an official definition for development assistance and tracks aid flows from Member States. None of the BRICS are OECD members, although Russia is currently in discussions for membership and Brazil, China, India and South Africa have all been offered "enhanced engagement" status. This allows for heightened involvement in OECD activities and could lead to future membership.

THE REPORT

In our work in global health, the GHSi team and partners have identified specific examples of ways that the BRICS and other emerging powers have independently impacted key health challenges in a variety of ways. And we have seen clear opportunities where BRICS country institutions could apply their unique experiences and expertise and have even greater positive effect.

Our goal in this report is to examine existing BRICS assistance programs and health innovations, to better understand their impact and opportunities going forward. We use the BRICS platform as an opportunity to look at the individual and collective activities of these five prominent countries specifically, while keeping in mind the contributions of other emerging countries, such as those in the G20, that are not generally recognized as donors.

The scope of this report is broad, and includes the public sector and government spending for health assistance, as well as the private sector, domestic innovation, and innovative policy and advocacy. Across all of this, we

The Global Fund and Round 11 Funding

Since the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) was founded in 2002, it has disbursed nearly US\$16 billion in funding over ten rounds of grant-making and helped to provide disease prevention and treatment programs to millions of people in developing countries. Nearly 3.3 million people in Africa alone now have access to ARV therapy for HIV/AIDS because of Global Fund grants.

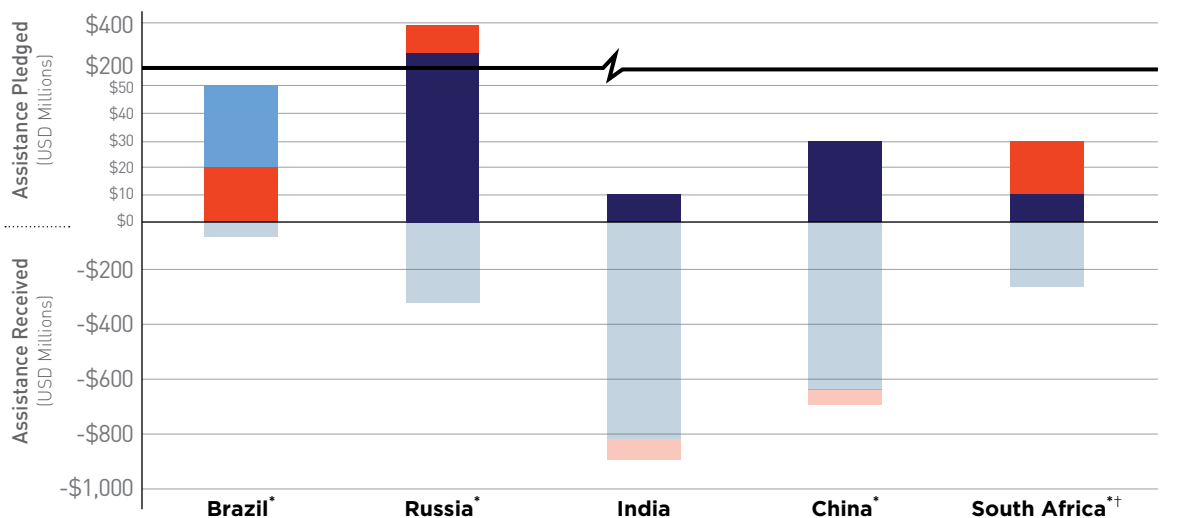
In recent years, however, the Global Fund has faced a serious funding shortfall as many traditional donors have scaled back support in the face of the global financial crisis and allegations of mismanagement. During its 2010 fundraising, the Global Fund obtained US\$11.7 billion in new commitments, US\$1.3 billion short of its minimum projected budget. In 2011, the Global Fund Board announced the cancellation of the Round 11 funding cycle — effectively cutting off new grants until 2014. In addition, the Board announced that funding for upper-middle-income countries including Brazil, Russia, China and Mexico would be limited going forward.

focus on presenting the priorities, policies and perspectives of the BRICS countries themselves. In examining the impact of the BRICS on health outside their borders, the report attempts to look beyond the definitions of development assistance that have been commonly used by traditional donors. However, we do not measure the specific effectiveness of individual approaches.

METHODOLOGY AND DEFINITIONS

Our methodology included a literature review, in-country interviews, and data analysis. The report includes both qualitative and quantitative findings collected through research in each individual country. Sources include international and domestic primary and secondary sources, and key in-country health and development experts. While this approach has allowed us to take a broad and

1.4 BRICS AND KEY HEALTH MULTILATERALS: TOTAL PLEDGES AND ASSISTANCE RECEIVED (USD Millions)



Source: Global Fund, GAVI Alliance, UNITAID

Note: Health Multilateral Launches: GAVI Alliance - 2000, Global Fund - 2002, UNITAID - 2006;

*Brazil, Russia and South Africa were never eligible for GAVI Alliance support (based on GNI per capita requirements) and China graduated from eligibility in 2006;

**UNITAID does not have distribution programs. Rather it supports partner programs, including Global Fund, WHO, Clinton Foundation;

†South Africa has committed to supporting UNITAID in the future; Data accurate as of 17 March 2012

■ Global Fund
■ GAVI Alliance
■ UNITAID**

flexible look at the BRICS and global health, we have been limited by challenges accessing data that is not publicly available.

At the same time, because each of the BRICS perceives health assistance and foreign assistance differently — as aid, assistance, or cooperation — each section defines assistance based on that country's own approach. These definitions typically include capacity building, technical assistance, preferential loans and other mechanisms.

NOTE ON ASSISTANCE-RELATED DATA: The numbers we use to quantify foreign assistance spending by the BRICS and other countries are based on publicly-available resources and grounded in the definitions of "assistance" used by individual countries — whether traditional aid provider or member of the BRICS. For G7 country historic aid figures we relied on OECD data. For BRICS foreign assistance figures we relied on in-country sources and, when necessary, select international publications as well as our best judgement. As noted in individual figures, a few

numbers are our own estimates. They are based on these resources and existing trends.

REPORT STRUCTURE

The body of the report is divided into six chapters. Each of the first five chapters is focused on one of the BRICS. This is followed by one chapter that provides a snapshot of other emerging powers that are not generally seen as donors but whose public or private sectors are engaged in notable health activities: the Gulf States, Indonesia, Mexico, South Korea and Turkey. Each section explores key implications of the countries' involvement in the field of global health. This is followed by our conclusions.

Given the enormity of this topic and limitations in data, our findings are not intended to be definitive. However, while each of the BRICS faces its own challenges and exhibits its own motives and contradictions, they are all having significant impact on the global health landscape. As the BRICS' role in global health continues to expand, so will their influence. ●



2 BRAZIL

A decade after coining the term “BRIC,” Goldman Sachs economist Jim O’Neill remarked that Brazil’s growth had surprisingly overshadowed its counterparts and exceeded all economic projections. His observation highlights the significant economic and sociopolitical changes that have transformed Brazil from a regional to global power with dramatic speed.¹ After decades of political and economic instability, Brazil entered the 21st century as a vibrant democracy and the economic engine of Latin America. At the same time, Brazil’s political leaders are looking outward and actively pursuing an influential role in regional and international affairs as a “champion” of the Global South. Brazil’s approach to international cooperation is heavily influenced by its progressive domestic social policies, including a strong emphasis on equity and access to health care and development.

ECONOMIC LANDSCAPE

Brazil is currently the world’s sixth largest economy and the second largest among the BRICS. Economists project Brazil will surpass France to become the world’s fifth largest economy by 2016.^{2,3} Much of the country’s economic success can be traced to the fiscal and social policies of the last two presidents: Fernando Henrique Cardoso and Luiz Inácio Lula da Silva (Lula). Lula in particular is considered to be one of the most successful national leaders in recent decades. Brazil’s GDP per capita (PPP) more than doubled since 1990 to US\$11,220 in 2010. Sound economic policy and a robust domestic market also enabled Brazil to be one of the first emerging market economies to recover from the recent global financial crisis. While Brazil’s economy contracted 0.6% in 2009, Brazil posted 2.7% growth in 2011.⁴

Brazil’s economy is largely fueled by manufacturing and natural resources — primarily oil, timber and minerals. Industry comprises 28% of the country’s gross domestic product (GDP) and agriculture accounts for 6%.⁵ The country is also an appealing destination for foreign investment due to its growing middle class, abundant natural resources and high interest rates.^{6,7} A substantial amount of this is from China, which invested at least US\$12 billion in Brazil in 2010 — largely in extractive industries — and continues to ramp up investment in this and other sectors.⁸ Brazil has also dedicated significant resources toward developing its domestic science and technology sector, with the goal of becoming a leading source for innovation.

Despite all of this progress, Brazil still faces serious domestic challenges. Infrastructure gaps and social inequality could undercut continued

progress, and the World Bank currently ranks Brazil as the 13th most unequal country globally by the Gini index. The Brazilian government has been investing in a range of social programs, including increases in the minimum wage and conditional cash transfer programs. These have helped lift 28 million Brazilians out of severe poverty over the past ten years. However, increased innovation is needed to ensure sustained growth and wider access to the benefits of this growth.⁹

DOMESTIC POLITICS AND FOREIGN AFFAIRS

After 20 years of military dictatorship, Brazil transitioned to a fragile democracy in 1984. While initial governments struggled to achieve political and social stability, Brazil today is a much stronger and vibrant democracy under President Dilma Rousseff. As Lula's chosen successor, she is broadly popular and has continued many of the policies of the previous administration.¹⁰

Globally, Brazil's economic wealth and geopolitical influence have given it an increasingly important voice in international affairs. Brazil is a member of the G20, the World Trade Organization (WTO), the Union of South American Nations (UNASUR) and the Mercosur community. The country will also host the 2012 United Nations Conference on Sustainable Development (Rio+20), the 2014 FIFA World Cup and the 2016 Olympic Games. Brazil played visible roles within the WTO and the World Health Organization (WHO) around intellectual property (IP) regulations and patent laws. At the same time, in May 2007, the Organisation for Economic Cooperation and Development (OECD) offered Brazil — along with China, India and South Africa — the opportunity for “enhanced

Brazil prioritizes foreign relations and economic partnerships with Latin American countries and other Lusophone countries, including those in Africa. However, the government has also sought to position itself as a leading voice for the broader Global South.

IBSA

Established in 2003, the India-Brazil-South Africa Dialogue Forum (IBSA) is a coordinating mechanism for South-South cooperation across the three member states — which are united by the fact that they are all emerging “multiethnic and multicultural democracies.” IBSA organizes annual heads of state summits, and each country donates US\$1 million annually to the “IBSA Fund” to support projects aimed at fighting hunger, poverty and disease. The goal is to build ties together and facilitate partnerships with less-developed countries. IBSA also has 16 working groups focused on areas of mutual interest and potential cooperation. Health is one of IBSA's major focus areas, and its efforts aim to address shared disease priorities including TB, HIV/AIDS and malaria, particularly through innovation and R&D.

engagement.” This is widely understood as creating a path for Brazil to officially join the OECD in the near future.¹¹

In terms of South-South cooperation, Brazil prioritizes foreign relations and economic partnerships with Latin American countries and other Lusophone countries, including those in Africa. However, the government has also sought to position itself as a leading voice for the broader Global South. In addition to the BRICS forum, Brazil also engages in direct dialogue with India and South Africa through the India-Brazil-South Africa (IBSA) trilateral framework.

DOMESTIC HEALTH LANDSCAPE

Brazil's domestic health indicators have improved in recent decades, due in part to its sustained focus on health care access. Brazil's approach to health care places heavy emphasis on reducing socioeconomic disparities and this is reflected in its universal health care system, the Unified Health System (SUS). The Brazilian constitution recognizes health as a citizen's right and state's duty; the SUS is structured around this principle

and guarantees universal access to primary, secondary and tertiary care. Nearly 80% of Brazil's population receives health care in the public sector through the SUS, although coverage rates and service quality vary widely across different regions.^{12,13,14} In 2010, the government's expenditure on health care — US\$734 per capita — represented 9% of Brazil's GDP.¹⁵

Brazil is recognized by health activists worldwide for its commitment to providing universal antiretroviral (ARV) drug access to Brazilians living with HIV and for its emphasis on HIV prevention. The country has maintained a national adult HIV/AIDS prevalence rate close to 0.61% since 2000.¹⁶ Brazil also prioritizes domestic production of essential medicines and health technologies as a means to increase and sustain access. Many vaccines are produced domestically and immunization rates are very high, with measles coverage alone near 99%.¹⁷

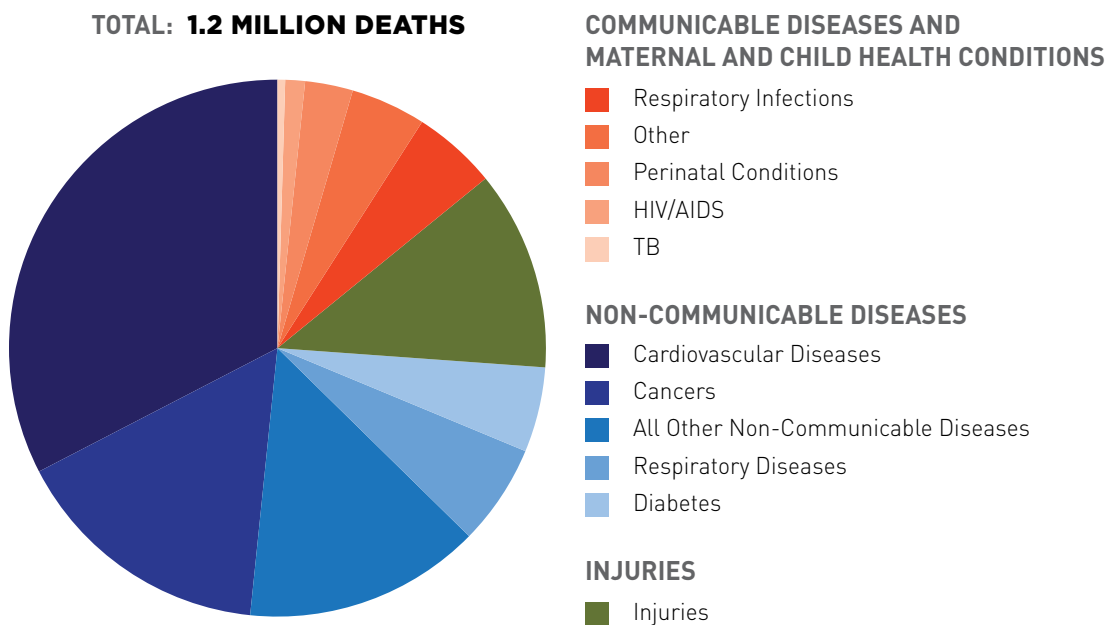
Like other emerging economies undergoing similar demographic shifts, Brazil faces a growing

burden of non-communicable diseases (NCDs). NCDs now account for 74% of the causes of mortality (Figure 2.1). Approximately 40% of the adult population has high blood pressure and more than 7 million Brazilians are diabetic.^{18,19} This shifting disease burden is likely to strain Brazil's health infrastructure in the years to come — and is already impacting programmatic priorities of the SUS.

Brazil's International Cooperation

Brazil's approach to "international cooperation" — which is how the government prefers to define its foreign assistance — is rooted in the country's belief in horizontal cooperation and is shaped in large part by policymakers' commitment to social equity. Through its international cooperation efforts, Brazil has sought to pass along

2.1 BRAZIL LEADING CAUSES OF DEATH, 2008



Source: WHO Global Burden of Disease, 2008

Brazil's approach to "international cooperation" — which is how the government prefers to define its foreign assistance — is rooted in the country's belief in horizontal cooperation and is shaped in large part by policymakers' commitment to social equity.

achievements and lessons learned in tackling its domestic priorities, such as HIV/AIDS control and poverty elimination. At the same time, Brazil's cooperation strategies echo its foreign policy priorities, which include the country's aspirations to become a Global South leader and to obtain a United Nations (UN) Security Council seat.^{20,21} In expanding its network of partner countries through cooperation, Brazil has been able to proactively expand its global influence.²²

TRENDS IN INTERNATIONAL COOPERATION

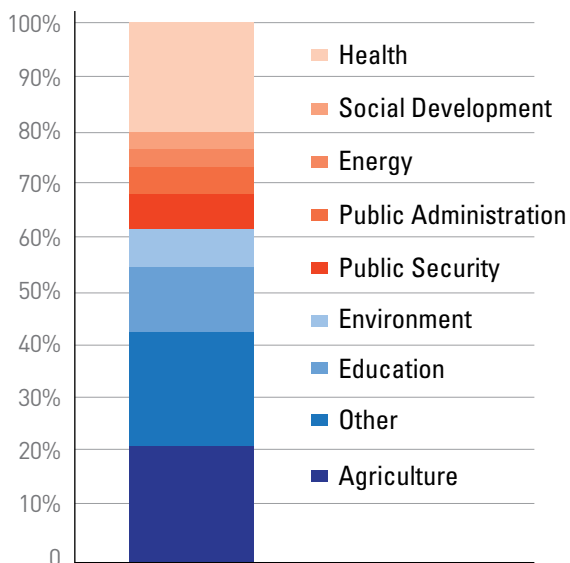
Brazil's initial cooperation efforts date back to the 1950s. During that decade, the country started to establish links with Africa and Latin America through a limited number of initiatives and technical assistance programs, bolstering its influence in those regions. In 1960, Brazil established a national system for international cooperation to better integrate the assistance it both received and provided into its national development agenda. In 1987, the government established the Brazilian Agency for Cooperation (ABC), housed within the Ministry of Foreign Affairs, in order to formalize alignment of the country's foreign policy priorities and technical cooperation activities.²² As the official coordinating body for Brazilian international cooperation, ABC's mandate is to articulate the activities undertaken by different government sectors in the context of Brazil's foreign affairs.²³

Despite this, Brazil's institutional framework for international cooperation is relatively ad hoc and requires improved coordination. Because it is guided by the Ministry's broader foreign policy agenda and relatively restricted budget, ABC's

ability to facilitate funding and relationships with partner countries is somewhat limited.²⁴ This means that, increasingly, a broader group of government agencies and institutions directly finance and implement Brazil's international cooperation programs.²⁵ While this allows for some flexibility around the formation and structure of partnerships, programs still tend to coincide with the country's foreign policy.

In approach, Brazil's international cooperation agenda aligns with the country's longstanding stated commitment to South-South cooperation, mutual benefit and shared experiences among developing countries. Brazil's policy is to provide "demand-driven" assistance, tailored to the needs and contexts of recipients, often as a response to a request for assistance. The country also draws upon best practices from domestic initiatives and seeks to export models and experiences that have proven successful at home.²⁶ Brazil's government openly rejects the top-down, donor-driven assistance models that it associates with traditional donors, as well as the definitions

2.2 BRAZIL INTERNATIONAL COOPERATION* BY SECTOR, 2005-2009 (%)

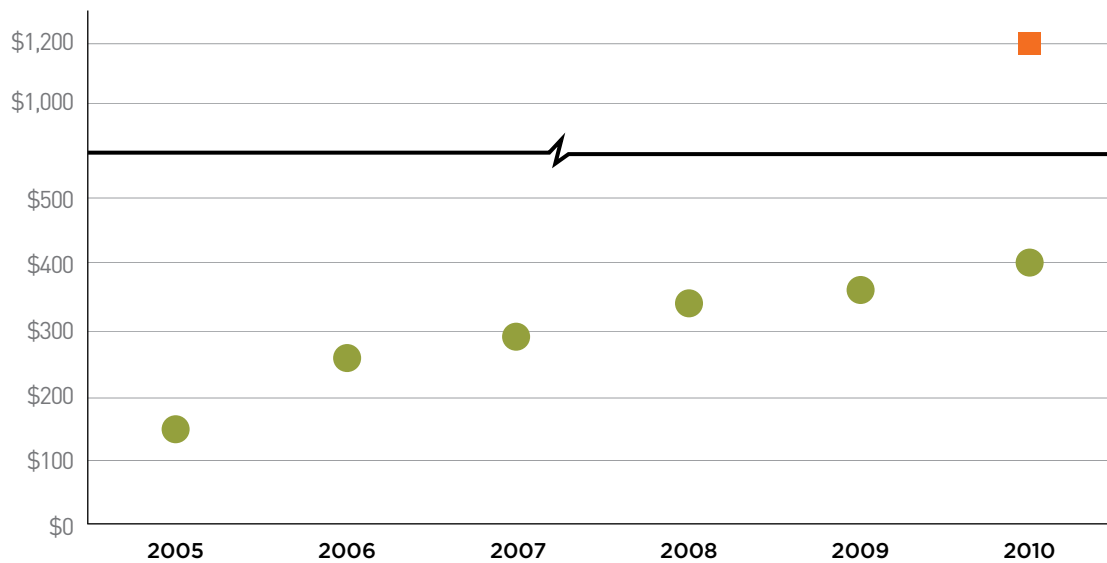


Source: Brazilian Technical Cooperation for Development, Overseas Development Institute, 2010

Note: *Breakdown as outlined by ABC

2.3

ESTIMATED BRAZIL FUNDING FOR INTERNATIONAL DEVELOPMENT COOPERATION (USD Millions)



Source: Institute of Applied Economic Research (IPEA) Report, 2011; *Inter-Press Service*, "Brazil, Emerging South-South Donor"; *The Economist*, "Speak Softly and Carry a Blank Cheque"; World Bank Dataset; GHSi Analysis

Note: The IPEA report provides analysis of the cooperation activities of 65 federal government ministries and related entities involved in Brazil's development cooperation; USD:BRL currency conversions based on IMF annual average exchange rates

■ High Estimate
● Low Estimate

used by the OECD. That said, Brazil's approach to international cooperation values good governance and respect for human rights.^{27,28}

Brazil's top international cooperation priorities include agriculture, education and health,²⁹ and the country emphasizes technical support — specifically capacity building, knowledge transfer and infrastructure development (Figure 2.2). Brazil also favors trilateral cooperation, setting it apart from the other BRICS, which generally prefer to supply assistance through bilateral or multilateral channels. Under this approach, Brazil partners with a developed country or multilateral agency on a program in a developing country, leveraging the partner's expertise and financial capital to enhance program outcomes.³⁰ This triangulation also creates cost-sharing mechanisms that allow cooperation programs to bypass federal laws that restrict how public resources can be spent. For instance, the transfer of financial aid abroad is prohibited.³¹

CURRENT INTERNATIONAL COOPERATION PROGRAM

Today, Brazil is both a recipient of foreign assistance and a donor. However, the foreign assistance it receives has steadily decreased over the last decade. In 2009, the country received US\$338 million in assistance.³² In 2010 Brazil gave an estimated total of between US\$400 million and US\$1.2 billion. (Figure 2.3). Anecdotal evidence suggests that the actual figure is closer to the high estimate. However, the range of estimates is quite large because Brazil does not report to the OECD Development Assistance Committee (DAC) and available government data does not comprehensively track aid flows across agencies.³³

Brazil's international cooperation program currently prioritizes Lusophone countries — Angola, Cape Verde, East Timor, Guinea-Bissau, Mozambique and São Tomé and Príncipe — and countries in Latin America and the Caribbean

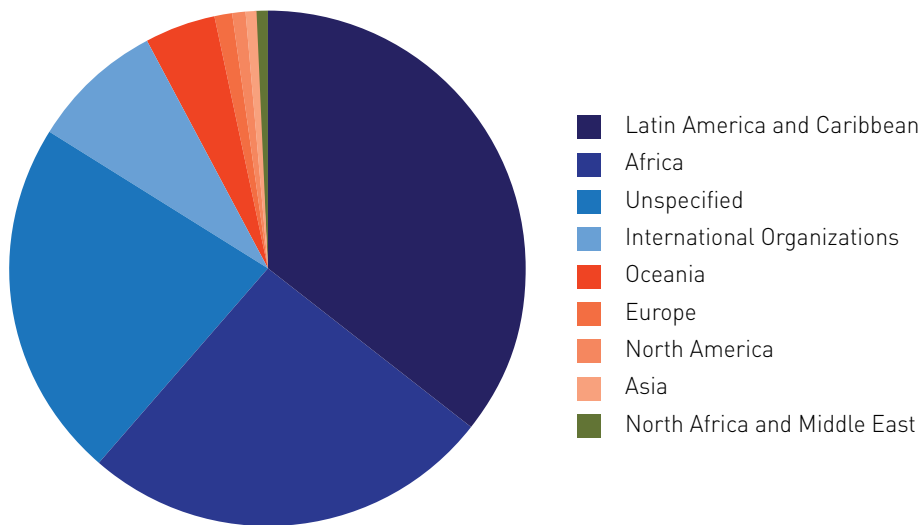
region (Figure 2.4). In 2009, 50% of ABC's budget went to programs in Africa and 23% went to development efforts in South America. Mozambique, East Timor, Guinea-Bissau and Haiti are the largest recipients.³⁴ Haiti remains a top priority. Brazil leads the UN Stabilization Mission in Haiti and it increased its financial contributions to the country — totaling US\$350 million to date — in the aftermath of the January 2010 earthquake.³⁵

Brazil is one of the few assistance providers unscathed by the recent global financial crisis, and its profile and commitments to foreign assistance are likely to continue increasing. ABC's spending has tripled since 2008.³⁶

Brazil's Health Cooperation

Funding for global health efforts comprises one-sixth of Brazil's total international cooperation outlays.³⁷ As in the country's broader assistance program, most of its health activities take the form of technical assistance and focus on Lusophone countries, South America and the Caribbean. These programs are funded and managed through a combination of bilateral and multilateral channels, although Brazil also increasingly engages in trilateral health cooperation. While Brazil is expanding its support for health in poorer countries, its greatest contributions to global health are arguably its leadership on policy and access issues affecting the Global South.

2.4 BRAZIL TECHNICAL COOPERATION BY REGION, 2005-2009 (%)



Source: Institute of Applied Economic Research (IPEA) Report, 2011

Note: Technical cooperation represents one piece of total Brazilian cooperation outlined in the IPEA report; USD:BRL currency conversions based on IMF annual average exchange rates

TRENDS IN HEALTH COOPERATION

Health is currently one of Brazil's top-three focus areas for international cooperation.³⁸ Approximately 35% of ABC's cooperation activities are health-related, and this represents only a portion of Brazil's overall commitments, which are spread across multiple government agencies.³⁹

Health has been a pillar of Brazil's international cooperation program since the program's inception in the 1960s.⁴⁰ Much of this focus stems from the country's domestic commitment to improving health equity and access. Brazil's 1988 Federal Constitution established the right of all citizens to health and government-provided health services. This right was formalized with the creation of the SUS, Brazil's universal health care system. The SUS is built upon a core philosophy of availability and access, and while quality of care continues to vary widely across regions and types of services, other developing countries see Brazil's domestic health achievements as a model for success in resource-limited settings.⁴¹ SUS employees are used to working in challenging environments and are thus valuable sources of knowledge in technical cooperation initiatives with developing countries.

Brazil's focus on health extends to its overall foreign policy agenda. The country's health cooperation strategy is supported by both the Ministry of Health and the Ministry of Foreign Affairs. This arrangement has enabled health to be integrated into Brazil's broader foreign policy objectives and programs with an emphasis on horizontal partnerships, local capacity building through human capital and infrastructure development, and regional coordination.⁴² In 2006, Brazilian policymakers took this model to the UN, where they spearheaded efforts to make health an official cornerstone of foreign policy for all countries. This resulted in the 2007 Oslo Ministerial Declaration, signed by the Ministers of Foreign Affairs of Brazil, France, Indonesia, Norway, Senegal, South Africa and Thailand. The declaration calls on governments to fully integrate global health into their foreign policies and to recognize the fundamental role of health in international relations.⁴³

At the time of Brazil's commitment to universal access to ARVs, many global policymakers doubted its feasibility in a developing country with limited resources. Yet Brazil's success upended this conventional wisdom.

HEALTH COOPERATION PRIORITIES

Brazil's health cooperation priorities are determined by its overall foreign policy priorities, health-specific expertise and the needs of partnering countries.^{44,45,46,47} Programs predominantly focus on HIV/AIDS, nutrition, access to medicines and capacity building — all areas of perceived strength — with funding channeled through a combination of bilateral, multilateral and trilateral mechanisms.

HIV/AIDS AND ACCESS TO MEDICINES

Health cooperation around the prevention and treatment of HIV/AIDS — and access to medicines more broadly — builds on Brazil's successes in tackling its own HIV epidemic. In 1996, under pressure from domestic AIDS activists, the Brazilian government guaranteed universal access to state-of-the-art ARV treatment for all citizens with HIV.⁴⁸ To achieve this goal, Brazil promoted the local production of generic ARV drugs and importation of brand-name ARVs and increased pressure on pharmaceuticals and Western countries to lower the cost of existing HIV/AIDS medicines. Combined with aggressive HIV prevention programming, this cut Brazil's AIDS mortality in half between 1996 and 2002.⁴⁹

At the time of Brazil's commitment, many global policymakers doubted the feasibility of providing universal access to ARV treatment in a developing country with limited resources.⁵⁰ Yet Brazil's success upended this conventional wisdom, and the program has become a source of great pride. As a result, other developing countries have sought Brazil's cooperation and counsel on their own HIV/AIDS and ARV policies.

International Cooperation Program: In 2002, Brazil formed bilateral partnerships with Bolivia, Paraguay and other developing countries to

donate treatments and transfer technologies and best practices for national HIV/AIDS and “access to ARV” programs. The second phase of the program — supported by UNAIDS and UNICEF — began in 2005 and focused on Bolivia, Paraguay, Nicaragua, Guinea-Bissau, Cape Verde, East Timor and São Tomé and Príncipe. These partnerships aim to demonstrate the feasibility and cost-effectiveness of Brazil’s ARV policies in low-income countries.⁵¹

International Centre for Technical Cooperation on HIV/AIDS (ICTC):

In 2005, Brazil and UNAIDS founded ICTC within the Ministry of Health’s STD/AIDS Department in Brasília. Informed by Brazil’s domestic progress against HIV/AIDS, ICTC has served as a South-South technical resource on HIV/AIDS-related issues. As of 2011, ICTC had collaborations with 19 countries in South America, Africa and the Caribbean.⁵² In addition to Brazil, ICTC has received support from European donor agencies and multilaterals.⁵³

Mozambique ARV Factory: Brazil is currently supporting the development of a US\$21 million ARV factory in Mozambique. Once complete, the facility will have the capacity to produce 226 million ARV tablets and 145 million units of other medicines annually for domestic supply and provision to other African countries. The goal is to reduce Mozambique’s donor dependence and to increase health partnership opportunities within Africa. The Oswaldo Cruz Foundation (Fiocruz) is leading the initiative. Several other Brazilian institutions are involved, providing equipment and training staff. Despite the fact that the project timeline has been extended by several years, initial production is expected late in 2012 and full technology transfer is slated for completion by 2014.⁵⁴

NUTRITION

In recent years, Brazil has had great success in reducing domestic poverty rates and child hunger through programs like Bolsa Família and its Network of Human Milk Banks. Many developing countries view Brazil as a global leader in nutrition policy and programming, and Brazil collaborates with several of them to implement local versions of successful initiatives.

Bolsa Família: Bolsa Família is a central component of Brazil’s broader Fome Zero/Zero Hunger federal assistance program. It encourages families to meet specific health and development benchmarks, such as immunizing infants and enrolling children in school, in exchange for cash payments and nutrition subsidies. Since 2005, Brazil’s Ministry of Social Development and Hunger Alleviation (MDS) has implemented 23 Bolsa Família-inspired technical cooperation projects in more than 50 countries, with support from the World Bank, the UK Department for International Development (DFID) and others. In 2008, following successful pilot programs in Ghana, MDS, DFID and the United Nations Development Programme (UNDP) International Poverty Centre launched the Africa-Brazil Cooperation Program on Social Development, with a goal of systematizing Brazil-Africa cooperation around nutrition and social development more broadly.⁵⁵

Brazilian Network of Human Milk Banks: Brazil’s Network of Human Milk Banks is the largest of its kind in the world, with nearly 200 banks collecting 140,000 liters of breast milk per year. The milk banks promote breastfeeding to improve infant nutrition and seek to prevent mother-to-child transmission of HIV.⁵⁶ Brazil began expanding its milk bank network in 2003. In 2005, following the successful replication of Brazil’s model in Venezuela, Uruguay, Argentina, Ecuador and Cuba, Brazil helped establish the Latin American Network of Human Milk Banks.⁵⁷ Fiocruz — a federally funded health research institute — is also overseeing efforts to establish milk banks across the Community of Portuguese Language Countries (CPLP) and in other African countries.⁵⁸ As of 2011, the Brazilian government had signed agreements with Mozambique, Cape Verde and Angola to implement milk banks, provide technical training, and purchase equipment within two years.⁵⁹

CAPACITY BUILDING AND INFRASTRUCTURE DEVELOPMENT

Brazil uses technical health cooperation to build capacity in partner countries, with a stated goal of fostering local ownership, reciprocity and sustainable development.⁶⁰

WTO TRIPS Agreement

The Agreement on Trade Related Aspects of Intellectual Property Rights, or TRIPS, is a 1995 World Trade Organization (WTO) agreement on intellectual property rights that strengthened patent protections in many Member Countries. Among other things, the agreement provided patented pharmaceutical drugs, including HIV/AIDS drugs, with greater protection against generic production. To address the negative effects of TRIPS on access to medicines in developing countries, the WTO issued the Doha Declaration of 2001, emphasizing that TRIPS should be interpreted in light of the importance of access to medicine for all. TRIPS also includes several “flexibilities,” including compulsory licensing, parallel importation, limits on data protection, public health emergencies and other exceptions.

Brazil has been one of the most prominent supporters of the compulsory license flexibility, and the country has successfully invoked the possibility of using it in negotiations to lower the price for patented ARVs. To date, Brazil has issued only one license for an ARV drug. India recently issued its first license for a cancer drug, and Thailand has issued several licenses for ARVs and cancer and heart disease medicines. The pharmaceutical industry has strongly opposed compulsory licensing in middle-income nations, pointing to the high costs of R&D and their discounted prices in developing markets.

Emergency Care Units: Following the January 2010 earthquake in Haiti, Brazil has been working to help rehabilitate the country’s health system through equipment donations, disease surveillance support and professional training for Haitian medical personnel.⁶¹

Integrated Health Care Networks: With support from the German International Cooperation Agency (GIZ), the Brazilian Ministry of Health and ABC are in discussions to help build integrated health care networks similar to the SUS in Paraguay and Uruguay. This effort will be implemented in stages, beginning with pilot projects in each country.⁶²

HEALTH POLICY LEADERSHIP

Brazil has been a vocal advocate for specific global health policies, with significant impact on the health of developing countries and the actions of key international organizations.⁶³ This health diplomacy has been most notable around IP rights and tobacco control.

Intellectual Property Rights: Since the late 1990s, Brazil’s Ministries of Health and Foreign Affairs have defended the country’s aggressive stance on access to medicines — and ARVs in particular — at the WTO and the UN. Brazil has remained an advocate for flexibilities in Trade-

Related Intellectual Property Rights (TRIPS) to facilitate lower-cost production and distribution of essential medicines in developing countries. At the 2004 International AIDS Conference in Bangkok, Brazil worked with other countries to establish the International Technical Cooperation Network, which conducts joint activities to leverage TRIPS flexibilities and the 2001 Doha Declaration. The Network official launched at the 2005 World Health Assembly.^{64,65}

Framework Convention on Tobacco Control

(FCTC): Brazil’s strong domestic tobacco control program has allowed it to assume a global leadership role in this area, and the country played a prominent role in negotiations around the FCTC. WHO recruited the country to spearhead the Tobacco Free Initiative and chair the Intergovernmental Negotiating Body for the agreement. Brazil’s support for the FCTC was critical to its 2005 enactment, because it helped counter industry arguments that tobacco control was largely a “first world issue.”⁶⁶ In December 2011, President Dilma Rousseff signed new tobacco control legislation, increasing taxes on tobacco products and making Brazil the world’s largest smoke-free country. Brazil’s Ministry of Agriculture is providing technical assistance and agricultural extension services to help

farmers who are currently dependent on tobacco sales diversify away from tobacco crops. This comprehensive approach to tobacco control is seen as a model for other countries.⁶⁷

Union of South American Nations (UNASUR)

Pharmaceutical Policies: Brazil and other South American countries are using UNASUR as a platform to collectively negotiate with pharmaceutical companies on fair drug, technology, vaccine and medical equipment pricing.⁶⁸

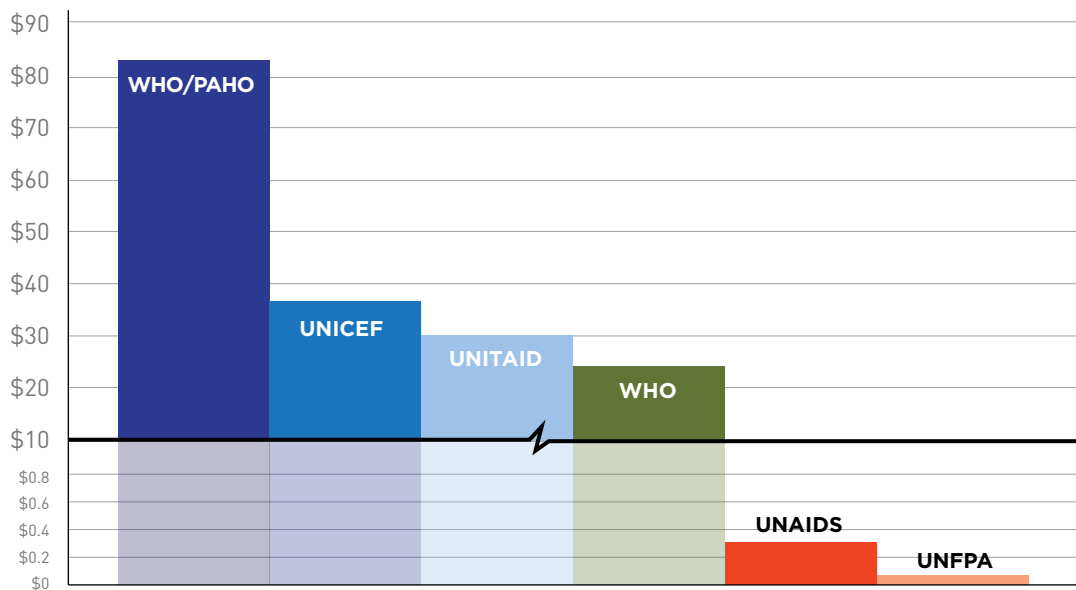
COOPERATION WITH HEALTH MULTILATERALS

Brazil provides financial and technical support to a number of multilateral health organizations. These include the Global Fund, the GAVI Alliance and various UN agencies (Figure 2.5). Of these, Brazil's most significant financial contributions are to WHO and the Pan-American Health Organization (PAHO), WHO's regional branch in

the Americas. Between 2006 and 2009, Brazil gave a combined total of US\$106.5 million to these agencies.⁶⁹ In 2006, Brazil pledged US\$20 million over 20 years to the International Finance Facility for Immunisation (IFFIm), one of the GAVI Alliance's funding mechanisms, indicating global immunizations is a priority issue.

Brazil's most prominent multilateral effort is UNITAID, launched in 2006 by the governments of Brazil, France, Chile, Norway and the UK. UNITAID leverages an innovative funding mechanism based on airline fees and other donor support to facilitate sustained, global access to essential medicines. Brazil has contributed US\$10 million to UNITAID annually since 2007. UNITAID uses its resources to build and shape markets for health commodities, helping to reduce the cost of medicines for priority diseases — namely TB, HIV/AIDS and malaria — and increase the supply of drugs and diagnostics for low- and middle-income countries.⁷⁰

2.5 BRAZIL CONTRIBUTIONS TO KEY HEALTH MULTILATERALS, 2006-2009 (USD Millions)



Source: Institute of Applied Economic Research (IPEA) Report, 2011; UNICEF; UNITAID; UNAIDS; the GAVI Alliance

Note: Brazil pledged US\$20 million over 20 years to the GAVI Alliance in 2006 and was approved in 2011 to begin contributions; USD:BRL currency conversions based on IMF annual average exchange rates

In 2011, the Brazilian government declined a second phase grant from the Global Fund Malaria Project on the grounds that it could independently finance the project activities. The government recommended that the Global Fund use funds earmarked for Brazil to help other developing countries with greater health and development needs.

Brazilian Innovation and Implications for Global Health

In recent years, the Brazilian government has taken significant steps to build the country's biotechnology sector and develop its faculty for health innovation. Currently the public sector, including academic and government-sponsored institutions, is responsible for the majority of Brazil's health research.⁷¹ While the private sector has traditionally been weak in this area, policymakers have come to recognize key shortcomings in Brazil's capacity to translate domestic research into new health products. As a result, they are increasingly looking to the private sector as a key partner in strengthening the country's product development pipeline.⁷² The majority of Brazil's present R&D is aimed at domestic health priorities.⁷³ However, many of these issues are also critical global health challenges. As Brazil's competencies in health research and innovation grow, its products and expertise may play a greater global role.

KEY TRENDS IN HEALTH INNOVATION

Much like the other BRICS, Brazil has scaled up investments in and capacity for public, private and academic R&D in an effort to transition from manufacturer to innovator. Historically, much of Brazil's health manufacturing focused on production of key supplies for the health system. Today, Brazil's R&D pipeline is more robust and includes vaccines, diagnostics and reagents, drugs and therapeutics. While many

of these products are still in the early stages of development and primarily target the domestic market, they could have implications for the global health market in the near future.

Brazil's total public investment in science and technology has been steadily increasing, growing from approximately US\$3.6 billion in 2000 to US\$12.8 billion in 2010 — an annual growth rate of 13.5%.⁷⁴ Innovation is a priority for President Dilma Rousseff, who launched an economic stimulus package in 2011 to expand government support and incentives for R&D.^{75,76} The Brazilian Development Bank's (BNDES) Profarma innovation program is a key model, providing preferential financing conditions to public and private companies that invest in R&D capacity for the health sector.⁷⁷

These broad investments in the country's R&D capacity have enabled increased support for specific programs that align with global health priorities. As an example, Brazil was the 4th largest funder of neglected disease research in 2008, with an investment that year of US\$36.8 million.⁷⁸

PUBLIC SECTOR INVESTMENT IN HEALTH RESEARCH

At the federal level, Brazil's public research financing is channeled through a number of agencies that support both the public and private sectors. In addition to BNDES, which funds the private sector and major infrastructure projects, some select agencies include:

The National Council of Scientific and Technological Development, and the Brazilian Innovation Agency for Research and Projects Funding (FINEP), both of which are linked to the Ministry of Science, Technology and Innovation.⁷⁹

The National Council of Scientific and Technological Development supports research programs through theme-specific requests for proposals.⁸⁰

The Coordination for the Improvement of Higher Education Personnel, an agency within the Ministry of Education, funds academic

research through scholarships and fellowships and provides support to senior scientists and international research programs.⁸¹

The Department of Science and Technology (DECIT) invests in ministry priorities for health innovation and also helps coordinate innovation funding from other federal and state agencies that targets Brazil's health goals.⁸²

The Ministry of Health's Secretariat for Science and Technology and Strategic Supplies (SCTIE), which is home to DECIT, is increasingly focused on priorities that could support both national and global needs, in alignment with Brazil's international cooperation efforts. In addition to its research investment, SCTIE also provides direct funding to increase R&D capacity of manufacturers that provide diagnostics, drugs and vaccines to the SUS.^{83,84}

At the state level, government-funded Research Funding Foundations (FAPs) provide direct support to local research organizations, focusing on the strengths and priorities of each state.⁸⁵ Virtually all Brazilian states have FAPs, whose budgets are usually proportional to state tax revenue. Together, the FAPs provide approximately US\$1 billion in total funding per year, although the state of São Paulo fronts close to 40% of this.⁸⁶

Both Brazil's federal and state agencies have increased their investments over the past eight years. DECIT's budget alone has grown from approximately US\$2.78 million when it was founded in 2000 to around US\$40 million in 2009.⁸⁷ DECIT has also played a catalytic role among federal and state funders by leading the development of national health research strategies that have been endorsed by other funding agencies. Public health research funding

Brazil's large, government-linked health nonprofit manufacturers — which focus on both R&D and the production of health products for the SUS — are unique among the BRICS.

in Brazil totaled approximately US\$750 million between 2002 and 2010, with 68% coming from agencies outside of the Ministry of Health.⁸⁸

THE ROLE OF THE PRIVATE SECTOR

Brazil's private sector has traditionally relied on partnerships with public institutions to access technical know-how and research expertise.⁸⁹ However, Brazil's government is implementing a range of measures to further strengthen the country's innovation infrastructure. These efforts are directed at both the public and private sectors, and include laws passed in 2005 and 2006 that formally foster cross-sector relationships and facilitate the sharing of intellectual property and resources.⁹⁰

Currently, the private sector's role in Brazilian health innovation is small. However, as a result of government and private investment, its ability to contribute to health R&D and product development is increasing. BNDES and FINEP have provided significant direct financial support to private biotechnology and pharmaceutical companies, which are building in-house programs and partnerships.⁹¹ In addition, the growth of Brazil's generics market over the last decade has provided companies with enough revenue to start establishing R&D portfolios. Between 2000 and 2009, the country's domestic pharmaceutical market grew substantially, to approximately US\$16 billion per year. This makes Brazil Latin America's leading pharmaceutical market and has helped attract other sources of investment that are further building the private sector's capacity for production and innovation.⁹²

HEALTH INNOVATION AND GLOBAL HEALTH CASE STUDIES

BRAZIL'S PUBLIC SECTOR MANUFACTURERS

Brazil's large, government-linked health nonprofit manufacturers — which focus on both R&D and the production of health products for the SUS — are unique among the BRICS.⁹³ These public manufacturers provide the majority of affordable vaccines, drugs and diagnostics used by the Brazilian government and are a key component of the country's health innovation system.

The Brazilian government founded Fiocruz, based in Rio de Janeiro, in 1900 to oversee the country's campaign against bubonic plague... Today the institution is a national and regional leader in health R&D; production of vaccines, reagents, drugs and diagnostics; human resource training; information sharing; quality control; and implementation of social programs.

In the specific case of vaccines, two institutions alone — Fiocruz's Bio-Manguinhos and Butantan — comprise 89% of all vaccine sales to the Brazilian Ministry of Health and supply almost 100% of the routine vaccines covered by the National Immunization Program.⁹⁴ They are supported by public investment and work in close coordination with the Ministry of Health. Both are currently investing in enhanced production capacity, and their goals include potentially playing a larger international role in supplying affordable vaccines.

Fiocruz: The Brazilian government founded Fiocruz, based in Rio de Janeiro, in 1900 to oversee the country's campaign against bubonic plague.⁹⁵ Since then, Fiocruz's work — distributed across multiple units with specific expertise — has expanded dramatically. Today the institution is a national and regional leader in health R&D; production of vaccines, reagents, drugs and diagnostics; human resource training; information sharing; quality control; and implementation of social programs.⁹⁶ Fiocruz prioritizes technology transfers to increase its in-house research and manufacturing capacity. These include partnerships with the private sector to strengthen its vaccine manufacturing capacity, such as one established in 1985 with the multinational pharmaceutical company GlaxoSmithKline.⁹⁷

Fiocruz works closely with the Ministry of Health and ABC to execute regional and international cooperation activities. Much of this work leverages Fiocruz's technical expertise to help other governments strengthen health

infrastructure, including labs, schools of public health and research institutes. For example, Fiocruz's international office in Maputo, Mozambique, is responsible for implementing the ARV manufacturing project, as well as cooperation activities in other African countries.⁹⁸

Bio-Manguinhos — Fiocruz's Immunobiological Technology Institute — is Latin America's leading producer of vaccines and diagnostics for infectious and parasitic diseases. It is capable of producing 200 million doses of vaccines per year, including immunizations against measles, polio, diphtheria, tetanus, MMR and yellow fever. It is the world's largest producer of yellow fever vaccine. Bio-Manguinhos also develops and manufactures diagnostic kits for HIV/AIDS, Chagas and leishmaniasis, among others. While these products primarily support the domestic market, it also supplies products directly to PAHO and UNICEF for distribution to other countries. Bio-Manguinhos' yellow fever vaccine and polysaccharide meningococcal A and C vaccines have WHO prequalification and have been exported to more than 60 countries.^{99,100}

In addition, Fiocruz recently launched the Center for Technological Development in Health (CTDS), which aims to mobilize public sector resources for research while capitalizing on the private sector's comparative advantage in product development. CTDS was founded in response to acknowledged gaps in translational activities that link Brazilian health innovation to product development.¹⁰¹ CTDS also has a number of notable partnerships with international organizations, including a 2007 agreement with the private biotechnology company Genzyme to facilitate drug R&D for 17 neglected diseases and collaborations with the Drugs for Neglected Diseases initiative and Medicines for Malaria Venture.¹⁰²

Butantan: Butantan, affiliated with the Secretariat of Health of the State of São Paulo, is another prominent public health research and manufacturing institution. Established as the Federal Seropathy Institute in the early 1900s, its original mandate — like Fiocruz's — was to help lead Brazil's fight against bubonic plague. Butantan began producing vaccines in the 1940s


and is now a domestic leader in vaccine innovation and production. Its current portfolio of vaccines includes diphtheria-pertussis-tetanus (DPT), influenza, hepatitis B, and a neonatal immunization to protect newborns against tuberculosis (TB). It conducts basic and applied biomedical research in other fields including molecular biology, immunology and epidemiology.¹⁰³

While Butantan's main focus is access to medicines domestically, it is also involved in research that has global implications. Butantan is developing a low-cost rotavirus vaccine in partnership with the US NIH and Pfizer. The vaccine is currently in clinical trials but if successful it is expected to cost between US\$1 and US\$2 per dose, as compared to the current GAVI Alliance price of US\$2.50 per dose. Butantan is also working on vaccines against pneumonia and dengue.¹⁰⁴

PUBLIC-PRIVATE PARTNERSHIPS

Benznidazole: In December 2011, although the domestic burden of Chagas disease is declining,

the Brazilian government announced a renewed commitment to produce benznidazole — an antiparasitic medication — and provide it to other countries where Chagas remains endemic. Brazil has been producing benznidazole since 2008, but global supplies of the active pharmaceutical ingredient have fallen and existing stocks have been depleted.¹⁰⁵

The announcement, championed by the Brazilian Ministry of Health, will make Brazil the world's sole producer of benznidazole going forward. Nortec Química, a private company based in Rio de Janeiro, will produce the active pharmaceutical ingredient in benznidazole through a tech transfer from Roche. Laboratório Farmacêutico do Estado de Pernambuco (LAFEPE), a public drug manufacturer in the state of Pernambuco, will then manufacture the drug to supply global markets. Brazil aims to produce 3.2 million benznidazole pills per year. Médecins Sans Frontières and PAHO will help distribute the drug in endemic countries such as Bolivia and Paraguay.¹⁰⁶ 



3 RUSSIA

Russia is unique among the BRICS in that it is re-ascending, rather than ascending, to the status of global economic and political power. As a successor state of the former Soviet Union, Russia was once one of the most powerful nations in the world. While it faced significant economic challenges — including a 40% GDP contraction and the rise of corruption and oligarchy — following the Soviet Union’s collapse, it has rebounded to what the World Bank calls “unprecedented macroeconomic stability.”¹ Russia has been the only BRICS member of the G8 since 1997, at the same time building partnerships with the emerging economies. It is also increasingly protective of its traditional sphere of influence in Eurasia. Russia’s long-term growth, however, is threatened by structural issues, and recent demonstrations have highlighted its political challenges and impacted its reputation for stability.

ECONOMIC LANDSCAPE

Russia currently has the 11th largest economy by nominal GDP, and it holds the fifth largest foreign exchange reserves. While the move from planned to market economy plunged Russia into chaos in the 1990s, it has enjoyed economic growth averaging 5% annually from 1998 to 2010.^{2,3} GDP per capita (PPP) has increased nearly three-fold since 2000 to US\$19,800 in 2010, and a large portion of Russia’s population is now middle class.^{4,5}

Russia is home to the world’s largest mineral and energy reserves, and these commodities largely drive its economy. The country has consistently been one of the biggest oil and gas exporters, and political unrest in North Africa and the Middle East, combined with a move away from nuclear power following the Japan Fukushima disaster,

have only increased its output. In 2011, oil exports returned for the first time to Soviet Union levels.⁶ Russia is also a significant exporter of steel and primary aluminum. While commodities have fueled Russia’s economic success, they are also vulnerable to global boom and bust cycles. As a result, since 2007, Moscow has been working to diversify into high-tech sectors.⁷

While Russia’s economy is growing faster than most of its Western European and G8 counterparts, it still faces serious challenges. Russia was among the countries hardest hit by the global financial crisis, and while it is steadily recovering — growth in 2010 was 4% (down from 8.5% in 2007) and is expected to stabilize in this range — it still needs to manage the budget deficit it built up during that period.⁸ Rebounding oil prices have helped, but inflation, high expenditures and volatile

commodity markets continue to pose problems. Unlike the other BRICS, Russia is struggling to manage a shrinking population. However, like its counterparts, it must also overcome economic and political corruption, increasing disparity between rich and poor, and the need to raise capital for non-energy sectors.⁹

DOMESTIC POLITICS AND FOREIGN AFFAIRS

In March 2012, Vladimir Putin was elected President of Russia for a third time after term limits required him to step down in 2008. Putin's re-election was expected, but opposition groups have staged a series of protests in recent months demanding political reform. It is still unclear how this will impact domestic politics moving forward.

Russia's geopolitical influence has fluctuated in parallel with its economy and post-Soviet recovery. In 1997, Russia was invited to join the G7 — transforming it into the G8. It is also an influential member of the G20, was confirmed as a member of the WTO in December 2011, and is in the process of joining the OECD. Russia also assumed the Soviet Union's place as one of the five permanent members of the UN Security Council. Russian foreign policy is currently driven by a desire to be viewed as one of the non-Western powers of the world.¹⁰

In recent years, Russia has had mixed but generally cordial relationships with the US, the EU and its immediate neighbors — although tensions sometimes flare. This has been evident in recent disagreements over the response to revolutions in the Middle East and North Africa and with Russia's war with Georgia in 2008. While they do not always align politically, the EU is currently Russia's largest trade partner. Russia also plays a key role in regional fora, including the Commonwealth of Independent States (CIS) and the Eurasian Economic Community (EurAsEC).

Russia also enjoys a friendly rapport with the other BRICS. It has a longstanding relationship with India dating back to the Soviet Union, and it has actively engaged China since the 1990s. Russia and China enacted border demarcations in 1991 and signed the Treaty of Good-Neighborliness

and Friendly Cooperation in 2001, which outlined a 20-year strategic vision for their relationship. At present, they are actively working to increase their economic ties.¹¹

DOMESTIC HEALTH LANDSCAPE

Russia's health indicators dropped precipitously following the collapse of the Soviet Union, and while the situation has since improved, Russia does not enjoy the same health standards as other countries in the G8. A Russian born today can expect to live 68.6 years, up from 64.4 in 1994. Maternal, under-5 and infant mortality rates have been cut in half since 1990.^{12,13} That said, life expectancy continues to lag behind the US and Western Europe, neighboring Ukraine and Georgia, and Brazil and China. Like most countries, Russia's health issues disproportionately impact the poor.¹⁴

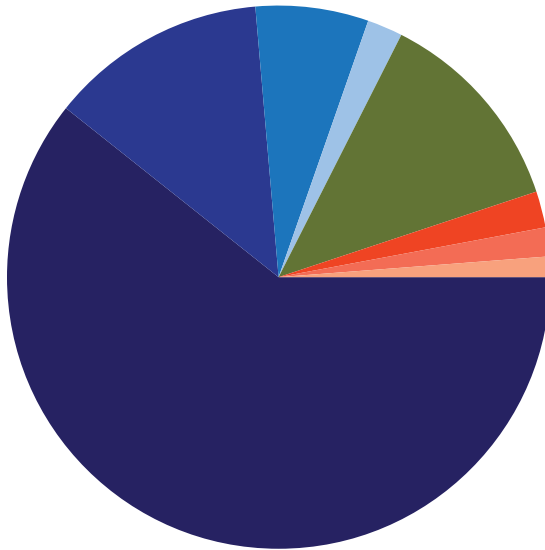
Russia has high burdens of NCDs that far exceed other countries of its economic standing. Cardiovascular disease causes 61% of all deaths within the country, and rates are among the highest in the world (Figure 3.1).¹⁵ This is compounded by high levels of alcohol consumption. While Russia has a relatively small burden of infectious diseases, rates of HIV/AIDS and TB are high among at-risk populations, including intravenous drug users and prisoners.¹⁶ Russia's prisons have become a notorious source of drug-resistant TB.¹⁷

To address infectious diseases, the government committed US\$600 million for HIV/AIDS in 2012, doubling the 2010 budget.¹⁸ However, the program has drawn criticism due to its lack of focus on prevention and unwillingness to fund needle exchange. This is hugely problematic as intravenous drug use is the main mode of HIV transmission in Russia.^{19,20}

The Russian government has taken note of lagging health indicators and is working to reverse these trends. At US\$1,038, Russia currently leads the BRICS in health expenditure per capita — though this still falls short in comparison to the US and Western Europe.²¹ Since 1991, the government has also been attempting to move to a more decentralized

3.1 RUSSIA LEADING CAUSES OF DEATH, 2008

TOTAL: 2.1 MILLION DEATHS



COMMUNICABLE DISEASES AND MATERNAL AND CHILD HEALTH CONDITIONS

- HIV/AIDS
- Other
- TB

NON-COMMUNICABLE DISEASES

- Cardiovascular Diseases
- Cancers
- All Other Non-Communicable Diseases
- Respiratory Diseases

INJURIES

- Injuries

Source: WHO Global Burden of Disease, 2008

health care system. In recent years, the government redoubled efforts to modernize health care in the country.²² In 2005, then-President Vladimir Putin earmarked US\$28 billion through 2013 for the “National Health Care Project,” which focuses on reinvigorating Russia’s health care infrastructure and workforce, particularly in outlying regions. Its ultimate aim is to increase life expectancy.²³ The Pharma 2020 policy was launched in parallel to increase the country’s capacity to domestically produce pharmaceuticals and innovative biotechnology.

Russia’s Foreign Assistance

With the collapse of the Soviet Union, Russia went from being one of the largest sources of international assistance in the world to being a net aid recipient in the 1990s. It became a re-emerging donor in the 2000s. While the country does not publicly report official assistance figures,

Ministry of Finance reports indicate it currently provides an estimated US\$400 to US\$500 million each year to other countries, which is less than Brazil, India and China. The country takes a traditional, vertical approach to assistance and is in the process of joining the OECD. This should lead to more transparent reporting on its assistance program. It also sets Russia apart from other BRICS, which tend to favor horizontal “cooperation” programs.²⁴

TRENDS IN FOREIGN ASSISTANCE

The historical roots of Russia’s international assistance program lie in the Soviet Union. Driven by the Cold War, the Soviet Union launched an economic and technical development program in 1955 that focused on “neutralist” countries — including many in Southeast Asia, South Asia and Africa.

The Soviet Union used economic, military and development aid as a political tool to improve its global standing in developing countries. In 1961, Russia provided about US\$1 billion, and by 1986 that figure had grown to US\$26 billion.²⁵ After the

Soviet Union broke up, there was a sharp reversal. Russia received a total of US\$20.4 billion in aid from Western donors between 1990 and 2004.²⁶

As Russia's economy rebounded, the assistance it received dropped dramatically. Today the country no longer receives any official bilateral assistance, although a few domestic non-governmental organizations (NGOs) still get international funding. Many UN agencies maintain a presence in Moscow and are involved in health policy discussions.²⁷ While Russia had been forgiving Soviet-era debt for Highly Indebted Poor Countries, it truly re-emerged as a donor in 2004 with an eye toward its 2006 G8 presidency.^{28,29}

CURRENT FOREIGN ASSISTANCE PROGRAM

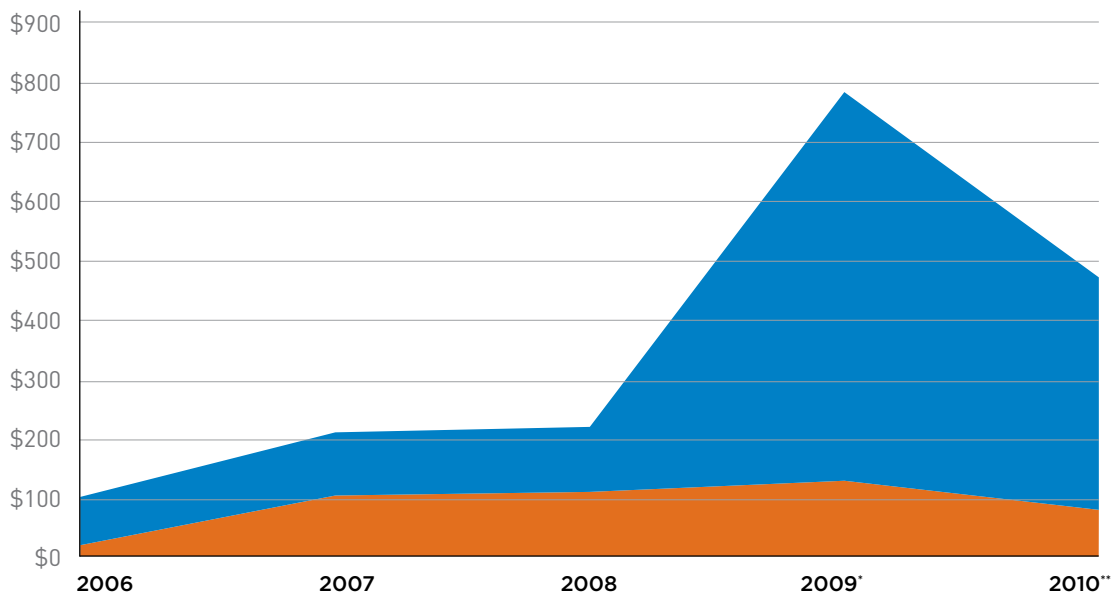
Russia is currently the only G8 country with assistance policies and regulations but no formal definition for official development assistance (ODA). However, the country is aligning itself with

the aid agendas of the OECD-DAC countries.^{30,31} In January 2007, Russia released an International Development Assistance (IDA) Concept Note that laid out the factors driving its growing program. These include maintaining an agreeable global environment for itself and ensuring stability in neighboring states, with global poverty reduction as the cornerstone for its efforts.

With these IDA goals in mind, a large portion of Russia's foreign assistance goes to its neighbors. Priorities include education and infectious disease control.³² Russia is also increasingly providing assistance to countries in other regions — most notably Africa — but it has yet to lay out a formal engagement strategy.³³

When the Russian government launched its current assistance program in 2004, it pledged to contribute US\$400 to US\$500 million per year. Thus far, it appears to have met this commitment. Russia actually exceeded its goal in 2009, when it provided approximately US\$785 million in

3.2 RUSSIA TOTAL INTERNATIONAL AND HEALTH ASSISTANCE (USD Millions)



Source: Deauville Accountability Report, G8 Commitments on Health and Food Security, Ministry of Finance of Russia, 2011

Note: *Marked increase in 2009 a result of emergency funds to stabilize Kyrgyzstan during the global financial crisis

**2010 health figures designated "preliminary" by Ministry of Finance

■ All Other Sector Assistance
■ Health Assistance

Russia is currently the only G8 country with assistance policies and regulations but no formal definition for official development assistance. However, the country is aligning itself with the aid agendas of the OECD-DAC countries.

aid. This was driven by emergency economic support for Kyrgyzstan in the wake of the global financial crisis (Figure 3.2). Russia has pledged to eventually contribute the UN-recommended 0.7% of GNI in international assistance.^{34,35}

Like several other BRICS, Russia does not have a central aid agency. Instead, all assistance programs are overseen by a group of government bodies, including the Ministry of Finance, the Ministry of Foreign Affairs and the Ministry for Affairs of Civil Defence, Emergencies and Disasters Relief.^{36,37} As a result, program management is often ad hoc. The Russian government is working to improve its internal capacity, and ministries are working closely with the World Bank and UN to develop a more formal assistance architecture. The government was expected to launch a central agency for bilateral foreign assistance — RUSAID — in June 2012, but talks are currently on hold.^{38,39}

In the meantime, the Russian government prefers to provide assistance through multilateral aid channels. Policymakers believe that multilateral agencies provide financial controls, established delivery mechanisms, and opportunities for coordination and harmonization, as well as technical support. Key partner organizations include UN funds and agencies, financing mechanisms like the Global Fund, G8 international initiatives, the World Bank and the International Monetary Fund. Russia also maintains some trilateral partnerships with multilateral agencies, but direct bilateral activities are currently limited.^{40,41}

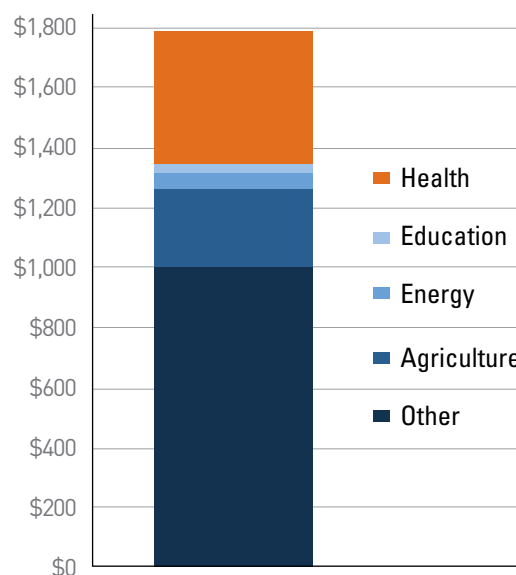
Russia's Health Assistance

Between 2006 and 2010, Russia contributed a total of US\$444 million — or one-fourth of its total international assistance funding — to health (Figure 3.3).⁴² Historically, the majority of Russia's health assistance has been channeled through multilateral institutions. This still holds true, although the percentage is declining. Russia's support for global health multilaterals including the Global Fund, the GAVI Alliance, the Global Polio Eradication Initiative (GPEI) and many UN health agencies is significantly greater than many of its BRICS counterparts.

MAJOR TRENDS IN HEALTH ASSISTANCE

Russia's focus on health assistance began with the re-emergence of its foreign assistance program in the early 2000s and is grounded in the country's Soviet-era successes combating communicable diseases.⁴³ Since 2007, Russia's

3.3 RUSSIA INTERNATIONAL ASSISTANCE BY SECTOR, 2006-2010 (USD Millions)



Source: ODA, Forming a New Collaboration Paradigm, M. Larionova

Russia's support for global health multilaterals including the Global Fund, the GAVI Alliance, GPEI and many UN agencies is significantly greater than the majority of its BRICS counterparts.

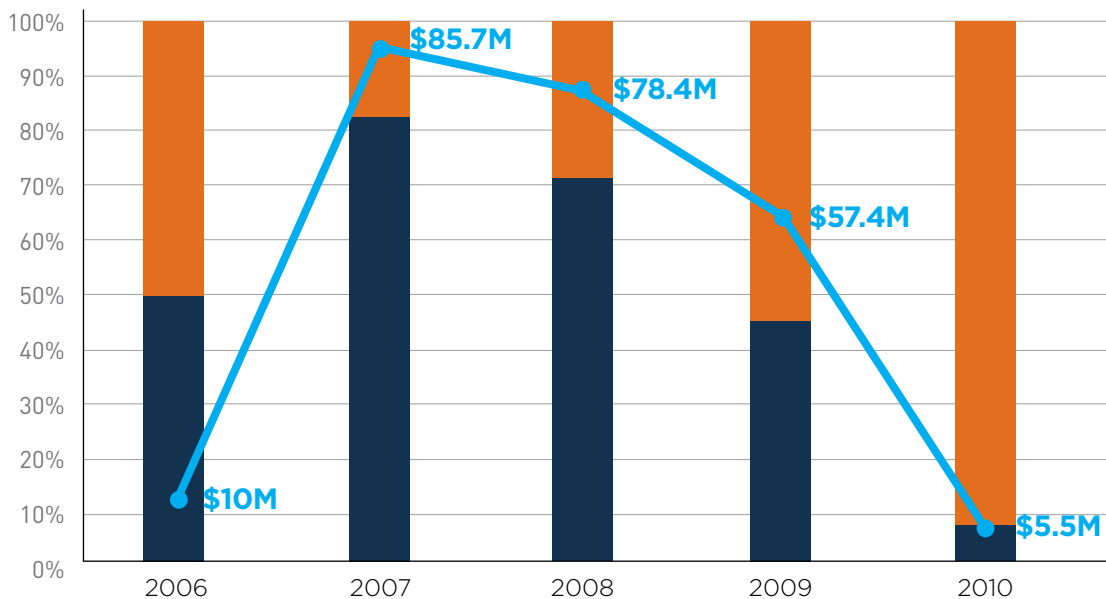
While Russia funnels a large majority of health assistance through multilateral institutions, it increasingly engages in trilateral partnerships with multilaterals and developing countries. It also provides limited bilateral health assistance, particularly within the CIS region.

total assistance funding has fluctuated because of the global financial crisis and, as a result, health assistance has constituted anywhere from 15% to 50% of spending. However, in absolute terms, health assistance funding has remained relatively consistent at between US\$80 and US\$130 million annually (Figure 3.2).⁴⁴ Russia's total assistance budget is expected to stabilize over the next few years at around US\$400 to US\$500 million per year, and health assistance will likely remain a key component of the country's international efforts.

In 2006, Russia put infectious diseases on the agenda for the G8 meeting in St. Petersburg. Since then, its bilateral programs have generally focused on infectious diseases and disease surveillance. The Russian government is also starting to take a more visible role in global efforts to address NCDs. Russia hosted the First Global Ministerial Conference on Healthy Lifestyles and NCDs in April 2011, and both Prime Minister Vladimir Putin and WHO Director-General Margaret Chan attended. In addition, Russia has committed US\$36 million to support the global NCD response.⁴⁶ While NCDs are a domestic health priority, it is unclear whether the country will be able to play a viable global leadership role in this area, given its own high burden.⁴⁷

Russia's health assistance policies are relatively opaque, and many key decisions are likely made at the highest levels of government.⁴⁵

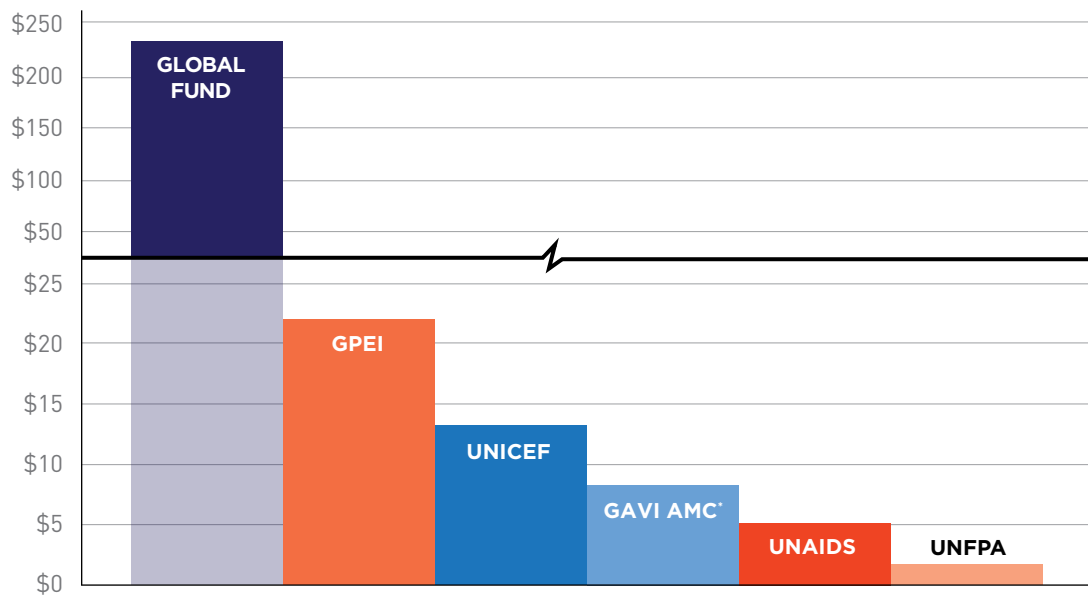
3.4 RUSSIA GLOBAL FUND ASSISTANCE AS PART OF ALL OTHER HEALTH ASSISTANCE (% , USD Millions)



Source: Global Fund; Deauville Accountability Report, G8 Commitments on Health and Food Security, Ministry of Finance of Russia, 2011

■ % Assistance to Global Fund
 ■ % All Other Health Assistance
 ■ Assistance to Global Fund, in USD Millions

3.5 RUSSIA CONTRIBUTIONS TO KEY HEALTH MULTILATERALS, 2006-2010 (USD Millions)



Source: Global Fund; GPEI; the GAVI Alliance; UNICEF; UNAIDS; UNFPA
Note: *Russia's assistance to GAVI AMC only began in 2010 and by 2012 had reached US\$24 million

ASSISTANCE TO HEALTH MULTILATERALS

The Russian government prefers to work within the G8 and UN frameworks for foreign assistance, and this extends to health assistance. From 2006 to 2009, an overwhelming majority of Russia's health assistance was channeled to the Global Fund. In 2006, the country announced it would reimburse the Global Fund for projects in Russia. The Global Fund then received between 44% and 82% of Russia's health assistance funding annually until it became a net donor in 2010 (Figure 3.4). The country has pledged an additional US\$20 million per year for the Fund's Third Replenishment period from 2011 to 2013, which means that the organization will continue to receive a significant portion of Russia's estimated US\$80 to US\$130 million annual health assistance budget. The pledge brings Russia's total commitments to the Global Fund to date to US\$317 million.⁴⁸

Beyond the Global Fund, Russia gives more to most health multilaterals than the other BRICS

but significantly less than many G8 peers (Figure 3.5). Russia is the only BRICS contributor — and one of only six contributors total — to the GAVI Alliance's Advanced Market Commitment (AMC) for pneumococcal vaccines. The country has committed US\$80 million to the AMC from 2010 to 2019, or US\$8 million per year. Russia has also provided small amounts of funding — with totals ranging from US\$1.6 million to US\$13 million from 2006 to 2010 — to UN health organizations, including UNICEF, the United Nations Population Fund (UNFPA) and the Joint United Nations Programme on HIV/AIDS (UNAIDS).

Aside from India, Russia is the only BRICS contributor to the GPEI, having donated a total of US\$33 million between 2003 and 2012. The Russian government views polio eradication in the region as a major priority, and in 2009, the US Department of Health and Human Services and the Russian Ministry of Health and Social Development signed a memorandum of understanding to strengthen collective efforts around polio eradication. This included disease

surveillance, immunization campaigns, technical assistance and advocacy. In 2010, a polio outbreak in neighboring Tajikistan spread to Russia, and the country lost its polio-free WHO certification. As a result, President Dmitry Medvedev called for greater engagement on polio efforts in Russia and Central Asia.

BILATERAL ASSISTANCE FOR HEALTH

Russia provides limited amounts of bilateral health assistance, focusing nearly exclusively on the CIS region. Because Russia does not report all bilateral assistance disbursements, it is difficult to determine year-to-year figures. However, Russia is estimated to have committed a total of at least US\$168 million to bilateral health projects from 2006 to 2013.⁴⁹

Russia's bilateral health assistance has focused primarily on infectious diseases — particularly HIV/AIDS, disease and anti-epidemic surveillance and, to a lesser extent, neglected tropical diseases (NTDs).

INFECTIOUS DISEASES AND HIV/AIDS

The Russian government's focus on HIV/AIDS in the region partly stems from a desire to prevent the disease from spreading across borders into Russia via infected migrant workers and other channels. However, historically, migrant workers in Russia are more likely to contract communicable diseases in the country and carry them home.⁵⁰ HIV/AIDS programs funded through bilateral assistance include vaccine and microbicide research, education, the development of HIV/AIDS country strategies and treatment and screening.^{51,52} The Russian government has also worked to get HIV/AIDS on the agendas of regional intergovernmental organizations, including the Shanghai Cooperation Organization (SCO) and the EurAsEC. While Russia's domestic HIV/AIDS program has been criticized for its promotion of abstinence and lack of harm-reduction programs for the most at-risk populations, it does not appear that these policies have influenced programs it funds through multilaterals or in other countries.⁵³

DISEASE AND ANTI-EPIDEMIC SURVEILLANCE

Russian-funded disease surveillance systems are designed to benefit both recipient countries and Russia itself. Russian assistance generally focuses on strengthening surveillance capacity in neighboring countries and training large teams of specialists on diagnostics and surveillance, particularly for influenza. Disease surveillance programs have received the largest percentage of Russia's bilateral health assistance funding, with total commitments of more than US\$100 million from 2006 to 2010.⁵⁴

NEGLECTED TROPICAL DISEASES (NTDs)

Between 2009 and 2012, Russia contributed at least US\$21 million to NTD control in neighboring CIS states and some African countries. Russian-funded programs have focused on capacity building, training and the development of innovations for the surveillance, diagnosis and prevention of NTDs, including leishmaniasis, schistosomiasis and blinding trachoma. Russia has also worked with CIS and African governments on NTD needs assessments.

TRILATERAL ASSISTANCE FOR HEALTH

Russia has supported some trilateral assistance programs, emphasizing partnerships with global health multilaterals over those with other countries or regional bodies. Russian policymakers believe that partnerships with multilaterals allow Russia to play a more active role in projects, while still aligning with established foreign assistance frameworks. Although annual contributions to trilateral health programs are impossible to quantify, it appears that these programs have focused on malaria control in Africa, and HIV/AIDS and surveillance in CIS countries.

MALARIA

Russia has worked with the World Bank and WHO to support the Bank's Malaria Booster Program and strengthen disease control and prevention in Zambia and Mozambique. Russia is also working with these partners to strengthen human resources and to create a cadre of malaria experts in Africa, the Middle East and the CIS region.

HIV/AIDS AND SURVEILLANCE

Russia has worked with the Global Fund and UNAIDS to co-sponsor three meetings of the Eastern Europe and Central Asia AIDS Conference. The Russian government also signed a memorandum of understanding with WHO to help strengthen surveillance and lab capacity in the CIS and in Africa.

Russian Innovation and Implications for Global Health

Russia's most significant contributions to global health innovation have emerged from its public and academic sectors. Under the Soviet Union, Russia built significant institutional capacity for combating infectious diseases. Today, these institutions are considered a regional resource by many CIS countries. At the same time, Russia's private health care technology sector — including its biopharmaceutical and medical equipment industries — is small. It relies on external markets for raw materials and possesses extremely limited R&D capabilities. To address this, the Russian government recently injected US\$4.4 billion into the sector as part of an ambitious plan to significantly increase domestic capacity for health production and innovation. This plan, known as Pharma 2020, could impact Russia's future contributions in this area.

KEY TRENDS IN HEALTH INNOVATION

The Russian government's health R&D program builds off of work done under the Soviet Union, when publicly funded research focused on infectious diseases and tropical medicine.^{55,56} One of the Soviet Union's best-known contributions in this area is its 1959 role as host of the first clinical trial for oral polio vaccine (OPV). Thousands of Russian children participated, and the Soviet Union subsequently became the first country to develop, produce and use the vaccine for mass immunization.

In 2007, government funding for health R&D was a relatively low US\$300 million, although expenditures are increasing. Following its 2006 G8 presidency, Russia committed to expand its support for HIV/AIDS treatment and prevention research, investing US\$38.2 million in HIV/AIDS vaccine programs.^{57,58}

In addition, Russia's academic institutions are considered valuable "centers for knowledge and science" by CIS countries, which use them for training and scientific information.⁵⁹ Russian medical schools alone provide training to nearly 20,000 foreign students annually, most of whom come from the CIS and Asia.⁶⁰ Neighbors also look to Russian institutions for support on disease surveillance — their help was critical in containing the 2010 polio outbreak in Tajikistan — and as potential partners for research collaborations.⁶¹ Russia's public and academic sectors have the potential to make more substantive contributions on a global scale, but there are significant hurdles, including lack of regulatory and IP policies and language barriers.⁶²

Russia's private health technology sector is small, with limited capacity for innovation. The country's domestic biopharmaceutical and medical equipment industries are worth approximately US\$6.7 billion and US\$900 million annually, respectively, but 70% of their products target the domestic health care system.^{63,64} In 2007, Russian pharmaceutical exports made up less than 0.04% of global sales.⁶⁵ Private companies mostly produce older technologies, such as basic antibiotics and x-ray machines, and have few R&D facilities. There are also relatively few ongoing clinical trials in Russia.^{66,67} As a result, Russia relies on imports for its advanced medical technologies.⁶⁸

Quality control is also a major challenge in the private sector, and only 10% of Russia's 600 pharmaceutical companies follow Good Manufacturing Practice (GMP).⁶⁹ With the implementation of the Pharma 2020 strategy, Russia hopes to significantly strengthen its capacity to produce and export high-quality health-care products.

HEALTH INNOVATION AND GLOBAL HEALTH CASE STUDIES

PHARMA 2020

In March 2011, Prime Minister Vladimir Putin launched the Pharma 2020 strategy, committing more than US\$4.4 billion to build capacity for domestic production and innovation in Russia's pharmaceutical and medical industries.⁷⁰ Multinational pharmaceutical companies are expected to commit an additional US\$1 billion in investments.⁷¹ The Pharma 2020 strategy is meant to complement the Health 2020 initiative, which launched in 2005 with a goal of improving domestic health indicators. However, a central component of Pharma 2020 is to prepare Russia's health care industry for the global market.

Pharma 2020 has three broad goals to be achieved by 2020: 1) Increase local production by 50% to ensure domestic access to drugs — both essential medicines and those that combat rare diseases; 2) Ensure that a majority (60%) of all products produced are innovative and; 3) Reach US\$100 million in exports.

To accomplish these goals, Pharma 2020 directs US\$850 million toward improving human resources and domestic infrastructure, US\$900 million toward ensuring all manufacturers transition to GMP, and US\$2.7 billion toward building R&D capacity for innovative products.⁷² The plan is being implemented in three stages:

Stage 1 (2009-2012): Develop domestic infrastructure for production and R&D. The government is constructing ten major "innovation centers" and pharmaceutical clusters across the country.

Stage 2 (2013-2017): Transition local consumption from internationally to domestically produced generics, with the end goal of making Russia independent of exports.

Stage 3 (2018-2020): Begin developing innovative drugs for patent; expand to global market.

The Pharma 2020 program is supporting development of 57 new drugs to combat a variety of diseases ranging from hepatitis B to multiple sclerosis, which could reach the market in the future.⁷³ In addition, a number of multinational pharmaceutical companies, including AstraZeneca and Novartis, have made significant long-term investments through the program. AstraZeneca is currently constructing the first full-cycle pharmaceutical production facility in Russia.⁷⁴

While the final outcomes of Pharma 2020 remain to be seen, opinions are mixed. Some experts believe that the government is being too ambitious and that it will take even more time and resources to accomplish the plan's goals.⁷⁵ However, greater Russian pharmaceutical manufacturing and innovation capacity could translate into new opportunities to support global health programs. ●



4 INDIA

India has one of the fastest growing economies in the world, and by 2050 it is expected to have the third largest economy — behind only China and the United States. Economic growth combined with a large population and vibrant parliamentary democracy has bolstered India’s political influence both regionally and globally. However, India is still home to large pockets of poverty and significant health challenges. There are also marked economic disparities between different regions as well as urban and rural areas. Corruption and weak infrastructure present additional challenges. The Indian government increasingly recognizes the need to invest heavily in programs and initiatives that it hopes will sustain the country’s rapid upward trajectory and ensure what experts refer to as “inclusive growth.”¹

ECONOMIC LANDSCAPE

India currently has the ninth largest economy by nominal GDP, and GDP growth rates have averaged more than 7% from 1998 to 2010 and 8.5% since 2005 to 2010.² Indian GDP per capita (PPP) more than doubled since 2000 to US\$3,600 in 2010, helping to build a large and growing middle class.³ In addition, the government has recently launched several ambitious programs that aim to lift hundreds of millions more people out of extreme poverty.

India’s economic success is largely due to the economic reforms of the early 1990s, which reduced direct tax rates, increased the role of private sector enterprises, and lightened heavy government restrictions in critical areas like foreign direct investment.⁴ Growth has been sustained by the country’s skilled services industry and 480 million-strong workforce, which is second only to China. Services comprise 55% of the total economy, with industry and agriculture making up 26% and 19%, respectively. While the

country was affected by the global financial crisis, India’s GDP did not contract, but instead growth slowed to 5%. GDP growth returned to between 7% and 8% through the end of the decade, largely due to domestic demand.^{5,6}

India’s continued growth is not without challenges. Despite the country’s economic strength, some economists question whether India will soon feel the effects of slowdowns in the rest of the world.⁷ The fourth quarter of 2011’s growth rate, 6.1%, was the slowest rate in almost three years.⁸ That said, the country’s March 2012 Economic Survey predicts that India’s growth will rebound to 7.6% and 8.6% in 2013 and 2014, respectively.⁹

India’s strict investment and labor laws continue to create roadblocks in the private sector. In January 2012, the Indian government compromised on an effort to relax foreign investment policies and instead reversed long-standing ownership limits on single-brand foreign companies. These policies had required foreign

companies to have an Indian partner with a 51% ownership stake to operate in the country.¹⁰ At the same time, inflation — which reached 11% during the first half of 2010 but declined to 6.7% in January 2012 — continues to pose a threat, particularly to India's 250 million farmers.^{11,12} These issues are compounded by slow progress on infrastructure, corruption and poverty reduction, and limited job opportunities compared to the size of the labor market.

DOMESTIC POLITICS AND FOREIGN AFFAIRS

India boasts the world's most populous democracy and a vibrant political culture, with six recognized national parties alongside numerous state and regional parties. While two major national parties dominate the country's politics, neither is generally able to form a government without forging often contentious alliances with regional parties. The current government is a coalition, the United Progressive Alliance, led by the left-leaning Congress party. Prime Minister Manmohan Singh is the only prime minister to return to power for a second term since India's first, Jawaharlal Nehru. Yet despite this, his government has found it difficult to pass legislation due to coalition politics and a series of corruption scandals.

While India's domestic politics are unpredictable, the country's size and economic growth have increased its global influence. India is an outspoken member of the G20 and participates in other multilateral groups including the WTO and the SCO. India also has a long-standing interest in joining the UN Security Council as a permanent member and it has frequently put forward Indian candidates for leadership positions of major international institutions.

The Indian government is working openly to expand its global presence and to forge strategic partnerships with other countries. These range from immediate neighbors to traditional and new global powers.¹³ India has strong bilateral relationships with Afghanistan and Bangladesh and follows a "Look East" policy, emphasizing ties with the Association of Southeast Asian Nations (ASEAN) countries. The government has

In February 2012, Indian surpassed one year without detecting a single case of wild poliovirus and was removed from the list of polio-endemic countries. Just three years earlier, India had more polio cases than any other country in the world.

also worked to strengthen links with the US and European countries. Despite a difficult history, India has sought to increase positive political ties with China — its largest trade partner with bilateral transactions worth US\$60 billion in 2010. However, India remains wary of China, not least because of its close relationship with India's long-standing rival, Pakistan.¹⁴

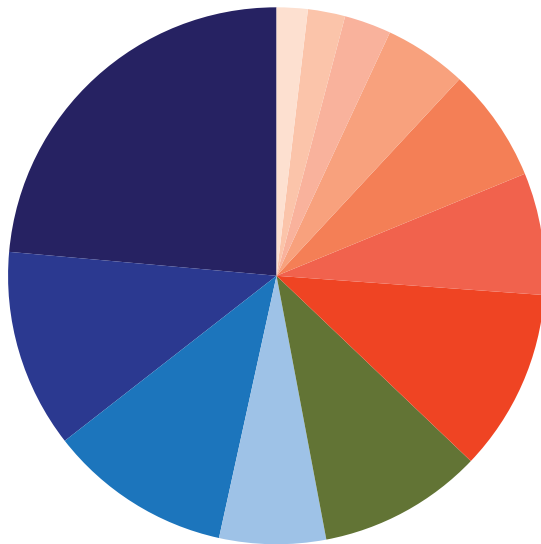
DOMESTIC HEALTH SITUATION

India is home to some of the most advanced health care facilities in the world and boasts one of the largest medical tourism industries globally. Yet at the same time, millions of India's poorest people lack access to basic health care and 43% of the country's children are malnourished.¹⁵ While health indicators are improving, the contradictions are stark. At 64.8 years, life expectancy is at an all-time high; however, it is still lower than other countries with similar economic standing.¹⁶ India also has some of the highest global burdens of infectious diseases and maternal, neonatal and child health problems. HIV/AIDS and TB kill 460,000 Indians annually, while childhood cluster diseases account for 220,000 deaths, the most of all the BRICS (Figure 4.1).¹⁷

There have, however, been areas of significant progress. In February 2012, Indian surpassed one year without detecting a single case of wild poliovirus and was removed from the list of polio-endemic countries. Just three years earlier, India had more polio cases than any other country in the world. India's success on polio was mainly funded by the Indian government itself, which contributed US\$1.49 billion since 2003, and it involved mass mobilization of local frontline health workers across the country. The Indian government has also taken initial steps to introduce the five-in-one pentavalent vaccine,

4.1 INDIA LEADING CAUSES OF DEATH, 2008

TOTAL: **9.9 MILLION DEATHS**



COMMUNICABLE DISEASES AND MATERNAL AND CHILD HEALTH CONDITIONS

- Diarrheal Diseases
- Perinatal Conditions
- Respiratory Infections
- Other
- TB
- Childhood Cluster Diseases
- HIV/AIDS

NON-COMMUNICABLE DISEASES

- Cardiovascular Diseases
- All Other Non-Communicable Diseases
- Respiratory Diseases
- Cancers

INJURIES

- Injuries

Source: WHO Global Burden of Disease, 2008

which would protect children from diphtheria, pertussis, tetanus, hepatitis B, and *Haemophilus influenzae* type b.

Beyond infectious diseases, India also faces a mounting burden of NCDs, which were responsible for 53% of all deaths in the country in 2008.¹⁸ Cardiovascular disease is currently the nation's leading killer and diabetes rates are increasing — India had 51 million cases in 2010, up from 32 million in 2000.¹⁹ India's NCD challenges are driven by an aging population, changes in eating habits, and genetic factors, which impact the entire country at all income levels.²⁰

While health care administration is a state-level issue in India, successive national governments have been increasing their investment in the health sector. The National Rural Health Mission (NRHM) was launched in 2005 to strengthen health infrastructure and ensure functional health systems for India's enormous rural population. The program has made significant progress, but inadequate human resources, among other

issues, continue to be a problem. The 2012-2013 Union Budget also increases focus on a number of key health areas, including immunization, rural health and human resources for health. It formally launches the National Urban Health Mission, which aims to improve the health of the poor living in India's urban slums.²¹ Health will be a major component of India's 12th five-year plan, which will be submitted in 2012 and will lay out the strategic vision for the country. The plan includes a commitment to increase government health expenditures to 2.5% of GDP by 2017 and to move toward universal health care.²²

India's Foreign Assistance

As its economy and international profile have grown, India has substantially increased both the size and scope of its foreign assistance program. Since 2005, it has committed to support

projects in nearly 80 countries. India uses foreign assistance as a diplomatic tool to build goodwill through horizontal cooperation, secure access to natural resources, open new markets for its domestic industries, and counterbalance China's growing influence. India openly rejects Western definitions and approaches, as well as the terms "donor" and "aid," preferring to view its efforts as a form of South-South partnership. While India does not have a unified approach to foreign assistance, it is working to increase efficiencies within its current programs. The Indian government is also in the process of establishing a central agency to oversee the country's development assistance activities.

TRENDS IN FOREIGN ASSISTANCE

India's foreign assistance program traces its roots to the 1950s, when Prime Minister Jawaharlal Nehru first committed funds to Nepal and Myanmar (then Burma). India's early assistance efforts focused on building local capacity in key neighboring countries to help foster pro-India sentiments.²³ In 1964, the country launched its cornerstone Indian Technical and Economic Cooperation (ITEC) initiative, which trained civil servants from developing countries. Yet despite these early programs, India continued to receive far more foreign assistance than it disbursed. Between 1951 and 1992, India accepted a total of US\$55 billion in foreign aid — making it the world's largest recipient.²⁴

In recent years, the Indian government has sought to move the country from net aid recipient to foreign assistance provider. In 2003, India announced that it would continue to accept bilateral assistance from only the US, the UK,

Indian policymakers do not view the country as a "donor" in the traditional sense. Instead, policymakers see India's assistance program as an expression of soft power centered on South-South solidarity, technical capacity building and sustainability.

Japan, Germany, Russia and the EU — though other donors were welcome to continue their assistance through NGOs and multilateral agencies. That same year, India began repaying debt to 15 countries, the World Bank and the Asian Development Bank.²⁵ Today, foreign assistance to India constitutes just 0.3% of the country's GDP, and the shift to net donor could come within a few years.²⁶

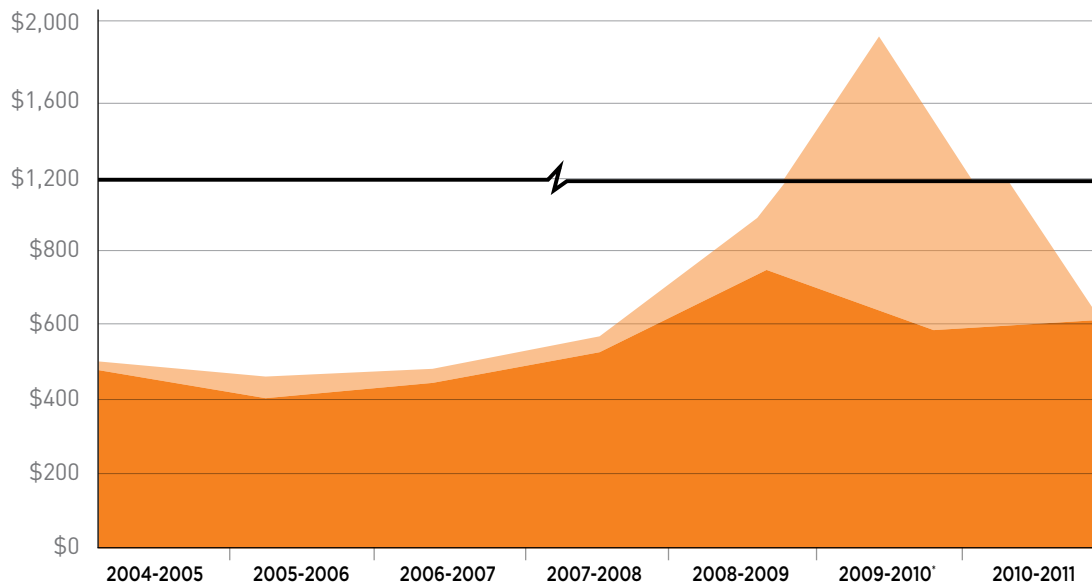
Indian policymakers do not view the country as a "donor" in the traditional sense. Instead, policymakers see India's assistance program as an expression of soft power centered on South-South solidarity, technical capacity building and sustainability.²⁷ They also emphasize that, unlike Western donor programs, Indian assistance is "demand-driven" and "reactive." The country does not put out formal requests for proposals; instead, recipients approach India for support as they deem necessary.²⁸ At the same time, however, India appears to be taking a more proactive approach to foreign assistance in an effort to counteract Chinese influence.

CURRENT FOREIGN ASSISTANCE PROGRAM

Because India views foreign assistance as an extension of foreign policy, its program is largely under the jurisdiction of the Ministry of External Affairs (MEA). The MEA works with the Ministry of Finance on assistance-related budget issues. The Ministry of Trade and Commerce also participates around private sector support and the Prime Minister's Office has discretionary funds that may be directed toward assistance programs.²⁹ Other ministries also play smaller roles. The government is currently working to better coordinate its international assistance, and in early 2012 it launched the Development Administration Partnership within the MEA to increase efficiency in the administration of its program. It is also in the process of launching a central assistance agency.³⁰

India does not systematically report foreign assistance figures, and what is reported is not comprehensive. This makes it difficult to quantify annual commitments or disbursements. However, in recent years the national budget has included

4.2 INDIA INTERNATIONAL ASSISTANCE COMMITMENTS (USD Millions)



Source: Union Budget and Economic Survey, Ministry of External Affairs, Ministry of Finance, Government of India; Government of India official interview; GHSi analysis
Note: *Marked spike in 2009-2010 a result of Ministry of Finance investment in international financial institutions

■ Multilateral Assistance
 ■ Bilateral Assistance

more assistance-related numbers, and from what data are publicly available it is clear that funding is increasing. Total Indian foreign assistance grew at an estimated 7.4% annually between 2004 and 2010, from approximately US\$443 million to US\$680 million over this period (Figure 4.2).

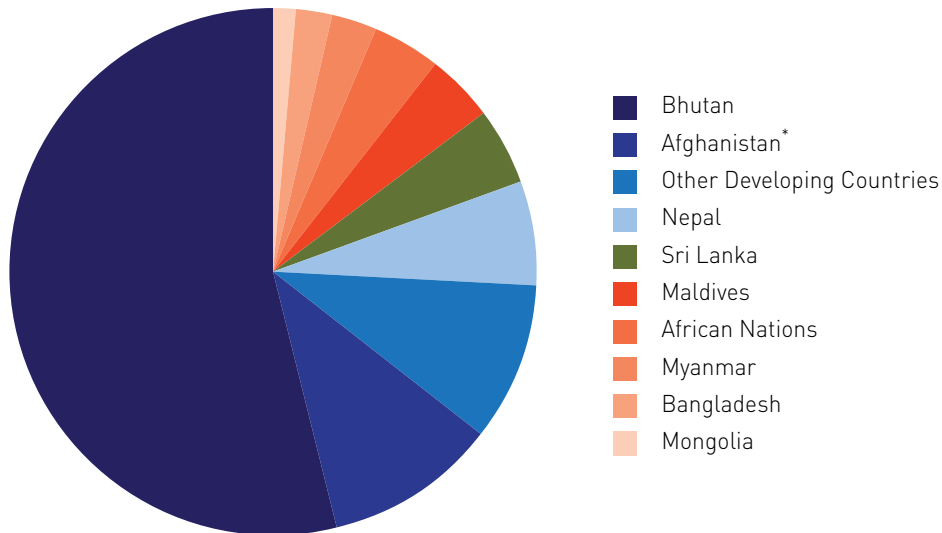
Indian foreign assistance typically includes technical cooperation, grants, contributions to international organizations, soft loans, and Export-Import (EXIM) Bank lines of credit with subsidized interest rates. Lines of credit are designed to be repaid by recipient countries with the Ministry of Commerce covering the difference between actual and subsidized rates.³¹ The vast majority of these resources are channeled through bilateral programs (Figure 4.2). Indian policymakers believe bilateral approaches best align with the country's demand-driven, horizontal philosophy and allow for innovative programming, including public and private sector involvement. However, India has on occasion provided very large contributions to multilaterals for assistance programs, particularly international

finance institutions like the African and Asian Development Banks. In 2009, India committed US\$1.4 billion to these types of organizations.³²

In terms of geographic focus, the majority of India's assistance continues to go to neighbors including Bhutan and Nepal in order to build goodwill in the region (Figure 4.3).³³ In recent years, India has also attempted to build a stable relationship with Afghanistan. As a result, its assistance to Afghanistan — including bilateral activities and lines of credit — now totals upward of US\$1 billion, making India the country's fifth largest donor.³⁴ India has historic ties to Afghanistan and Afghan President Hamid Karzai was educated in India through the ITEC program. Yet the recent exponential growth in Indian assistance to Afghanistan is also driven by regional politics, including India's strained relationship with Pakistan.

India is currently shifting toward a more economically driven assistance program focused on accessing natural resources and developing

4.3 TOP 10 RECIPIENTS OF INDIAN BILATERAL COMMITMENTS, 2004-2010



Source: Union Budget and Economic Survey, Ministry of External Affairs, Ministry of Finance, Government of India; Government of India official interview; GHSi analysis

Note: *Does not account for total lines of credit, which would significantly increase assistance figures, especially for Afghanistan and African nations; USD:INR currency conversion based on IMF annual average exchange rates

new markets for its growing industries.^{35,36} The Indian government has significantly increased foreign assistance to Africa through both technical cooperation and financial support, and in 2011 Prime Minister Singh announced a US\$5 billion line of credit to help fund economic development on the African continent.³⁷ The Confederation of Indian Industries (CII) also organizes an annual meeting known as the CII-EXIM Bank Conclave on India Africa Project Partnership to strengthened bilateral and multilateral relationships across the continent. India has increased its engagement with Latin America as well, though to a lesser degree.³⁸

Indian assistance often takes the form of support for high-cost infrastructure projects, including construction and power generation, as well as lower-cost projects in information technology (IT). Assistance in Africa also tends to focus on building the capacity of local civil servants and managers working in state-owned enterprises.³⁹ A majority of these projects also benefit India. Lines of credit are typically linked to Indian goods and services and many private companies and state-run enterprises collaborate on projects.^{40,41} When projects are in neighboring countries, India also receives infrastructure benefits; for example, hydroelectric plants constructed in Bhutan provide India with a steady source of electricity.⁴²

India's Health Assistance

Global health assistance makes up only a small portion of India's overall foreign assistance program, but it appears to be growing.⁴³ Activities predominantly include lower-cost bilateral projects focused on infrastructure, human resources, capacity building and education. Indian policymakers have expressed expectations that India's engagement in health will expand as other developing countries learn more about its successes in the area.

MAJOR TRENDS IN HEALTH ASSISTANCE

Despite substantial economic growth, India continues to face major health challenges. With this in mind, the Indian government is dedicating significant resources toward developing innovative programs and strategies to improve health domestically. Priorities currently include infrastructure strengthening and capacity building at the secondary and tertiary levels, providing access to and incentivizing maternal and child health care, and NCD prevention and management.⁴⁴ The 2012-2013 Union Budget also sharpens the focus on vaccine production and access to services for India's rural and urban poor.⁴⁵

With its attention focused on domestic issues, India's global health assistance is limited when compared to assistance for other sectors. However, efforts to improve health domestically are providing a range of lessons learned and best-practices that

Indian policymakers believe the scope of the country's health assistance program will continue to expand as recipient countries become more aware of its "[experiences] in tropical medicine and infectious diseases and [its capacity in] public health initiatives, training and R&D.

are proving to be of interest to other developing countries. The number of Indian health assistance projects appears to be growing as these countries increasingly understand India's strengths in the area.⁴⁶ Since India provides reactive, demand-driven health assistance, recipient requests are guiding the country's programs, which tend to emphasize knowledge sharing, capacity building and infrastructure strengthening.

Indian policymakers believe the scope of the country's health assistance program will continue to expand as recipient countries become more aware of its "[experiences] in tropical medicine and infectious diseases and [its capacity in] public health initiatives, training and R&D."⁴⁷ Policymakers are also interested in finding opportunities to leverage India's robust private health sector and civil society in future health assistance efforts.⁴⁸

BILATERAL ASSISTANCE FOR HEALTH

In line with its broader assistance strategy, India prefers bilateral health assistance to multilateral programs. Since 2009, India has committed at least US\$100 million to bilateral health projects in nearly 20 countries in South Asia, Southeast Asia and Africa. Afghanistan appears to have received the most health assistance, both in terms of absolute cost and range of projects.⁴⁹

India's bilateral health assistance includes a relatively large number of projects that are lower in cost than comparable projects in other sectors. The majority of health projects funded by India have budgets between US\$20,000 and US\$3 million, while infrastructure projects — energy and sanitation, for example — may reach hundreds of millions of dollars.⁵⁰ As noted, India provides health assistance in areas of relative strength, including infrastructure, IT and training. These activities all focus on building capacity within recipient countries.

HEALTH INFRASTRUCTURE

The bulk of India's health assistance comes in the area of infrastructure development. The country has helped construct or improve hospitals and clinics in the majority of its immediate neighbors,

as well as countries throughout Africa. Recipient countries also consistently approach India for medical supplies, and the government has donated a range of medicines, diagnostics, ambulances and other equipment to support their health response. Construction projects tend to have budgets ranging from US\$200,000 to US\$3 million, while donations are generally worth below US\$1 million.⁵¹

HEALTH IT

India's IT sector has a very strong reputation, and countries have approached the government for support in developing e-health platforms. These projects are often classified as IT assistance, but they have had direct impact on health in recipient countries.⁵² One of India's most significant projects is the Pan-Africa Telemedicine and Tele-Education Network, where hospitals and universities throughout Western Africa are being linked with counterparts in India to facilitate sharing best

practices. India has also committed to provide similar support in Bhutan, Nepal and Afghanistan through a South Asian Association for Regional Cooperation (SAARC) initiative.⁵³

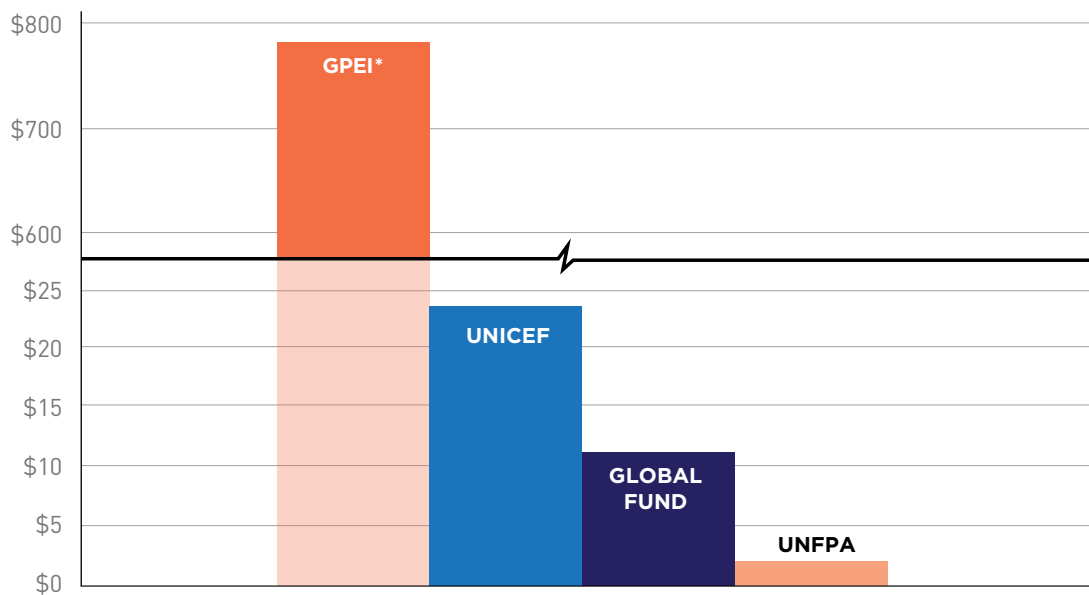
CAPACITY BUILDING AND EDUCATION

India is well known for having a large, educated cadre of health care professionals. Recognizing this, other developing countries have approached India for help in strengthening their own health care workforces. India has established medical colleges and provided faculty support in a number of countries, particularly Bhutan and Nepal.⁵⁴

MEDICAL MISSIONS

While Indian support for medical missions appears to be small, the country has assisted humanitarian programs for a number of years in five cities in Afghanistan: Kabul, Herat, Mazar-e-Sharif, Kandahar and Jalalabad. Through this program,

4.4 INDIA CONTRIBUTIONS TO KEY HEALTH MULTILATERALS, 2006-2010 (USD Millions)



Source: GPEI; UNICEF; UNFPA; Global Fund

Note: *India contributes funds to the GPEI for its domestic polio eradication program; it contributed US\$300,000 toward GPEI broadly in 2006

India has deployed 15 health-care providers and enough free medicines to treat 360,000 of Afghanistan's poorest patients annually.⁵⁵ India has also sent medical missions to Africa.⁵⁶

MULTILATERAL AND TRILATERAL ASSISTANCE FOR HEALTH

Due to its preference for bilateral programs and limited overall assistance budget, Indian support for health multilateral organizations is small. The notable exception is the GPEI, which India uses as a mechanism to fund its own domestic eradication efforts. Between 2006 and 2010, India gave the GPEI US\$781 million, which the GPEI then used to fund programs inside the country (Figure 4.4). India has contributed a total of US\$1.49 billion to the GPEI since 2003.⁵⁷ It has also made small contributions to the Global Fund, UNICEF and UNFPA.

India is involved in several relatively small trilateral health partnerships. In 2002, India pledged to provide 1 million metric tons of high-protein biscuits — worth US\$100 million — to support the World Food Programme's School Feeding initiative in Afghanistan. India's contribution is helping to provide nutritious snacks for two million school-going children over a number of years.⁵⁸ India has also supported some trilateral health efforts through IBSA, including a number of infectious disease R&D collaborations with Brazil and South Africa. Finally, policymakers believe that India could play a role in increasing the emphasis on health within regional institutions like SAARC.⁵⁹

Indian Innovation and Implications for Global Health

To date, India's most significant contributions to global health innovation have come from its robust private sector. Indian biopharmaceutical companies have had enormous impact by dramatically driving down prices for HIV/AIDS treatments and vaccines for leading causes of childhood morbidity and mortality. Yet at the

same time, the Indian government increasingly recognizes the potential for innovation to accelerate efforts to address its own health-care challenges. The government has announced several ambitious plans to catalyze scientific innovation in the public and private sectors in the hopes of producing new health tools. When and if these approaches become available, they could provide additional, low-cost options for addressing health challenges in the poorest countries.

KEY TRENDS IN HEALTH INNOVATION

India's private drug and vaccine manufacturers have revolutionized health in developing countries by expanding access to generic products. These companies are able to tap into India's large pool of highly educated scientists, medical practitioners and IT professionals. They are also increasingly investing in new early R&D programs.

While India's most visible impact on global health continues to be through low-cost manufacturing, the country has also produced a range of innovative approaches to health service delivery

Council of Scientific and Industrial Research

The Council of Scientific and Industrial Research (CSIR) is an autonomous government body funded primarily by the Indian Ministry of Science and Technology. Founded in 1942, CSIR is one of India's premier industrial research and development organizations with 39 laboratories and field stations across the country. Among several key focus areas, CSIR is heavily involved in biotechnology research to address global health issues. The agency played an important role in the development of alternative and cheaper techniques for manufacturing ARVs to treat HIV/AIDS, which were then transferred to Cipla. CSIR has also developed novel antibiotics for TB, and it recently established an Open Source Drug Discovery initiative to spur development of other novel therapies.

that have become models for programs in other countries. The TB Research Centre in Chennai, for example, conducted many of the initial studies that laid the groundwork for the development of directly observed treatment short-course (DOTS) — the preferred global TB treatment strategy. More recently, telemedicine providers in India have helped make access to health advice easier for people in developing countries.^{60,61} In March 2012, India also pledged to increase scientific collaboration with African nations around a number of key areas, including capacity building, science and technology innovation for development, knowledge transfer and adoption.⁶² Some of these programs have been supported by other donors, and overall, India still faces enormous health delivery challenges. Yet the fact that India is tackling these issues at the same time as other countries has enabled its successes to provide immediate templates.

In the public sector, Indian policymakers are increasingly emphasizing the need for innovations to ensure all Indians have access to appropriate health services. Much of India's government health research funding is directed to the nearly 40 biomedical research centers that comprise the Indian Council of Medical Research and the Department of Biotechnology (DBT). The latter has been central in encouraging health innovation across the country, including new vaccines for rotavirus. The Department of Science and Technology (DST) and the Council for Scientific and Industrial Research (CSIR) also conduct significant health research.

The Indian government's increased investments in health research coincide with the launch in 2010 of what policymakers have declared the "Decade of Innovation."⁶³ That year, the Indian government established the National Innovation Council (NIC), which is charged with developing a roadmap for innovation in the country in several areas, including health. In conjunction with the NIC, the government also plans to launch a US\$1 billion "India Inclusive Innovation Fund" by July 2012 to encourage innovative solutions for problems afflicting the poorest in the country.⁶⁴

In addition, there have been examples of public and private innovation partnerships with other

Indian companies manufacture between 60% and 80% of all vaccines procured by UN agencies, making India by far the largest provider of affordable, high-quality vaccines for developing countries.

BRICS. IBSA has facilitated partnerships on HIV vaccine and TB research, and the Mumbai-based drug manufacturer Lupin Ltd. has partnered with Farmanguinhos and the Brazilian Ministry of Health to support the introduction of a four-in-one combination TB drug. Under the deal, Lupin will provide a technology transfer that will help Farmanguinhos establish its local manufacturing facility.⁶⁵

KEY HEALTH INNOVATION CASE STUDIES

GENERIC ARV MANUFACTURING

Indian manufacturers currently provide 80% of all donor-funded HIV therapies in developing countries — drugs used by millions of patients.⁶⁶ In 2001, the Mumbai-based drug manufacturer Cipla began producing triple-therapy ARVs at a cost of US\$350 per patient per year, which was one-thirteenth of the standard price at the time. Ranbaxy, a Gurgaon-based drug manufacturer, quickly followed Cipla's entry into the ARV drug market.⁶⁷

Not only did these producers impact global prices, they also created simplified ARV treatment regimens for people living in poor countries. Cipla's new drug combined three different ARVs into a single tablet, which reduced the number of pills taken each day. Fixed-dose combinations (FDCs) like these make taking medications more convenient, and are believed to help improve treatment adherence, thereby reducing drug resistance. While ARV FDCs had been developed before, Cipla's product was unique because it combined three ARVs that were licensed by three separate pharmaceutical companies. The new FDCs were also heat-resistant enough for use in developing countries where appropriate refrigeration can be scarce.⁶⁸ As a result, HIV/

WHO Prequalification

WHO created the prequalification process in 2001 to ensure that medicines, vaccines and diagnostics procured by UN agencies meet acceptable standards of quality, safety and efficiency. To achieve prequalification status, manufacturers must submit data on their product and an inspection team must verify that the manufacturing site complies with WHO practices. Medicines, vaccines and diagnostics that pass these tests are added to a list that multilateral organizations, such as UNICEF and the World Bank, use to guide procurement. Additionally, many developing countries use the prequalification lists as proxies for national regulatory approval processes.

AIDS patients living in developing countries received access to better medicines than many people living in high-income countries.⁶⁹ Since then, prices have continued to drop in parallel with production and delivery costs, while still proving profitable for Indian companies.

Alongside a number of other actors, Indian ARV manufacturers also helped spur efforts to challenge the IP rules preventing access to generic drugs, beginning with the 2001 Doha Declaration on the Trade-Related Aspects of Intellectual Property Rights Agreement (TRIPS) and Public Health. These IP challenges have dramatically influenced global health policy, but while they have improved health access, many core issues remain unresolved. Since 2011, global AIDS activists have been protesting a free trade agreement currently under discussion between India and the EU that could strengthen IP regulations on HIV drugs and undercut access to ARVs. Meanwhile, in March 2012, India issued its first-ever compulsory license for a cancer drug. Many experts believe this move could open the door to compulsory licenses for a variety of life-saving drugs from both India and other developing countries.⁷⁰ In addition, Indian policymakers are also currently debating the appropriate levels

of foreign direct investment (FDI) in Indian pharmaceutical companies, because many believe it will have an impact on accessibility to drugs within the country.⁷¹

In the meantime, Cipla recently partnered with a Ugandan manufacturer to further reduce the cost of treatment and address some of the transport challenges that impede drug delivery in Africa.⁷² In addition to improving drug access and building local capacity, South-South collaborations like this one could help bypass increased restrictions on IP.

INDIA'S VACCINE INDUSTRY

Eight manufacturers in India currently produce 72 WHO prequalified vaccines — more than are produced in any other country (Figure 4.5). In addition, Indian companies manufacture between 60% and 80% of all vaccines procured by UN agencies, making India by far the largest provider of affordable, high-quality vaccines for developing countries.⁷³

Revenues in India's vaccine industry were estimated to be approximately US\$900 million in 2011. They are expected to grow by 23% from 2011 to 2012.⁷⁴ However, funders are increasingly vigilant about the quality of vaccines produced in India.⁷⁵ WHO recently delisted several vaccines from Panacea Biotec and Bharat Biotech after routine inspections of their manufacturing facilities unearthed quality control issues.

India began producing innovative vaccines more than a century ago. The world's first plague vaccine was developed in Mumbai in 1897, and an indigenous cholera vaccine was developed in Kolkata. Indian public institutes soon began producing biological products for domestic use, including DTP, MMR, tetanus toxoid and snake antivenin.⁷⁶ In the years following independence, a handful of private vaccine manufacturers, including the Serum Institute of India (SII) and Biologicals E Ltd., began producing vaccines for domestic programs. Beginning in the 1980s, SII began engaging with international agencies — including WHO, PAHO and the UN — to discuss providing vaccines for global use.⁷⁷ In the decade that followed, Indian vaccine manufacturers emerged internationally, and SII is currently the largest provider of vaccines by dose worldwide.⁷⁸

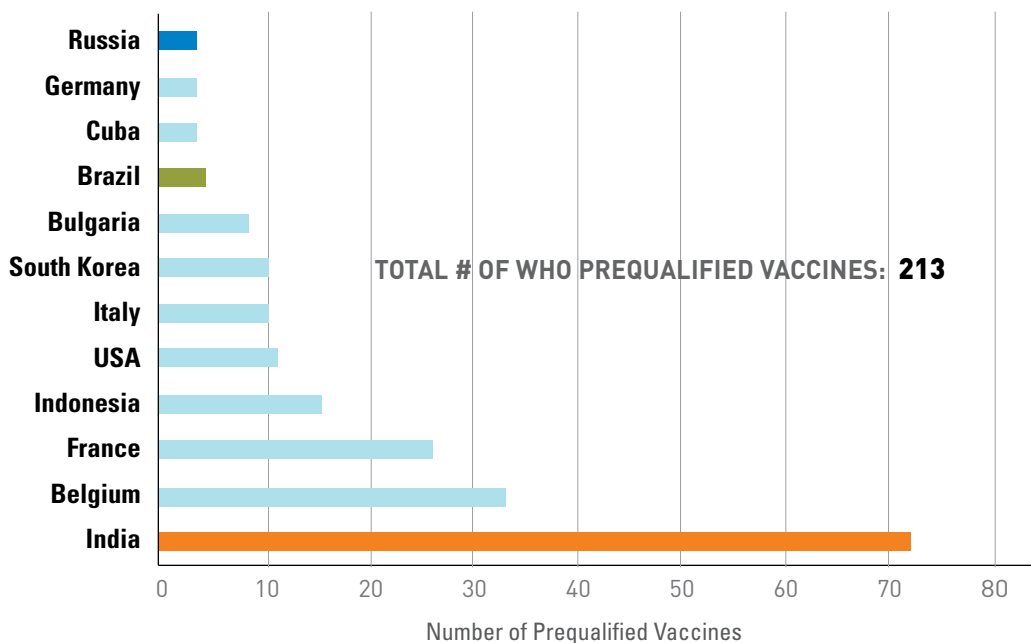
Indian manufacturers have also developed a number of innovations that have helped expand vaccine supply and push down prices. Before 1990, only multinational vaccine companies produced recombinant hepatitis B vaccines, and the average price was US\$23 per dose. Shantha Biotech, based in Hyderabad, developed a novel process for manufacturing the vaccine, thus creating India's first indigenous recombinant product. The price is now less than US\$1 per dose. WHO prequalified Shantha's vaccine in 2002 and it is now available for procurement by UN agencies for use in other developing countries.⁷⁹

Global health organizations also increasingly turn to Indian manufacturers to proactively improve vaccine access in poor countries. In December 2010, MenAfriVac, the first vaccine designed specifically for Africa, was launched in Burkina Faso. MenAfriVac was developed by a collaboration between SII, PATH and WHO, with funding from the Gates Foundation. The inexpensive vaccine protects against meningitis

A, which is endemic in the "Meningitis Belt" along the southern edge of the Sahara Desert from Senegal to Ethiopia. In addition to Burkina Faso, MenAfriVac has been introduced in Niger and Mali. During the 2009-2010 meningitis season, there were more than 10,000 meningitis A cases in these three countries. Following introduction of the new vaccine, the 2010-2011 season saw only eight cases.⁸⁰

A number of Indian vaccine companies also have novel vaccines in the pipeline for diseases including rotavirus, pneumococcus and human papillomavirus (HPV) — all vaccines that have been limited in their introduction in developing countries. Several of these companies have received technical or financial support in their research from the Indian government and international organizations including the GAVI Alliance, PATH, International Vaccine Institute (IVI) and the Gates Foundation. As the Indian vaccine sector has matured and evolved, some companies — including Shantha — have been

4.5 TOP 10 COUNTRIES WITH WHO PREQUALIFIED VACCINES, 2012*



Source: World Health Organization

Note: *Data accurate as of 11 March 2012

Unique Identification Authority of India

In 2010, India formally launched an initiative to provide every citizen with a 12-digit identification number (UID). The Unique Identification Authority of India (UIDAI) is charged with issuing the UID numbers and maintaining a database of residents containing biometric data and other information. To date, more than 110 million UID numbers have been issued, with significant implications for health. Linking UID information with hospital or medical facility records could inform public health program managers of the prevalence of various routine disease conditions and prepare the health system to respond to unforeseen epidemics. The UIDAI is planning to partner with Rashtriya Swasthya Bima Yojana (RSBY) — another government program aimed at providing insurance to those living below the poverty line — to improve efficiency in terms of health insurance.

acquired by large multinationals. At the same time, the industry acknowledges that new trade agreements and IP regulations threaten the long-term viability of Indian vaccine manufacturers unless they continue to build up their internal R&D capacity.

LOW-COST SERVICE DELIVERY

India is often noted as a source of what experts call “frugal innovation” — the ability to do more with less.⁸¹ Business leaders and health providers in India have applied this concept to several aspects of health services, with active support from the IT sector and growing mobile phone industry. These cost-cutting approaches have expanded access to quality health services among some of the poorest people in India, and are starting to be applied globally.

Aravind Eye Hospital has been providing low-cost vision care in India for more than 30 years. It is currently the largest ophthalmological organization in the world, treating approximately

2.4 million outpatients and organizing more than 1,000 screening camps annually.⁸² The organization employs a unique business model that allows it to deliver quality services to all patients — no matter their income level — while remaining profitable. Aravind provides free or extremely low-cost services to nearly 65% of its patients, and derives its revenue from those who are able to pay.⁸³ Aravind also ensures that its care providers are able to maintain high patient volumes through detailed program management, and it now manufactures its own intraocular lenses at significantly lower costs than other suppliers. Beyond India’s borders, Aravind has provided technical assistance to institutions in China and Egypt in an effort to strengthen innovative eye care in those countries.

Another example of frugal innovation is India’s private hospitals. Many of India’s leading private hospitals have traditionally catered to the rich and to medical tourists. Yet managers at these health providers have begun proactively identifying ways to cut costs and deliver services to a larger cross-section of India’s population — expanding their market while benefiting poor populations. The Apollo Hospitals chain is planning to expand into less-populated areas in India and cut costs for patients through lower overheads and reduced travel to larger cities.⁸⁴ Apollo’s administrative costs are already on average 7% of the patient’s bill, compared to an average of 25% in the US.⁸⁵

Finally, many health providers in India are collaborating with the IT and telecommunications sectors to deliver services to low-resource settings. The Indian Space Research Organization (ISRO) is working in several states across India to initiate telemedicine centers that serve those in hard-to-reach areas. The centers link with several specialty hospitals to provide tailored health advice to patients. The Pan-African e-Network partnership between the Indian government and the African Union (AU) is looking to implement similar models that will link patients and practitioners in India and Africa. The Unique Identification Authority of India (UIDAI) also sees several opportunities for improving access to a variety of health services, including immunization and maternal health.


**GOVERNMENT OF INDIA,
DEPARTMENT OF BIOTECHNOLOGY (DBT)**

The DBT is a key hub for Indian health innovation. DBT's mandate covers health, agriculture, environment and animal science. However, health is a core component of DBT's activities and accounted for a significant proportion of the organization's US\$180 million annual budget in 2009 and 2010.⁸⁶ The agency also collaborates with institutions in countries around the world, including SAARC and ASEAN countries. Many of these projects focus on R&D and capacity building between countries.

The DBT was established in 1996 as a division of the Ministry of Science and Technology, with an initial focus on strengthening advanced degree training in the biological sciences. This work continues today, and the department recently announced an initiative to build academic capacity in the biosciences through six new research institutions and long-term partnerships with leading national universities and research centers.⁸⁷ Yet the agency has expanded its activities by engaging the private sector in innovation, including helping to establish innovative biotechnology research and incubation parks to support new biotechnology companies. These research parks received more than US\$600,000 in 2009 and 2010 from the DBT.⁸⁸

In addition, two flagship programs provide funding for businesses with significant innovation potential. The Small Business Innovation

Research Initiative provides small and medium biotechnology companies with funding for proof-of-concept research and late-stage product development. To date, the program has resulted in the commercialization of a recombinant follicle stimulating hormone, the development of a silk protein film for burn victims, and an auto dispenser for diagnostic applications.^{89,90} The Biotechnology Industry Partnership Programme provides funding to companies on a cost-sharing basis with a particular focus on developing technologies to address the country's pressing development priorities.⁹¹ The program also aims to build indigenous IP.

At the same time, DBT has significantly supported new vaccine innovations in India. A live attenuated oral rotavirus vaccine — developed through a unique partnership between the DBT, Bharat Biotech, the Society for Applied Studies, the National Institute of Immunology, the Translational Health Sciences Technology Institute, the Indian Institute of Science, and the All India Institute of Medical Sciences — is currently in Phase III clinical trials. PATH, the US Centers for Disease Control (CDC), the US National Institutes of Health (NIH), Stanford University and the Gates Foundation are providing technical expertise and program funding. Under the partnership, Bharat Biotech will provide the vaccine to the Indian government's National Immunization Program at US\$1 per dose. If clinical trials continue to go well, the vaccine could be available as soon as 2014.^{92,93} 



5 CHINA

China holds significant power among the BRICS and globally. In 2010, after more than 30 years of sustained economic growth, China eclipsed Japan to become the world's second largest economy.¹ The country's GDP has increased by an average rate of 10% since 1980, and it now boasts an economy larger than all of its BRICS counterparts combined.^{2,3} Export-driven growth has helped China build enormous foreign currency reserves, and it has allowed the government to make massive investments in infrastructure, industry and, increasingly, innovation. The country's political and military power is growing and China holds a permanent seat on the UN Security Council.⁴ China also commands strong influence among low- and middle-income countries, and has established important economic ties in regions throughout the world. Yet when measured by per capita indicators, China remains a developing country, and it faces challenges including a massive population, shifting demographics and politics, high levels of income inequality and slowing growth.

ECONOMIC LANDSCAPE

Starting in the late 1970s, after decades of relative political and economic isolation, the Chinese government began to move the country away from a centrally planned economy toward a more market-oriented system — albeit one with strong government controls. This shift spurred rapid economic and social transformations that have continued ever since.⁵

China's growth over the past three decades has supported the largest reduction in poverty and the fastest increase in national income ever seen in any country.⁶ Much of this is owed to government investment in infrastructure and industry, with an

eye toward establishing an export-driven economy. Exports of goods and services now account for 30% of the country's GDP — and in 2010 China became the world's largest exporter, surpassing Germany.^{7,8} China's massive population and cheap labor have been an advantage in this regard, helping to fuel enormous industrial capacity, and since 1980 approximately 200 million rural laborers and their dependents have relocated to urban areas to find work in factories and other industries.⁹ However, new labor force entrants are expected to decline substantially as a result of China's "one-child" policy and an aging population, and wages and expectations are rising.¹⁰ This could erase many of the current economic benefits of China's enormous labor pool.

More recently, China's government has begun to emphasize domestic consumption to balance rising income levels, shifting demographics and reduced growth in international demand. China's dependence on exports was highlighted during the global financial crisis, which threatened the manufacturing sector.^{11,12} Yet the country's economy showed significant resilience. In 2012, the Chinese government cut its annual economic growth target for the first time in eight years, but government stimulus funds and policy changes have so far helped offset turbulent movements of capital.¹³ Threats to continued growth remain, but China's strength stands out in comparison to the struggling economies of the traditional powerhouses of the G8. In 2011, European leaders went so far as to ask the Chinese government to consider investing in measures to shore up the EU economy.¹⁴

DOMESTIC POLITICS AND FOREIGN AFFAIRS

China is a socialist country led by the Chinese Communist Party. For the past decade, leaders including President Hu Jintao and Premier Wen Jiabao have led the country's economic and geopolitical ascendance. However, in 2012, the Party leadership will undergo a transition for the first time in ten years. While the handover of power is expected to be smooth, it comes at an uncertain time for the global economy and amid wide-reaching social change within China.¹⁵

As a result of its massive economic influence, China has begun to play an increasingly assertive and outspoken role in international affairs. The country has become a vocal presence at G20 discussions — particularly since the onset of the global financial crisis. China is also a prominent member of many multilateral institutions, and a key partner in regional organizations including ASEAN and the Asia-Pacific Economic Cooperation Forum.¹⁶

China's growth over the past three decades has supported the largest reduction in poverty and the fastest increase in national income ever seen in any country.

In 2009, China's leaders committed an unprecedented US\$124 billion for health sector reform over three years. This initiative aims to improve infrastructure and human resources capacity across the health system, and ensure health insurance for the whole population.

China has also sought to establish strong bilateral trade and development ties in Africa, Southeast Asia and Latin America, and it has convened regular cooperative meetings such as the Forum on China-Africa Cooperation (FOCAC). China's rising global stature has led to some criticism of its policies on trade, currency exchange and human rights. In response to these concerns, the Chinese government emphasizes its belief that China remains a developing country, and that it is inappropriate for any country to intervene in another's domestic affairs.^{17,18}

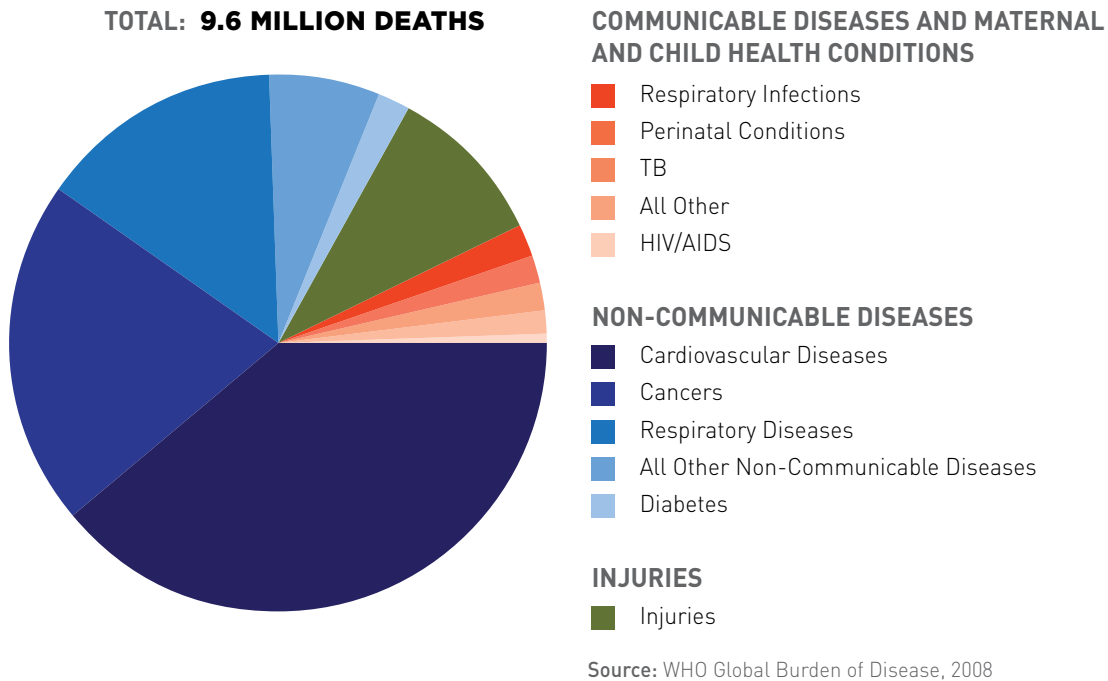
DOMESTIC HEALTH LANDSCAPE

Like other BRICS, China still faces a large burden of infectious diseases, including TB, hepatitis and HIV/AIDS.¹⁹ TB — including drug-resistant TB — is the country's top infectious killer, and China is home to around one-third of all hepatitis B carriers worldwide.²⁰ HIV/AIDS prevalence rates remain relatively low (around 0.1%), due in part to a series of aggressive HIV/AIDS prevention and treatment programs initiated in 2003.^{21,22} However, China recently released data showing that HIV/AIDS cases had increased by 45% over 2006 levels.²³

As China's economy has grown, chronic NCDs have become more common. NCDs constituted 83% of deaths in 2008 (Figure 5.1), up from 58.2% of deaths during 1973 to 1975, and the burden continues to grow.²⁴ Hypertension, diabetes and obesity are all major concerns, particularly in urban settings.²⁵ China is also the world's largest consumer and producer of tobacco, and the country is home to one out of every four tobacco-related deaths worldwide.²⁶

Access to basic health care remains a critical challenge for China's population. China boasts world-class medical facilities in its major

5.1 CHINA LEADING CAUSES OF DEATH, 2008



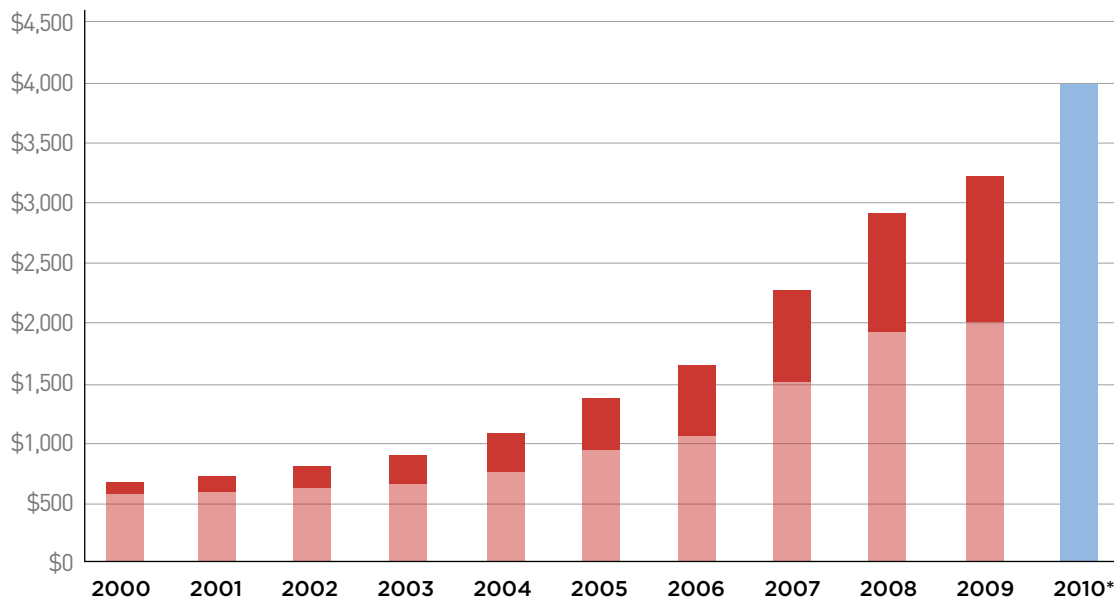
cities, but health care infrastructure varies substantially across regions and income levels — and migrant workers often have difficulty in accessing care. In the early 1980s, the government moved to reduce spending on health and to privatize health care.²⁷ This was particularly damaging in rural communities, which found themselves with little access to health insurance or consistent health services.²⁸ These trends continued until the 2003 SARS outbreak exposed critical shortcomings in China's health care system, laying the groundwork for reforms.²⁹

In 2009, China's leaders committed an unprecedented US\$124 billion for health sector reform over three years. This initiative aims to improve infrastructure and human resources capacity across the health system, and to ensure health insurance for the whole population.³⁰

China's Foreign Assistance

China has a long history of providing foreign assistance. Since 1950, the country has committed various forms of aid to more than 160 countries and 30 international organizations.³¹ Yet China's foreign assistance programs have expanded in parallel to the country's enormous economic growth. While China does not publicly report annual assistance figures, it appears that Chinese aid is rapidly increasing and the government disbursed an estimated US\$3.9 billion in 2010 (Figure 5.2).³² China's approach to foreign assistance is driven by a commitment to South-South cooperation through mutually beneficial economic development, infrastructure and trade projects, and non-interference in the domestic affairs of other countries. The stated goal is to help recipient countries strengthen their capacity for self-development, and it appears to reflect China's own recent history and current experiences.

5.2 CHINA OFFICIAL FOREIGN ASSISTANCE (USD Millions)



Source: "The Dragon's Gift: The Real Story of China in Africa," D. Brautigam, 2009; GHSi Analysis
 Note: *GHSi estimate

■ Official External Assistance
 ■ EXIM Bank Concessional Loans

TRENDS IN FOREIGN ASSISTANCE

Since the 1950s, China has prioritized foreign assistance as a tool for geopolitical engagement.³³ At its start, China's foreign assistance program targeted socialist neighbors in support of their security and socioeconomic development. In the 1960s, China began looking beyond its neighbors, particularly to Africa.³⁴ Under Mao Zedong, the Chinese government felt it was the state's obligation to help post-colonial regimes modernize.³⁵ However, foreign assistance also allowed China to build strategic relationships with "non-aligned" states during the Cold War, and helped China to compete with Taiwan for diplomatic recognition.³⁶

As the Chinese government implemented economic reforms in the 1980s and 1990s, policymakers began to explore new approaches to foreign assistance. China began to emphasize the economic aspects of assistance and use

it to promote trade and mutually beneficial development projects in recipient countries.³⁷ Today, China sees itself as a leader among developing countries and prides itself on its philosophy and commitment to South-South cooperation and self-sustaining economic development. The government views this as being in direct contrast to the Western donor approach. China also explicitly rejects Western models of assistance that impose political and socioeconomic conditions on recipients.³⁸ While China does invest heavily in countries where it has strategic economic and political interests, it maintains a policy of noninterference in the internal affairs of other countries.³⁹

CURRENT FOREIGN ASSISTANCE PROGRAM

China releases very little information about annual or country-level foreign assistance and until recently, China had never announced a formal development assistance policy.⁴⁰ At the Global Aid

Today, China sees itself as a leader among developing countries and prides itself on its philosophy and commitment to South-South cooperation and self-sustaining economic development.

Effectiveness Forum in 2011, China declared “the principle of transparency...should not be seen as a standard for South-South Cooperation.”⁴¹

However, that same year, China released a white paper on foreign assistance highlighting the government’s overall policies and programs, including cumulative funding totals from 1950-2009, regional focus and management.⁴² According to this document, China has given a total of US\$40.5 billion in cumulative foreign assistance since 1950, and assistance increased at an annual rate of 29.4% between 2004 and 2009.⁴³

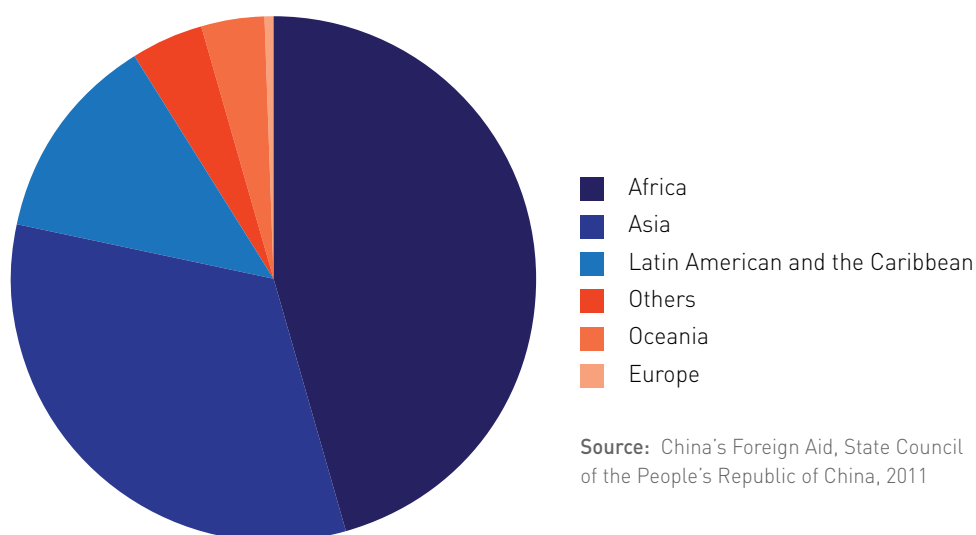
China’s white paper portrays the country’s foreign assistance very differently than many external theories about its program. Prior to the white paper’s release, some China scholars believed that the country’s foreign assistance — particularly in Africa — had grown so large that it was on par with the US and the World Bank.⁴⁴ A 2008 study by New York University’s Wagner Graduate School of Public Service estimated

that Chinese foreign assistance totaled around US\$25 billion in 2007 alone.⁴⁵ However, these estimates include Chinese economic investments that are not defined as assistance by the Chinese government. While China employs a different approach to assistance than many Western donors, its policymakers draw a clear distinction between what they consider to be trade or foreign direct investment and what they consider assistance. The latter is solely comprised of grants, interest-free loans and concessional loans to other developing countries.⁴⁶

The majority of China’s foreign assistance is provided through bilateral channels and focuses heavily on infrastructure — a development priority that many traditional donors have moved on from in favor of social programs.^{47,48} Based on cumulative figures, the largest share of Chinese assistance since 1950 — about 41% — has been allocated through grants, which are focused on infrastructure projects such as schools and hospitals and humanitarian aid. Interest-free and concessional loans have generally focused on heavy infrastructure projects including transportation and energy, and industrial development.⁴⁹

Geographically, Chinese foreign assistance focuses on Africa and East and Southeast Asia, and the government reports that nearly 80% of

5.3 CHINA FOREIGN ASSISTANCE BY REGION, 2009



Source: China’s Foreign Aid, State Council of the People’s Republic of China, 2011

Based on domestic experiences, Chinese policymakers recognize health care as a building block for poverty alleviation throughout the Global South.

funds through 2009 went to these regions (Figure 5.3). In Africa, China provides some level of assistance to 48 of the 54 states on the continent.⁵⁰ Although originally propelled by political and social interests, in recent years China's assistance programs in Africa have been largely driven by economic development concerns. In 2000, China showcased its growing commitment to Africa by launching FOCAC. The Forum's aim is to coordinate and promote economic collaboration across the continent, and it holds major summits with heads of government every three years.⁵¹ FOCAC helps China engage African partners on key economic and political priorities. The Chinese government has also strategically used FOCAC summits to announce foreign assistance commitments to the region that build goodwill.

These types of approaches have led to some criticism that China is tying its assistance to domestic economic interests. As part of China's philosophy of mutually beneficial development projects, the government often requires recipients to source procurement from Chinese firms. It appears that China has, at times, also required Chinese labor to be used on infrastructure development projects.⁵² However, these policies are not unique to China. US regulations often require that aid programs use American technologies and food supplies.⁵³ While opinions differ, Chinese policymakers view its approach as a straightforward way to create win-win programs and build more equal development partnerships.

China does not currently have a central agency for foreign assistance and its programs are overseen by a number of government ministries. The Ministry of Commerce (MOFCOM) is the primary coordinating body, responsible for the formulation of assistance policies, regulations and project management.⁵⁴ MOFCOM works closely with the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Health (MOH), provincial governments and the Export-Import Bank on

decision-making and implementation. To enhance inter-agency coordination, MOFCOM recently launched a collaboration mechanism to enable development of strategic assistance policies across government bodies.⁵⁵ As its assistance spending continues to grow, China could likely benefit from having a dedicated development agency for their work in Africa and other areas.

China's Health Assistance

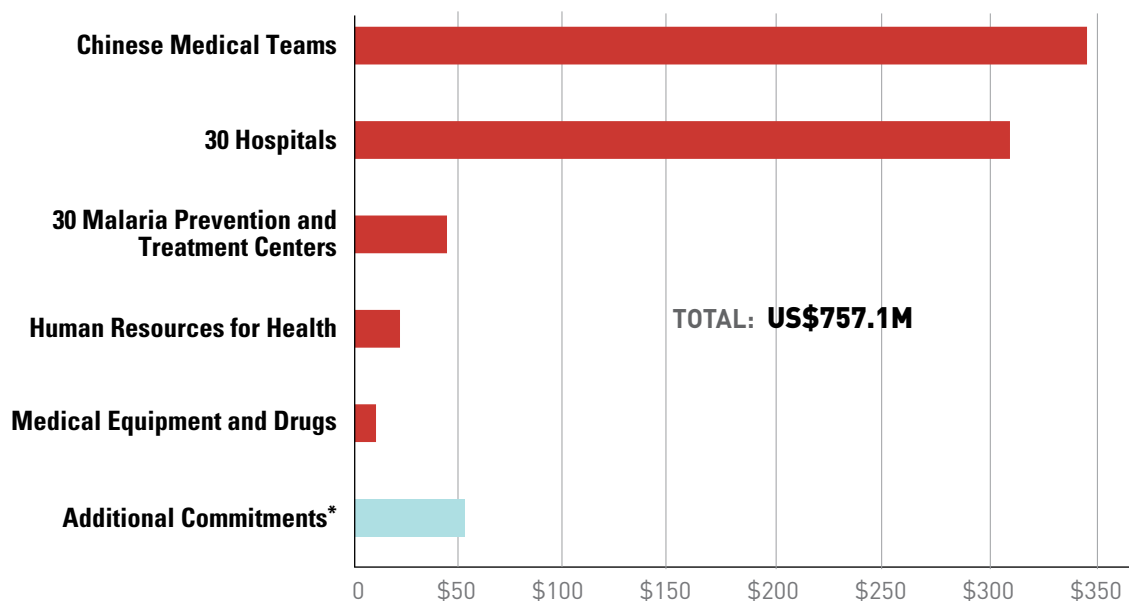
Funding for health comprises a limited amount of China's total foreign assistance spending. However, based on domestic experiences, Chinese policymakers recognize health care as a building block for poverty alleviation throughout the Global South.⁵⁶ With this in mind, China has employed health assistance as a soft power tool to engage other developing countries, particularly in Africa.⁵⁷ This assistance is provided largely through bilateral channels and focuses on health infrastructure, human resources development and, increasingly, malaria control. At the policy level, China has played a critical role advancing regional discussions around public health preparedness and disease surveillance, particularly around influenza and emerging infectious diseases.

MAJOR TRENDS IN HEALTH ASSISTANCE

China's initial work in global health was driven by the same ideological factors that guided the country's early foreign assistance program. In 1963, China sent a medical team abroad to Algeria to provide services in the aftermath of the country's war of independence.⁵⁸ This was the first time China deployed medical professionals overseas. However, since then, international medical teams have become a consistent component in China's foreign assistance program — and a source of pride for the Chinese government.

More recently, China's leadership has come to see global health engagement as a "mutually beneficial" tool similar to other areas of foreign

5.4 ESTIMATED CHINESE HEALTH ASSISTANCE TO AFRICA 2007-2011 (USD Millions)



Source: China Health Aid to Africa, Liu Peilong, Guo Yan, Li Anshan, Ding Xuhong, Yang Haomin, 2011

Note: *Additional commitments made in 2009 for malaria activities across all categories; USD:RMB currency conversion based on IMF annual average exchange rates

assistance. By helping to improve health in developing countries, Chinese policymakers feel they can have health impact and help build political and economic alliances. This approach has led some experts to argue that Chinese health assistance is often driven by an interest in securing access to natural resources and economic markets.⁵⁹ Yet Chinese policymakers do feel that their country has resources and critical expertise to share with other, poorer countries given its perceived domestic success in improving health care with limited resources.⁶⁰

An example of China's complex approach to assistance is malaria. China has in the last two decades prioritized malaria treatment within its health assistance programs. Malaria is also a key policy platform of the FOCAC.⁶¹ China has supported malaria programs in some form for more than 30 years, but these efforts increased after 1993 when the WHO approved Cotecxin, an artemisinin-based antimalarial medicine. Artemisinin, a key antimalarial, is derived from a native-Chinese plant and has been used in

traditional Chinese medicine for centuries. By improving access to Cotecxin, the Chinese government could help African communities combat malaria while bolstering the Chinese pharmaceutical industry. In 1996, all Chinese medical teams were required to use Cotecxin.⁶²

China has also played a prominent role in South-South cooperation around reproductive health. In 1997, China joined Partners in Population and Development (PPD), an initiative launched at the 1993 International Conference on Population and Development to facilitate South-South partnerships.⁶³ Since joining PPD, China has hosted a number of conferences, consultations and trainings on family planning and reproductive health. The Chinese government — in coordination with provincial family planning committees — has also donated reproductive health technologies and helped to build family planning clinics, particularly in Africa.^{64,65} While some of China's domestic reproductive health policies have met with significant criticism, the country does not seek to impose any policies on recipient countries.

BILATERAL ASSISTANCE FOR HEALTH

The majority of Chinese health assistance is provided through bilateral channels and is focused primarily on Africa. The Chinese government does not release annual reports on its programs, so it is difficult to quantify annual health assistance. However, it is estimated that China committed approximately US\$757.1 million in health assistance to Africa between 2007 and 2011 (Figure 5.4). Chinese bilateral health assistance has also traditionally fallen into a few major categories:

CHINESE MEDICAL TEAMS

Chinese medical teams have been a critical element of Chinese health assistance since the 1960s. Medical teams are typically made up of 15-25 physicians, laboratory technicians and assistants who provide free medical care in recipient countries. They are often sent to communities that lack access to health care and provide services to the community and train local medical staff to build capacity.^{66,67} China also deploys medical teams to assist in disaster relief efforts; they were among the first medical aid teams to arrive after the 2003 earthquakes in Algeria and Iran, and after the 2005 tsunami in Southeast Asia.⁶⁸ Through 2009, the Chinese government reports sending more than 21,000 medical workers to 69 countries worldwide.^{69,70}

MALARIA SUPPORT

As noted, China supports a variety of malaria programs in Africa and in 2005 it pledged to increase this assistance.⁷¹ Based on its own experience in combating the disease — as well as its interest in promoting artemisinin therapies — China developed programs for malaria control

At the 2006 FOCAC Summit, the Chinese government announced US\$37.6 million in grants for 30 malaria treatment centers and antimalarials. In 2009, China announced an additional US\$73.2 million to support malaria programs and other facilities across the continent.

and treatment within the FOCAC framework.⁷² At the 2006 FOCAC Summit, the Chinese government announced US\$37.6 million in grants for 30 malaria treatment centers and antimalarials. In 2009, China announced an additional US\$73.2 million to support malaria programs and other facilities across the continent.⁷³ The exact current status of many of these projects is unclear, but they do not appear to be integrated with any other global malaria programs.

HEALTH INFRASTRUCTURE

Infrastructure is a key component of all Chinese foreign assistance — including health efforts. By the end of 2009, China had provided assistance to build more than 100 hospitals and clinics in developing countries, primarily in Africa.⁷⁴ China has also helped to supply many developing country health clinics and hospitals with drugs, medical equipment and reproductive health commodities. To help ensure sustainable production of medicines, China has also funded the construction of pharmaceutical factories in Mali, Tanzania and Ethiopia through its health assistance activities.⁷⁵

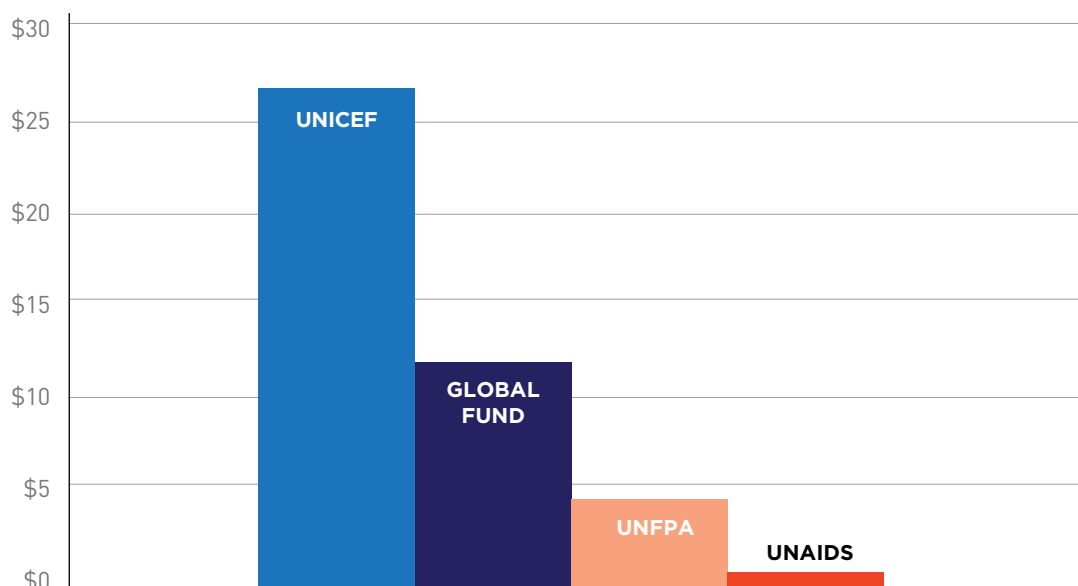
HUMAN RESOURCES FOR HEALTH

China has long expressed its commitment to improving developing countries' health care workforces through training and scholarships. China provides on-the-ground training programs through Chinese Medical Teams or other initiatives. However, China has also traditionally provided scholarships for students from developing countries to study in China.⁷⁶ These short-term training courses allow health care personnel to gain further expertise in topics such as family planning, malaria treatment and prevention, and traditional Chinese medicine. In the lead up to the 2015 MDG deadline, China has emphasized human resources training as a critical area. In 2008, Chinese premier Wen Jiabao announced a five-year program to train 1,000 health care practitioners across Africa.⁷⁷

ASSISTANCE TO HEALTH MULTILATERALS

China has traditionally provided health assistance through bilateral channels, providing limited support to global health multilaterals. However

5.5 CHINA CONTRIBUTIONS TO KEY HEALTH MULTILATERALS, 2005-2010 (USD Millions)



Source: UNICEF; UNFPA; UNAIDS; Global Fund

it has consistently supported UNICEF, WHO and most visibly, the Global Fund (Figure 5.5).

In 2003, China began to build a strong relationship with the Global Fund — as both a recipient and, to a much smaller extent, a donor. Since then, China has received US\$587 million from the Fund, making it one of the largest recipients of grants. Over the same period, it has donated US\$20 million.⁷⁸ In 2011, China doubled its steady US\$2 million commitment and pledged to further increase its annual commitment in 2012 and 2013.⁷⁹ China has also been active on the Fund's board.

Recently, however, China's engagement with the Fund has been overshadowed by controversy. In 2011, the Fund froze payments to China due to financial irregularities and concerns that disbursements were not being channeled appropriately to civil society organizations.⁸⁰ It became an opportunity for critics to argue that China was too rich to deserve additional support. Although funds were reinstated a few months later, China was cut off again in 2012 when — facing severe funding shortfalls — the Global Fund cancelled future grants to middle-

income countries.⁸¹ Importantly, the Chinese government announced it would use domestic resources to cover Global Fund commitments — a decision lauded by UNAIDS and other international HIV/AIDS groups. It is still unclear whether the Global Fund's new policies around middle-income countries will impact China's donations to the organization.⁸²

In recent years, China has also increased its commitments to WHO, particularly since Margaret Chan became Director-General. Dr. Chan served as Hong Kong's Director of Health during the 2003 SARS outbreak, and the Chinese government strongly supported her candidacy for Director-General in 2006.⁸³ The government committed US\$8 million to her campaign, which included an intense three months of canvassing and relationship building with various UN officials.^{84,85} In January 2012, WHO's Executive Board nominated Dr. Chan for a second term, which is now pending approval by the World Health Assembly.⁸⁶

Over the last decade, China has also demonstrated leadership within regional organizations around public health and disease

surveillance.⁸⁷ After the SARS epidemic, China began to strengthen collaboration with countries across Asia to confront the threat of borderless health emergencies like avian and human influenza. China identified health — and particularly the management of public health emergencies — as a key priority for collaboration with the ASEAN. China has also worked with the other countries in the Greater Mekong Subregion to institutionalize disease surveillance.⁸⁸

China has also helped to drive global dialogue around TB — particularly drug-resistant TB. China has one of the world's largest burdens of TB and one-third of all global multidrug-resistant (MDR) cases.^{89,90} In 2009, China hosted a WHO Ministerial Meeting of High Multi/Extensively Drug-Resistant (M/XDR) — TB countries that drew senior-level participation from 31 nations.⁹¹ Based on the outcomes of the meeting, China put forward a resolution on prevention and control of M/XDR TB that was adopted at the 2009 World Health Assembly.

While China's engagement with multilaterals continues to expand, some bilateral programs remain isolated from similar programs supported by other countries and global health agencies. Greater coordination with multilateral mechanisms could therefore be useful to maximize the impact of China's contributions.

Chinese Innovation and Implications for Global Health

China's government is currently investing enormous resources in science and technology with the goal of catalyzing more domestic R&D and accelerating the country's transition from manufacturer to innovator.⁹² There also continues to be high amounts of foreign investment in Chinese industries and facilities.⁹³ Given the sheer scale of industry in China and the financial resources available, this is expected to have significant global impact in areas ranging from clean energy to transportation to health.

In terms of health specifically, Chinese public and private vaccine manufacturers are widely expected to begin entering the global market soon, further reducing prices and improving access in developing countries.⁹⁴ This impact could extend to other health care technologies such as diagnostics and family planning commodities. While government investments prioritize domestic needs, a number of international organizations are working with Chinese institutions to direct their research toward tools and strategies that could benefit other developing countries.⁹⁵ To be successful, however, these institutions will need to overcome lingering concerns about the quality of their products, as well as significant cultural and systemic barriers that have often kept them from pursuing international markets.⁹⁶

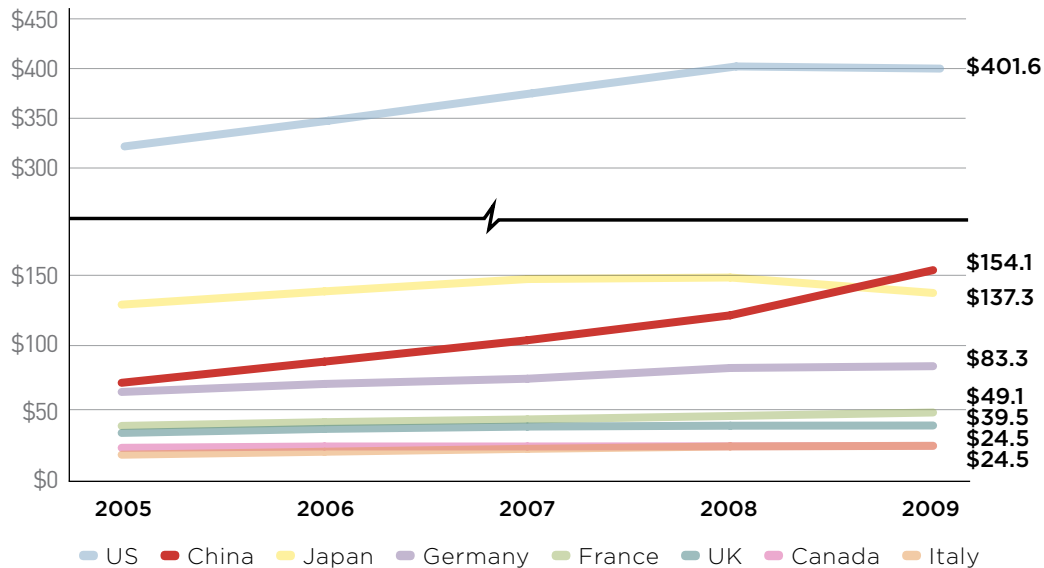
KEY TRENDS IN HEALTH INNOVATION

The Chinese government is the largest source of domestic funding for science and technology. Over the last decade, the government has rapidly increased its investments in R&D through both public and private entities.⁹⁷ Government R&D spending has grown by 20% every year for the past decade and in 2009, China surpassed Japan to become the world's second-largest investor in R&D after the US (Figure 5.6). In 2012, government expenditures on science and technology are expected to reach US\$36.1 billion, a 12.4% increase on 2011 spending.⁹⁸ Although R&D budgets are soaring, the government has also emphasized the need for scientific capacity building, specifically around innovation. In 2011, Chinese Premier Wen Jiabao announced that the central government was aware of the country's "insufficient scientific and technological innovation capabilities," adding that the Chinese economy needs to be put on a path of internally driven growth, "driven by innovation."⁹⁹

To accomplish this goal, China has, among other strategies, developed 16 "mega projects" in 11 focus areas. Two of these "mega projects" focus on health specifically:

- 1) Control and prevention of infectious diseases
- 2) Drug innovation and development¹⁰⁰

5.6 CHINA VS. G7: GROSS DOMESTIC SPENDING ON R&D (USD Billions)



Source: OECD, Main Science and Technology Indicators, 2011

These “mega projects” are supported by 500,000 skilled personnel at nearly 4,000 research institutes funded by the government, with resources totalling US\$6.3 billion annually.¹⁰¹

In the meantime, China’s biopharmaceutical and medical technology sectors, which include private, semi-private and state-owned enterprises, already produce a variety of health products for the domestic market. These include vaccines, low-cost family planning technologies, drugs and diagnostics. China’s active pharmaceutical ingredients (API) industry is one of the largest drivers of growth across China’s biopharmaceutical sector, along with traditional Chinese medicines and supplements. In 2005, China’s API market was nearly US\$5.7 billion and it has been growing rapidly at rate of 15-19% per year.¹⁰² API accounts for 84% of China’s pharmaceutical exports.¹⁰³ However, quality concerns — and an abundance of counterfeiting — continue to affect global perceptions of China’s API industry.¹⁰⁴

In terms of vaccines, Chinese manufacturers have historically supplied most of the products needed for the national immunization program,

and the government tends to be their major — if not only — customer.¹⁰⁵ The industry currently produces domestic versions of almost every vaccine available elsewhere in the world, with the exception of the HPV vaccine and IPV.¹⁰⁶ Yet most companies have never focused on producing vaccines for global customers. At the same time, the government purchases vaccines for the national program at fixed prices, which provides limited profit margins and stagnates innovation.¹⁰⁷

With growing competition in the domestic market, Chinese biopharmaceutical manufacturers have begun to look at global markets with increasing interest. However, there are a number of systemic challenges that inhibit scale-up for international production. Many Chinese manufacturers are not familiar with WHO prequalification or UN agencies’ procurement programs.¹⁰⁸ In addition, many Chinese manufacturers do not have the English-language capabilities of their counterparts in India. This puts Chinese manufacturers at a disadvantage because English is the working language of most UN agencies and is required for negotiations and bureaucratic approval processes.¹⁰⁹

The MOST is working to supply manufacturers with guidelines to accelerate preparations for global markets. At the same time, a number of international organizations, including the Gates Foundation, FHI 360 and PATH, are working with Chinese health care technology companies to build knowledge and capacity and connect their innovative potential with major global health needs.

KEY INNOVATION CASE STUDIES

HEALTH “MEGA PROJECTS”

China’s MOST has invested more than US\$1.3 billion in two health “mega projects,” focused on drug development and infectious disease control and prevention.¹¹⁰

The drug discovery “mega project” has three specific goals to achieve by 2020:

- 1) Identify, verify and produce new chemical and biopharmaceuticals
- 2) Increase domestic capacity to test drug safety and efficacy
- 3) Develop new Chinese traditional medicines¹¹¹

The emphasis is on drugs to combat NCDs, and specific areas of focus include cancer, cardiovascular disease, neurodegenerative diseases, diabetes and mental illness.

The infectious diseases “mega projects” is focused on control and treatment of HIV/AIDS, hepatitis B and C, and TB. Funding is being channeled toward the development of new vaccines, pharmaceuticals and diagnostics, as well as new prevention and treatment standards based on traditional and Western medicine.¹¹² Through the project, China hopes to independently develop 40 types of unique diagnostic reagents and 15 vaccines to address infectious diseases.¹¹³

GATES FOUNDATION/MOST MEMORANDUM OF UNDERSTANDING

In 2011, the Bill & Melinda Gates Foundation forged a partnership with the Chinese MOST that aims to leverage China’s technical expertise

and resources to advance global health and agriculture. Under the partnership, the Gates Foundation and MOST will work to identify and co-fund projects that:

- Promote R&D around new products that will have meaningful impact on alleviating poverty globally
- Accelerate the translation of project results into products that can be delivered for impact in resource-poor countries
- Mobilize public and private sector support to address the needs of resource-poor countries

Initial priorities are likely to include innovations in human and animal vaccines and R&D for new technologies to combat TB and other infectious diseases. Eligible projects will promote availability of new data and information to the scientific and development communities, and ensure that resulting products benefit the needs of developing countries.

While specific financial commitments by partners have not been finalized, funding is expected to total at least US\$300 million. The MOST will match the foundation’s financial contribution on a minimum 2:1 basis, meaning China’s contribution is expected to be around US\$200 million.

The partnership established operations in the first quarter of 2012 and the Gates Foundation and MOST expect to begin funding and managing projects by the end of 2012.

CHINESE VACCINES MANUFACTURERS

China is home to one of the largest and fastest growing vaccine industries in the world, with an annual production of more than 1 billion doses.¹¹⁴ As previously noted, Chinese vaccine companies largely provide vaccines to the Chinese immunization program, and have not traditionally pursued global customers.¹¹⁵ It is clear, however, that there is enormous potential. In 2009, in the face of a potential global health emergency, a Chinese manufacturer produced the first effective pandemic H1N1 vaccine in just 87 days, beating companies from the US and Europe.¹¹⁶

Chinese vaccines are generally high-quality, but the country has historically lacked the regulatory capacity to ensure they meet international standards. Like Indian biopharmaceuticals, Chinese companies have also suffered from a reputation for producing substandard products.¹¹⁷ However, in March 2011, WHO formally recognized the Chinese SFDA as a functional regulatory body for vaccines.¹¹⁸ The validation of China's primary regulatory agency means that Chinese vaccine companies can now apply for WHO prequalification and eventually sell to the large global public market through groups like the GAVI Alliance and UNICEF.

The Chinese government is taking steps to maximize this opportunity to compete internationally. Immediately following the announcement, the SFDA established strict regulations on quality and manufacturing, and the government is working with companies to get up to standard by set deadlines.¹¹⁹ Manufacturers have been forced to invest significant time and resources to comply with these criteria. China National Biotech Group (CNBG), for example, announced that it planned to invest about US\$10 billion in upgrades.¹²⁰ Due to the investment involved, China still doesn't have any WHO prequalified vaccines. However, two vaccine companies have submitted applications — one for a seasonal flu vaccine and another for a Japanese Encephalitis (JE) vaccine.¹²¹

Given the extent to which Indian vaccine manufacturers have driven down prices and helped expand access in poor countries, the entry of Chinese manufacturers in the global market could have significant impact. This theory is borne out by previous efforts. For more than 20 years, China has been vaccinating its children against JE with a vaccine produced by Chengdu Institute of Biological Products, a subsidiary of CNBG.¹²² The vaccine is administered in one dose, which makes it particularly appropriate for use in low-resource settings. Recognizing this, the Gates Foundation and PATH have provided technical and clinical trial support to expand manufacturing, link the company to the global market, and prove the vaccine's safety and effectiveness.¹²³ As a result, the vaccine has been introduced in India — as of 2010, more than 130 million children had been

immunized — and by the end of 2010 it had been registered in nine countries.¹²⁴ Chengdu has built a new manufacturing facility to enable production for GAVI-eligible countries and, as previously noted, it has applied for WHO prequalification.¹²⁵ Many expect the JE vaccine to be China's first prequalified product.

Chinese vaccine manufacturers are also already engaged in partnerships focused on other global health challenges. CNBG recently announced a partnership with the Aeras TB Vaccine Foundation to conduct research on a novel TB vaccine. The partnership will cover every aspect of product development — from preclinical research to clinical development.¹²⁶ In addition, CNBG and Wuhan Institute of Biological Products are working closely with PATH to manufacture a new rotavirus vaccine for use in developing countries.¹²⁷

SINO-IMPLANT (II)

China has long been a leader in producing high-quality, low-cost family planning technologies, in order to support its domestic family planning policies. By 1995, the government had already built more than 40 factories to produce these technologies, and was supporting production with more than US\$30 million annually.¹²⁸

In 2007, the non profit Family Health International (now FHI 360) — with funding from the Bill & Melinda Gates Foundation — partnered with Shanghai Dahua Pharmaceutical Co. to accelerate global access to Sino-implant (II), a low-cost, highly effective injectable contraceptive implant. Once inserted, Sino-implant (II) works for up to four years with 99% effectiveness, dramatically reducing the risk of unwanted pregnancy when compared to alternative contraceptive methods, including condoms and oral contraceptives.¹²⁹ At US\$8, Sino-implant (II) is significantly more affordable than Western-produced alternatives, which average around US\$18.¹³⁰

By February 2012, more than half a million units of Sino-implant (II) had been procured for global use under the Gates-funded initiative. Impact-modeling indicates that Sino-implant (II)'s introduction is already benefiting the health of women and their families. The units are estimated

to have provided 2 million couple-years of protection from pregnancy, and have prevented 562,000 unintended pregnancies, 2,200 maternal deaths and 107,000 abortions worldwide.¹³¹

FHI 360 estimates that if just 20% of sub-Saharan African women already using oral or injectable contraceptives switched to implants, they could prevent 1.8 million unwanted pregnancies annually.¹³² The organization is currently helping Dahua negotiate mutually beneficial contracts with global public sector and nonprofit partners in the hopes of guaranteeing long-term access.¹³³ As of November 2011, Sino-implant (II) had been registered in 20 countries and was under review in an additional 10.^{134,135}

In addition, PATH has partnered with Shanghai Dahua Medical Apparatus Company around

mass production of a next-generation Woman's Condom. (Shanghai Dahua Medical Apparatus Company and the Sino-implant (II) manufacturer were once part of the same state-owned company but are now separate entities.) Under the agreement, PATH licensed Dahua to manufacture and distribute the product, which was developed in Seattle at PATH's product development headquarters. Dahua was selected because of its ability to rapidly produce significant quantities of the Woman's Condom at a low cost. The product has received Shanghai Food and Drug Administration and European CE approval, and in March 2011, it was submitted for WHO prequalification. The aim is to make the Woman's Condom available throughout China and sub-Saharan Africa, and to eventually work toward global access.¹³⁶ 

6 SOUTH AFRICA



South Africa, the newest member of the BRICS, officially joined the group in 2010. While its economy is significantly smaller than any of its BRICS counterparts, it has the largest economy in Africa and is the only African member of the G20. Following the end of apartheid in 1994, South Africa made a notably smooth transition to democracy and reengaged with the rest of the world. Since that time, the country's economy and political influence have grown substantially. It is the gateway to Africa's commodity markets and home to a rapidly expanding middle class, and its vibrant civil society is seen as a model for the rest of the continent. However, its international efforts are nascent and nowhere near the scale of the other BRICS. South Africa is also wrestling with growing income inequality and major social challenges, including the world's largest burden of HIV/AIDS. Taken as a whole, South Africa's history and regional influence give the country a unique political and moral authority among developing countries — but it is currently prioritizing domestic affairs.

ECONOMIC LANDSCAPE

South Africa's economy has grown steadily since the end of apartheid and, following a decade of stabilization, economic growth reached almost 5% each year from 2004 through 2007. This increased growth was largely due to a global commodities boom, which boosted exports to US\$91 billion in 2008 — 33% of GDP — and helped reduce public debt to half its 1994 level.¹ At the same time, GDP per capita (PPP) has steadily increased from US\$6,800 in 2000 to US\$10,800 in 2010.² Following the global financial crisis, South Africa's economy slipped into recession for the first time in 17 years. However, a stable banking system and short-term stimulus from the FIFA World Cup brought growth back to 2.84% in 2010.³

South Africa's economy is driven by its services industry and extensive mineral resources. It is currently among the top five global producers of diamonds, coal, chrome and manganese. Its mineral resources make South Africa an important and attractive trading partner, particularly to China. Bilateral trade between the two countries exceeded US\$25 billion in 2010, more than ten times 1998 levels.⁴

Yet South Africa is still struggling to overcome major challenges. The global economy remains sluggish, undercutting demand for mineral resources.⁵ At the same time, electricity shortages, aging infrastructure, and the human and financial costs of HIV/AIDS are taking their economic toll. Growth aside, unemployment and

poverty remain entrenched in South Africa: at least a quarter of the population is out of work and almost half lives on less than US\$2 a day.^{6,7}

DOMESTIC POLITICS AND FOREIGN AFFAIRS

As its economy has grown, South Africa has played a more prominent role in global politics. In addition to the G20, South Africa is a member of the WTO and has increased ties with the OECD. While South Africa does not yet belong to the OECD, they have agreed to “enhanced engagement,” which could lead to future membership.⁸ South Africa also holds a regional leadership position in the Southern African Development Community (SADC) and is a member of the IBSA trilateral.⁹

Under President Jacob Zuma, South Africa’s foreign policy is heavily influenced by domestic socio-economic challenges. Since his election in 2009, Zuma has worked to strengthen relationships with countries like China and Brazil, seeking trade and investment that generates growth and creates jobs.¹⁰ South Africa’s influence with other countries is closely linked in turn to its economic partnerships. Trading partners view South Africa as a gateway to other African countries, while other countries across the continent use South Africa to access emerging markets.

Beyond economic priorities, the Zuma administration takes a restrained, non-interventionist approach to foreign relations that differs from the pursuit of pan-African prominence by his predecessor, former President Thabo Mbeki.¹¹ Although the current government promotes stability through regional conflict resolution and anti-poverty initiatives, Zuma appears to prefer not to be seen as a regional mediator and honors the autonomy of other African countries.

DOMESTIC HEALTH LANDSCAPE

South Africa’s domestic health landscape is defined by its decades-long battle with HIV/AIDS and the related TB epidemic, which together account for nearly 42% of all mortality in the

country.¹² It is the only one of the BRICS with a higher burden of infectious diseases than NCDs, such as diabetes, cardiovascular disease and cancer (Figure 6.1).

The country’s HIV/AIDS epidemic is the largest in the world; approximately 5.6 million people, or one-fifth of the population, are currently living with the infection. Fueled by HIV, there are half a million cases of TB each year. TB accounts for the majority of HIV-related deaths and drug-resistance is a major and growing problem.¹³

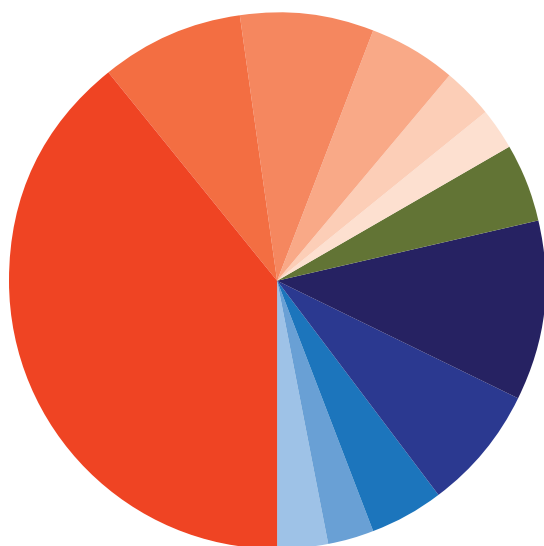
South Africa has increasingly taken steps to curb these twin epidemics. Efforts to combat HIV/AIDS in the early 2000s were undercut by controversial debates around the disease under Mbeki’s administration. However, following a hard-fought battle by HIV/AIDS activists, the government implemented a policy of universal access to HIV/AIDS treatment in 2003.¹⁴ In 2009, President Zuma took this initiative a step further and announced a groundbreaking program to accelerate access to HIV prevention, treatment and care, including treatment for all HIV-positive infants under the age of one.¹⁵

South Africa currently maintains the largest state-funded ARV program in the world, and in March 2012 it announced plans to test and treat hundreds of thousands of miners afflicted by TB. The government has also ramped up funding for health innovation through the Department of Science and Technology, which often partners with South Africa’s private sector on HIV/AIDS and TB research.¹⁶ Despite this progress, however, the national health system is over-burdened and unable to keep pace with demand, and HIV/AIDS control efforts continue to be hampered by a lack of financial and human resources.

South Africa provides basic health services, including HIV/AIDS treatment, largely for free. The country is spending more money on health per capita (US\$860 per person) than China (US\$310) or India (US\$130).¹⁷ This includes significant health assistance from donor countries. The scale of the investment, however, belies the state of the country’s health infrastructure and patient outcomes, and there is massive “brain drain” of skilled health personnel.

6.1 SOUTH AFRICA LEADING CAUSES OF DEATH, 2008

TOTAL: 670,000 DEATHS



COMMUNICABLE DISEASES AND MATERNAL AND CHILD HEALTH CONDITIONS

- HIV/AIDS
- All Other
- Respiratory Infections
- Diarrheal Diseases
- TB
- Perinatal Conditions

NON-COMMUNICABLE DISEASES

- Cardiovascular Diseases
- Cancers
- All Other Non-Communicable Diseases
- Diabetes
- Respiratory Diseases

INJURIES

- Injuries

Source: WHO Global Burden of Disease, 2008

There are also increasing numbers of private health care providers that offer fee-for-services care to middle- and high-income individuals that can afford them.

Current health disparities in South Africa have led the government to revisit health care delivery, resulting in the announcement of two large-scale initiatives: the reengineering of the primary health care system and the introduction of a national health insurance scheme (NHI). The NHI will be piloted in select districts in 2012 and fully rolled out over the course of the next decade; if successful, it could inject billions of dollars into the health care system.¹⁸

South Africa's Foreign Assistance

Since the end of apartheid in 1994, the central tenet of South African foreign policy has been

the promotion of development and stability in Africa. Over the last 18 years, more than 95% of the country's foreign assistance has gone to other African nations. This approach, combined with the fact that South Africa is by far the largest economy on the continent, has helped it build regional influence.¹⁹ Yet at the same time, South Africa's foreign assistance program is small compared to the other BRICS due to its smaller economy and because the government is focused on the country's own internal development challenges.

TRENDS IN FOREIGN ASSISTANCE

South African foreign assistance dates back to the late 1960s, when the apartheid government began to use assistance as a tactic to win votes at the UN and temper international criticism of its regime.²⁰ After the transition to democracy in 1994, the South African government worked to transform its foreign assistance program into a vehicle for promoting positive social and economic change across the continent.

In 2001, South Africa established the African Renaissance and International Co-operation Fund (ARF), administered by the Department of Foreign Affairs (now the Department of International Relations & Cooperation), to replace the country's apartheid-era bureaucracy, the Development Assistance Program.²¹ The term "African Renaissance" was coined by then-President Thabo Mbeki, who believed the fall of apartheid signaled a new era of growth and prosperity across Africa.²² Mbeki also believed that South Africa could lead this renaissance, and sought to bolster his country's profile through initiatives like the New Partnership for Africa's Development, an AU program to promote socio-economic development.

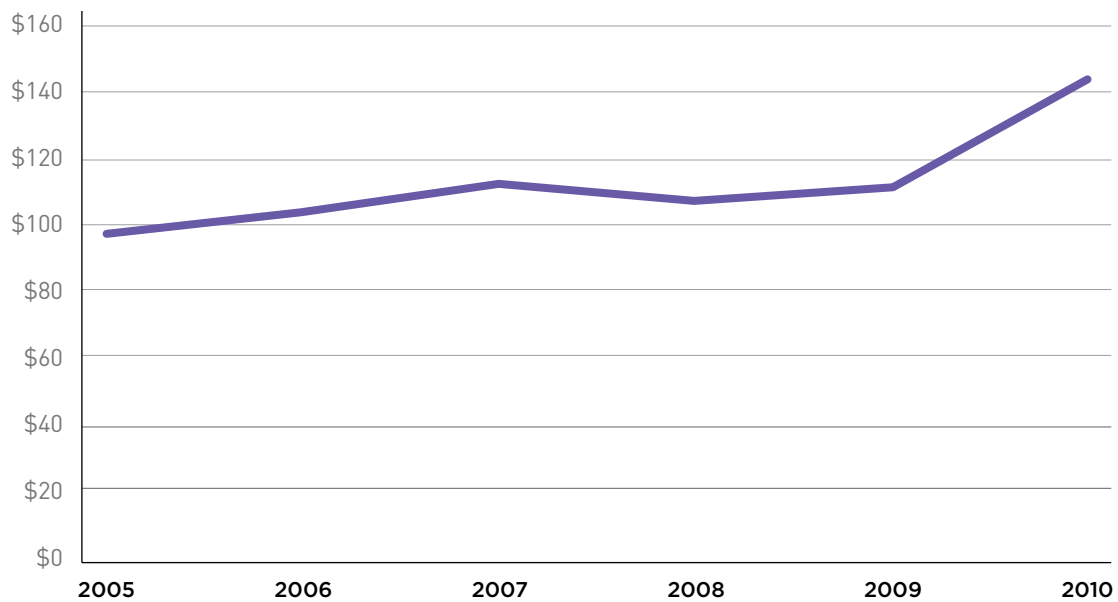
Today, the majority of South Africa's foreign assistance efforts continue to focus on the African continent. Goals include peacekeeping and regional stability in Southern Africa, democracy promotion, and the advancement of African interests internationally. Development assistance is also used as a foreign policy tool to enhance

South Africa's regional influence. With this in mind, the South African government tries to avoid being labeled as a "donor country." Instead, foreign assistance programs are promoted as partnerships established in the spirit of South-South cooperation.

CURRENT FOREIGN ASSISTANCE PROGRAM

Although South Africa itself receives significant foreign assistance, the scope of its international efforts is growing. Estimates currently value the ARF at between US\$79 million and US\$105 million, around six times the level of 2006 funding.^{23, 24} Total development assistance is roughly estimated to be at least US\$143 million because while the ARF sets the agenda for South Africa's development-related activities, several other government bodies — including the Department of Defense and Department of Education — also fund foreign assistance programs.²⁵ However, South Africa only tracks

6.2 ESTIMATED SOUTH AFRICA FOREIGN ASSISTANCE (USD Millions)



Source: J. Waltz, V. Ramachandran, *Brave New World: A Literature Review of Emerging Donors and the Changing Nature of Foreign Assistance*, Center for Global Development, 2011; World Bank Open Data; GHSi Analysis

Note: Estimates based on limited data and GHSi analysis

— Low Estimate

ARF disbursements and it is difficult to quantify overall assistance across all programs, so this number may still be low.

To deliver funds, South Africa channels most of its development assistance through multilateral agencies, such as the SADC, the AU and the Southern African Customs Union. The country has also been exploring opportunities to work through trilateral partnerships like IBSA. Like many of its BRICS counterparts, South Africa prefers to support technical assistance and co-financed projects.²⁶ Recent examples include funding to the Seychelles for infrastructure rehabilitation and to the Republic of Guinea to boost rice production.²⁷

South Africa has also been working to create a centralized agency to coordinate its foreign assistance. The South African Development Partnership Agency (SADPA) is scheduled to launch in April 2012 and will be housed within the Department of International Relations and Cooperation.²⁸ The SADPA will be the country's first mechanism for consolidating and tracking all foreign assistance activity across all departments.²⁹

South Africa's Health Assistance and Impact on Global Health Innovation

South Africa's significant domestic challenges and ongoing battle against HIV/AIDS and TB have limited the scope and influence of its global health assistance program. Despite rapid economic growth and a policy of universal access to HIV/AIDS treatment, the South African health system faces significant funding gaps and only 56% of those in need receive adequate access to ARVs.³⁰ The government has understandably chosen to prioritize domestic health over support for health in other countries.

That said, South Africa's response to HIV/AIDS and TB has had broad influence on global health, particularly in terms of clinical research, advocacy and policy. Since it is on the front lines

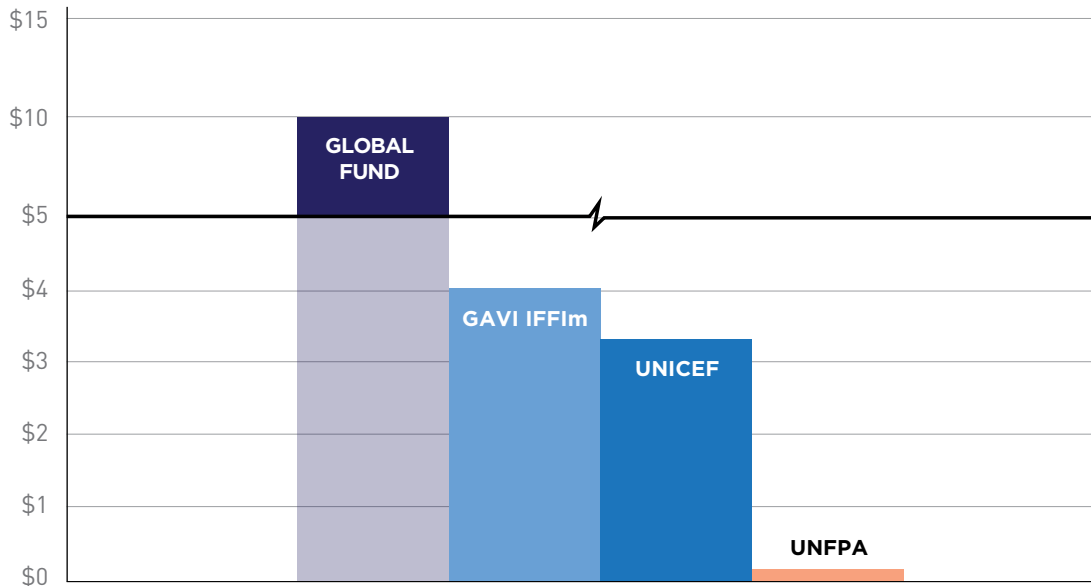
South Africa's response to HIV/AIDS and TB has had broad influence on global health, particularly in terms of clinical research, advocacy and policy. Since it is on the front lines of efforts to combat these epidemics, South Africa has also become a proving ground for innovative tools and programs and produced a cadre of dedicated researchers and policymakers whose efforts impact global approaches to treatment and prevention.

of efforts to combat these epidemics, South Africa has also become a proving ground for innovative tools and programs and produced a cadre of dedicated researchers and policymakers whose efforts impact global approaches to treatment and prevention. While a significant amount of R&D and programming conducted in South Africa is funded or led by international institutions, domestic scientists, innovators and volunteers are major contributors to these efforts. With all this in mind, South Africa's greatest contribution to global health innovation may be its ability to serve as a prominent model for other developing countries.

SOUTH AFRICA'S GLOBAL HEALTH ASSISTANCE

South Africa receives far more health assistance than it contributes, including more of the US President's Emergency Plan for AIDS Relief (PEPFAR) funding than any country in the world.³¹ However, South Africa does allocate limited resources to health assistance through multilateral agencies, bilateral channels and other South-South partnerships. From 2003 to 2007, the Mbeki administration gave US\$10 million to the Global Fund and in 2006 it pledged US\$20 million over 20 years to the GAVI Alliance (Figure 6.3). The current government continues to collaborate on health-related initiatives through IBSA, including a partnership with India on vaccine research in the areas of HIV/AIDS, TB and malaria.³²

6.3 SOUTH AFRICA CONTRIBUTIONS TO KEY HEALTH MULTILATERALS, 2005-2010 (USD Millions)



Source: Global Fund; GAVI Alliance; UNICEF; UNFPA

Note: South Africa has pledged additional US\$16 million to GAVI IFFIm from 2011-2031

South Africa's bilateral health assistance tends to be distributed in the form of grants or technical support, but it makes up just a small part of the broader South African development program. In 2010, for example, South Africa provided technical support to aid malaria control efforts in the SADC region.³³ As in its broader foreign assistance program, health-specific disbursements occur across several government agencies and comprehensive data on expenditures is largely unavailable.³⁴ However, as South Africa's health situation improves — and dependence on foreign assistance declines — many expect the country to seek out more opportunities to expand health assistance efforts across the region.³⁵ For the time being, these programs are expected to remain limited.

GLOBAL IMPACT OF SOUTH AFRICA'S HEALTH POLICY AND ADVOCACY

In recent years, South Africa's high disease burden, moderate resources and energetic civil society have led to the implementation

of aggressive health programs and novel technologies in the hopes of saving lives. Following the successful results of the CAPRISA 004 study, for instance, South Africa has moved quickly to prepare for the potential introduction of tenofovir gel as an HIV prevention method. This push has accelerated research and global regulatory timelines.

At the same time, on World TB Day 2011, South Africa's Minister of Health Aaron Motsoaledi announced plans for national rollout of GeneXpert, a next-generation molecular TB diagnostic. Molecular TB diagnostics have the potential to revolutionize global TB control because they are relatively easy to use, reduce the time it takes to detect the disease from days to hours, and can accurately screen for the most common forms of drug-resistance. This is particularly important given South Africa's high rates of TB/HIV co-infection and drug-resistant TB. Yet national scale-up will require an investment of hundreds of millions of dollars over several years, and South Africa's commitment is

by far the most aggressive that any country has made to rolling out molecular diagnostics for TB.

South Africa's early adoption of these tools and approaches — should they prove effective — could influence other high-burden countries. Along similar lines, South Africa's health activist community has provided inspiration and models that have helped to shape the international response to HIV/AIDS. Internationally known organizations like the Treatment Action Campaign (TAC) and AIDS Law Project (now Section 27) played an important role in advocating for broader access to affordable ARVs and health care services in South Africa — pushing both the South African government and international donors to respond more aggressively to AIDS. As noted above, in 2003, a coalition of these advocacy groups helped force the South African government to announce a policy of universal access to HIV/AIDS treatment. This set a significant precedent for other high-burden countries.

TAC, formed in 1998, boasts more than 16,000 members across South Africa. TAC has publicly pressured the global pharmaceutical industry to make ARVs affordable for developing countries, played a key role in combating AIDS denialism in South Africa, and fought to ensure that South African women received the drug zidovudine to prevent mother-to-child HIV transmission during pregnancy. In 2004, TAC was nominated for a Nobel Peace Prize in recognition of its global influence on the battle against HIV/AIDS.³⁶

SOUTH AFRICAN HEALTH INNOVATION

Due to its well-established clinical infrastructure, high prevalence of HIV/AIDS and TB, and local expertise, South Africa is a hub for R&D and clinical research focused on infectious diseases. Research institutes, including the Desmond Tutu AIDS Centre at the University of Cape Town, the Perinatal HIV Research Unit at the University of the Witwatersrand, and the just-launched KwaZulu-Natal Research Institute for Tuberculosis and HIV, have contributed to a broad range of impactful studies. While much of this research is backed by scientists and funding from

Due to its well-established clinical infrastructure, high prevalence of HIV/AIDS and TB, and local expertise, South Africa is a hub for R&D and clinical research focused on infectious diseases.

the US and Europe, the South African government and its research community have played an equally important role.

The South African government has also sought to catalyze domestic innovation targeting its major health challenges. Overall, South African investment in R&D has increased steadily alongside its growing economy, rising from US\$864.9 million, or 0.73% of GDP, in 2001 to US\$2.6 billion, or 0.93% of GDP, in 2008.³⁷ The government hopes to increase this to 2% of GDP by 2018.³⁸ The South African Department of Science and Technology (DST) directly funds some of this research across disciplines, including basic research, clinical research and public health projects. Translational research focused on new products is funded by the Technology Innovation Agency (TIA; see below), which sits within DST. TIA supports work at governmental organizations, academic institutions, private enterprises and innovative public-private partnerships.

DST-funded public health initiatives include programs like the South African TB Research and Innovation Initiative (SATRII), which specializes in TB diagnostics, testing and treatment. Other government institutions such as the National Research Foundation (NRF) and Medical Research Council (MRC) help universities boost research capacity in the areas of HIV/AIDS and TB. The NRF also sponsors training programs in drug discovery and provides grants to up-and-coming researchers. In 1999, the MRC partnered with a consortium of local and international stakeholders to establish the South African AIDS Vaccine Institute, which coordinates the development and testing of HIV vaccines and has conducted clinical trials for international and domestically produced vaccine candidates.³⁹

KEY EXAMPLES OF SOUTH AFRICAN CONTRIBUTIONS TO HEALTH INNOVATION

Technology Innovation Agency (Health R&D):

Launched in 2010, the TIA was formed through the merger of several smaller funding agencies within the DST with the goal of promoting innovation in health, biotechnology, agriculture and other areas.⁴⁰ The TIA, which started with a budget of US\$54 million, actively funds multiple health R&D initiatives, including a new Drug Discovery and Development Centre, and it has supported several clinical research trials, including the CAPRISA 004 study.

Centre for the AIDS Program of Research in South Africa (HIV Microbicides):

At the 2010 AIDS Conference in Vienna, CAPRISA, an institute based at the University of KwaZulu-Natal, released the results of the CAPRISA 004 study, which found that a vaginal gel containing the ARV tenofovir could prevent HIV transmission in women during sex. This provided the first proof-of-concept that ARV-based microbicides and ARV-based HIV prevention more broadly could significantly reduce the risk of infection.⁴¹ CAPRISA and its partners conducted the study with funding from the TIA, US Agency for International Development (USAID) and others. Designed and led by South African researchers, the CAPRISA 004 study is widely regarded as a landmark in global efforts to develop HIV prevention methods that women can initiate themselves.

Orange Farm Clinical Trial (Male Circumcision):

In 2005, a clinical trial sponsored by the French AIDS Research Agency and conducted in Orange Farm, a large township outside of Johannesburg, found for the first time that male circumcision protects men against HIV infection.⁴² Since then, circumcision has been proven to reduce men's risk of contracting HIV by more than half, prompting high-burden countries from Botswana to Kenya to promote the procedure as an effective means of prevention.

Biovac (Vaccine Production): In 2001, the DST committed more than US\$50 million to catalyze growth in South Africa's health biotechnology sector, which focuses on the production of vaccines and biogenerics, therapeutics, diagnostics and medical devices. Two years later, the Department of Health and a group of local and international stakeholders launched the Biovac Institute to develop and manufacture vaccines at affordable prices. Biovac is currently the largest vaccine distributor in South Africa and hopes to become a full-fledged manufacturer by 2013. The institute supplies all eight of the vaccines that comprise South Africa's Expanded Program of Immunization and also supplies vaccines to Namibia, Botswana and Swaziland.⁴³

PRIVATE SECTOR INNOVATION

South Africa's private health technology sector is small, but the country is home to regional manufacturing and distribution centers for many global pharmaceutical companies. In 2009, more than 70% of sub-Saharan Africa's annual pharmaceutical production took place in South Africa. There are also several local companies that specialize in producing competitively priced generic drugs, including first-line ARVs.

In 2003, South Africa-based Aspen Pharmacare developed Africa's first generic ARV and has since obtained licenses to develop tenofovir and other ARVs for local and regional markets.⁴⁴ In 2009, GlaxoSmithKline acquired a 15% stake in Aspen Pharmacare in hopes of strengthening its commercial presence in sub-Saharan Africa.⁴⁵ Durban-based Cipla Medpro Ltd., a subsidiary of India's largest pharmaceutical company, is also one of the fastest growing pharmaceutical companies in South Africa and an important domestic provider of ARVs. Expanded, local generic production has the potential to further reduce ARV prices in South Africa and across the region. ●



7 BEYOND BRICS

Looking beyond the BRICS, there are a number of other countries that can have — or are already having — significant impact on global health. These include the remaining members of the G20, the Gulf States, and ‘frontier markets’ in Latin America, Asia, Africa and Eastern Europe. While some of the BRICS are larger or their programs better known, these countries may soon play a more substantial role in improving health in developing countries through assistance programs and pharmaceutical, financial or policy innovation.

This section takes a brief look at some of these countries, including a select group of Gulf States (Saudi Arabia, Kuwait, Qatar and the United Arab Emirates), Indonesia, Mexico, South Korea, and Turkey. These countries, as well as other emerging donors, offer very different approaches to foreign assistance, as well as a range of resources and expertise. Each brief profile includes some key country characteristics and highlights some of their existing or potential contributions to global health.

THE GULF STATES

Of the countries profiled in this section, the Gulf States — particularly Saudi Arabia, Kuwait and the United Arab Emirates (UAE) — have the most developed foreign assistance programs. Each has also recently made substantial contributions to global health multilaterals.

These three countries have been providing aid for 35 years or more, with an average assistance level of 1.5% of GNI — more than double the

While some of the BRICS are larger or their programs better known, these countries may soon play a more substantial role in improving health in developing countries through assistance programs and pharmaceutical, financial or policy innovation.

UN recommended 0.7% — since 1973.¹ At the same time, bilateral assistance, which makes up 87% of their assistance, is significantly higher than the 70% from OECD-DAC countries.² The Gulf States generally coordinate their donations among themselves and with regional multilateral organizations through a Coordination Group housed at the Arab Fund for Economic and Social Development.³ Though not official members, all three countries report on their aid to the DAC.⁴

The majority of bilateral assistance from Saudi Arabia, Kuwait and the UAE goes to infrastructure

The Gulf States contribute to regional multilateral institutions such as the Islamic Development Bank, which has begun to put a greater focus on health and education.

development, with a limited amount dedicated to social sector projects related to education and health.⁵ However, all three countries have provided significant funding to health multilaterals over the past decade. Saudi Arabia and Kuwait have pledged US\$53 million and US\$4.5 million, respectively, to the Global Fund.^{6,7} All three countries have donated to GPEI, led by Saudi Arabia, which contributed US\$15 million in 2011 and pledged an additional US\$15 million for 2012.^{8,9} Members of these countries' royal

families have also made personal commitments to global health. In 2011, His Highness Sheikh Mohamed bin Zayed Al Nahyan, the crown prince of Abu Dhabi, pledged US\$50 million toward polio eradication in Pakistan and Afghanistan.¹⁰ He also pledged an additional US\$33 million to the GAVI Alliance from 2011 to 2013 and US\$10 million to the eradication of guinea worm from 2012 to 2015.^{11,12} Beyond these commitments, the Gulf States contribute to regional multilateral institutions such as the Islamic Development Bank, which has begun to put a greater focus on health and education.¹³

Qatar is another potentially significant donor in the Gulf region. In 1995, its Emir chartered the Qatar Foundation to aid the country's transition into a knowledge economy.¹⁴ Although the

7.1 BRICS ECONOMIC AND HUMAN DEVELOPMENT INDICATORS*

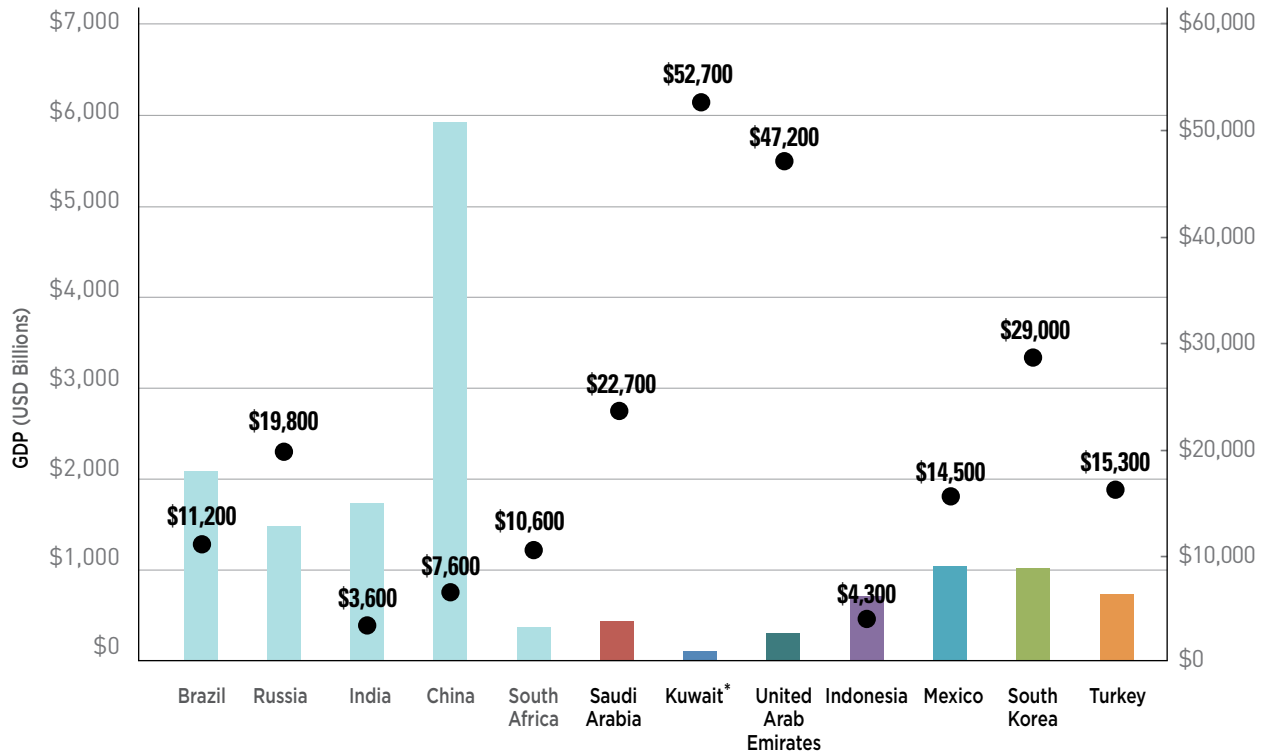
Indicator	Year	Beyond BRICS							Other Leading Economies	
		Kuwait	Saudi Arabia	United Arab Emirates	Indonesia	Mexico	South Korea	Turkey	United States	Japan
Population, total	2010	2,736,000	27,448,000	7,512,000	239,870,000	113,423,000	48,875,000	72,752,000	309,052,000	127,450,000
Reserves of Foreign Currency and Gold and Rank	2010	US\$28.0B 53	US\$556.2B 4	US\$55.3B 31	US\$136.2B 19	US\$142.0B 18	US\$306.4B 9	US\$96.1B 24	US\$132.4B 20 (2010)	US\$1.1T 2 (2010)
Life expectancy at birth (years)	2009	74.5	73.6	76.4	68.5	76.5	80.3	73.4	78.1	82.9
Literacy rate, adult total (% of people ages 15 and above)	-	93.9 (2009)	86.1 (2009)	90.0 (2005)	92.2 (2008)	94.0 (2009)	-	90.8 (2009)	-	-
Income inequality measured by GINI coefficient**	-	-	-	-	36.8 (2009)	51.7 (2008)	31.6 (1998)	43.2 (2005)	45.0 (2007)	37.6 (2008)
CO ₂ emissions (kt)	2008	77,000	434,000	155,000	406,000	476,000	509,000	284,000	54,561,000	1,208,000
Mobile cellular subscriptions (per 100 people)	2010	160.8	187.9	145.5	91.7	80.6	103.9	84.9	90.2	94.7
Health expenditure per capita, PPP (constant 2005 international \$)	2009	US\$1,500	US\$1,150	US\$1,760	US\$100	US\$850	US\$1,800 (2008)	US\$950	US\$7,400	US\$2,700

Source: World Bank Open Data; CIA World Factbook

Note: *World Bank and CIA World Factbook indicators were used over local sources to allow for cross-country analysis;

**The higher the GINI coefficient, the larger income inequality

7.2 BRICS VS. BEYOND BRICS: GDP AND GDP PER CAPITA (USD Billions, USD)



Source: World Bank Open Data

Note: *Most recent GDP Nominal and GDP per capita PPP indicators for Kuwait were from 2009 and 2007, respectively; World Bank indicators were used to allow for cross-country analysis

■ GDP Nominal (USD Billions)
● GDP Per Capita, PPP (USD)

The country's pharmaceutical industry has been singled out as an area for investment as Turkey continues to move toward EU membership. The goal is for Turkey to develop into a major exporter of brand name and generic drugs.

TURKEY

Turkey is the 17th-largest global economy by nominal GDP, and it had an 8.9% GDP growth rate in 2010.^{19,20} The country sits at the physical and political crossroads of Europe, Central Asia and the Middle East, and — alongside the size of its economy — this gives Turkey a measure of influence in all three regions.

foundation is not currently focused on health efforts, it has invested billions of dollars into state-of-the-art research, education and technology centers, emphasizing domestic and regional growth.¹⁵ In 2010, the Qatari government also established a Qatar Development Fund modeled after agencies in Saudi Arabia, the UAE and Kuwait, and it has begun regional food security and energy projects through the Fund.^{16,17,18}

The Turkish government sees assistance as both a foreign policy tool that can help drive stability in the region, and as an economic tool for increasing exports to burgeoning “Southern” markets.²² Turkey has maintained a foreign assistance program since 1985. In 2010, Turkey disbursed US\$967 million, focused primarily on activities in Central Asia but also in the Middle East, Africa and Latin America.^{23,24,25} Turkey’s foreign assistance focuses primarily on education in recipient

countries, but its 2010 budget included US\$68 million for basic health, water and sanitation projects. This included small commitments for GPEI.^{26,27}

Beyond government funded foreign assistance, Turkey's pharmaceutical industry also has significant potential to impact global health. The country's pharmaceutical research and development has been singled out as an area for investment as Turkey continues to move toward EU membership. The goal is for Turkey to develop into a major exporter of brand name and generic drugs.²⁸ Turkey's domestic pharmaceutical market, ranked 12th in the world in 2009 with US\$10.4 billion in sales, helps to justify this investment. In 2006, IMS Health named Turkey — along with the BRICS, South Korea and Mexico — as a 'Pharmerging Market' with significant potential for growth.²⁹

INDONESIA

With 200 million citizens, Indonesia is the world's fourth most populous country, behind China, India and the US.³⁰ While the country still receives significant amounts of assistance, it has been a leader in health assistance policy. In the 1960s, Indonesia was one of the founders of the "non-aligned" movement, which, through the Bandung Conference, laid the groundwork for greater South-South collaboration.³¹ In 2006, Indonesia was also a co-founder of the Foreign Policy and Global Health initiative, and a signatory of the resulting Oslo Ministerial Declaration on Global Health and Foreign Policy that advocated for the integration of global health assistance into foreign policy discussions.³²

At the same time, Indonesia is having direct impact on global health through its state-owned vaccine company, Bio Farma....The company exports millions of doses of vaccines annually, including sending approximately 1.4 million doses of its oral polio vaccine to India.

Bandung Conference

The Bandung Conference, which took place in Indonesia in 1955, is considered the birthplace of the concept of South-South collaboration. The conference was convened to promote geopolitical solidarity among a group of African and Asian states in response to the rising influence of the US and the Soviet Union during the Cold War. The 29 attending countries, which included India and China, discussed mechanisms to minimize inequalities in global power relations. Participants also pledged to lessen their dependence on wealthy countries by providing technical assistance to one another for development projects.

At the same time, Indonesia is having direct impact on global health through its state-owned vaccine company, Bio Farma. The firm produces 15 WHO pre-qualified vaccines, including low-cost vaccines for hepatitis B, polio, tetanus, measles and DTP.³³ The company exports millions of doses of vaccines annually, including sending approximately 1.4 million doses of its oral polio vaccine to India.³⁴ Indonesia has also reinstated its National Vaccine Research Forum with a goal of developing a new set of vaccines for diseases like dengue and avian flu.³⁵

Indonesia is leveraging innovative partnerships with international organizations to support domestic health — and it has the potential to influence other countries to do the same. Indonesia is one of three recipient country participants in the Global Fund's Debt2Health program, in which Germany and Australia have agreed to waive debt owed in exchange for Indonesia paying 50% of that debt to Global Fund-approved programs in the country.^{36,37,38} To date, Indonesia has directed roughly US\$22 million to health through this program.³⁹ The Global Fund's recent decision to make Indonesia ineligible for TB funds, which have historically comprised more than 40% of the country's total Global Fund receipts, may impact this program.^{40,41}

Another major source of funding for health in Latin America is the privately operated Carlos Slim Health Institute, a division of the Carlos Slim Foundation based in Mexico City. Supported by a US\$500 million donation from Mexican billionaire Carlos Slim, the Institute focuses on maternal and child mortality and NCDs.

MEXICO

Mexico has the second largest economy in Latin America, and the 14th largest globally by nominal GDP.⁴² This year Mexico also serves as President of the G20, and the country will host the annual G20 Summit in June 2012.

In terms of public sector foreign assistance, the Mexican government focuses its efforts on bilateral development aid within Latin America on a wide range of subjects, including health.⁴³ Currently, Mexico is working to streamline its foreign assistance program by developing formal tracking systems and creating a central agency to manage its efforts.^{44,45} That agency, the Mexican International Development and Coordination Agency, is chairing the preparatory meetings for the 2012 G20 Summit.⁴⁶

Another major source of funding for health in Latin America is the privately operated Carlos Slim Health Institute, a division of the Carlos Slim Foundation based in Mexico City. Supported by a US\$500 million donation from Mexican billionaire Carlos Slim, the Institute focuses on maternal and child mortality and NCDs.⁴⁷ It operates throughout Latin America and the Caribbean and has a strong focus on in-house development R&D.⁴⁸ The Institute is also a primary funder — alongside the Gates Foundation and the Spanish government — of the Mesoamerican Health Initiative, a US\$142 million program administered by the Inter-American Development Bank. The

initiative focuses on maternal and child health in Central America, specifically among the lowest income quintile.⁴⁹

Beyond funding for global health, Mexico's pharmaceutical industry also has strong potential for impact. Mexico is home to the state-owned vaccine company Birmex, a "prospective full member" of the Developing Country Vaccine Manufacturing Network.⁵⁰ Birmex only produces vaccines for national use, but the company intends to boost production and expand into the global market.⁵¹ Alongside other low-cost manufacturers, this could further increase global vaccine supply and drive down prices. Birmex currently produces vaccines for polio, tetanus and diphtheria, as well as antitoxins and antivenoms. It also has avian flu, rubella, and Hib vaccine candidates in development.⁵²

SOUTH KOREA

South Korea has long been considered an economic power in Asia, and it currently has the 15th largest economy worldwide by nominal GDP.⁵³ South Korea is also a significant source of foreign assistance, and is the only country to officially transition from OECD-DAC recipient to donor.⁵⁴ In 2010, South Korea provided US\$1.2 billion to assistance programs, an increase of 55% since 2006 and 440% since 2001.^{55,56} The country aims to again double its foreign assistance levels, from 0.12% of GNI in 2011 to 0.25% by 2015.⁵⁷ South Korea also uses its voice to influence assistance policy globally and in November 2011 it played host to the Global Aid Effectiveness Forum at Busan.⁵⁸

South Korean organizations have also had specific impact on global health through their work on vaccines. IVI, based in Seoul, is the only international organization working exclusively on vaccine development for developing countries.

South Korea's overall assistance programs focus heavily on economic infrastructure. However, in 2010, it provided US\$136 million in health assistance.⁵⁹ South Korea has also contributed to several global health multilaterals, including providing an annual contribution of US\$2 million to US\$3 million to the Global Fund and a US\$1 million pledge to the GAVI Alliance over three years.^{60,61} United Nations Secretary-General Ban Ki-moon, a native of South Korea, is also a known champion for global health, including on women's and children's health and polio eradication efforts.⁶²

South Korean organizations have also had specific impact on global health through their work on vaccines. IVI, based in Seoul, is the only international organization working exclusively on vaccine development for developing countries.⁶³

IVI has been instrumental in research and development efforts targeting diarrheal, respiratory and neglected viral diseases. With funding from the Gates Foundation, it developed the leading cholera vaccine Shanchol, manufactured by Shantha Biotech in India, and focused global efforts against typhoid fever.⁶⁴ In addition to providing a state-of-the-art headquarters for IVI, South Korea is by far the organization's largest government funder, supplying US\$5.7 million, 25% of IVI's budget, in 2010.⁶⁵ South Korea is also home to LG Life Sciences, which announced in 2011 that it would work with WHO and governments and organizations in the Netherlands, China and India to produce a lower-cost, easier-to-produce inactivated polio vaccine that could decrease the incidence of vaccine-derived poliovirus.⁶⁶ ●



8 KEY FINDINGS AND CONCLUSIONS

The expanding influence of the BRICS is impacting global economics, politics and culture — and health is no exception. While growth in the BRICS has recently begun to slow, they have shown much greater resilience than the US and Europe in the face of the global financial crisis, and their foreign assistance spending has been increasing at very high rates.

Beyond direct assistance, the BRICS are investing considerable time, money and energy building their capacity for science and technology. Through platforms like the BRICS forum, they are also exploring opportunities for more formal collaboration among themselves and with other developing countries.

Below are some key findings from our research that highlight areas where the BRICS are already contributing new global health resources and models. We also suggest some opportunities for the BRICS to potentially use their experiences and expertise to have impact in areas beyond those where they are already visibly contributing. This could be through assistance, innovation, or policies and programs that can be emulated in other countries.

While our conclusions focus on the BRICS specifically, many of these comments could easily be extended to include other emerging leaders, such as those highlighted in the “Beyond BRICS” section of this report.

The BRICS are all established providers of foreign assistance; however their contributions have increased significantly over the last five years.

The BRICS are often referred to as “emerging” or “non-traditional” donors, but each has been providing different levels of assistance to other countries for decades. As the US and Europe have slowed donor spending, the BRICS’ assistance programs have become much more prominent. The funding involved is still relatively small when compared to overall spending by the US and Western European countries. China is by far the largest contributor, and South Africa is likely the smallest by a significant margin. However, in recent years the growth in their assistance spending has accelerated. Between 2005-2010, Brazil’s assistance spending grew by 20.4% annually, India’s by 10.8% annually, China’s by 23.9% annually, and South Africa’s by 8% annually. Russia’s assistance increased substantially early in the same period, before stabilizing at around \$450 million per year.

BRICS: FOREIGN ASSISTANCE AND GLOBAL HEALTH

Indicator	Brazil	Russia	India	China	South Africa
Launch of Foreign Assistance Program	1960	1955	1964	1950	1968
Estimated Absolute Foreign Assistance (2010)	US\$400M – US\$1.2B	US\$472M	US\$680M	US\$3.9B	US\$143M
Foreign Assistance Estimated Compound Annual Growth Rate (2005 - 2010)	20.4%	36.1%	10.8%	23.9%	8.0%
Central Assistance Agency	Brazilian Cooperation Agency (ABC)	None currently; RUSAID launch currently on hold	Development Assistance Partnership (oversees administration); central agency to launch in 2012	None currently; MOFCOM manages majority of assistance projects	None currently; South African Development Partnership Agency (SADPA) planned
Foreign Assistance Regional Focus	<ul style="list-style-type: none"> Latin America Africa Lusophone countries 	<ul style="list-style-type: none"> CIS region Looking toward Africa 	<ul style="list-style-type: none"> Regional neighbors (i.e. Bhutan, Afghanistan, Nepal) Increasingly looking toward Africa 	<ul style="list-style-type: none"> Africa Asia 	<ul style="list-style-type: none"> Africa
Foreign Assistance Sector Focus	<ul style="list-style-type: none"> Health Education Agriculture 	<ul style="list-style-type: none"> Health Education Food security 	<ul style="list-style-type: none"> Infrastructure Information technology Training and capacity building 	<ul style="list-style-type: none"> Infrastructure Industrial development Energy resources development 	<ul style="list-style-type: none"> Peacekeeping Democracy promotion
Global Health Focus	<ul style="list-style-type: none"> Access to medicines HIV/AIDS Capacity-building/ infrastructure development Social determinants of health 	<ul style="list-style-type: none"> Infectious diseases Disease surveillance NCDs Global Fund 	<ul style="list-style-type: none"> Health infrastructure Health IT Capacity building Medical missions 	<ul style="list-style-type: none"> Medical teams Malaria treatment Health infrastructure Human resources 	<ul style="list-style-type: none"> Limited focus on global health
Key Innovations and Implications for Global Health	<ul style="list-style-type: none"> Government responsible for majority of country's health R&D/innovation to date; transitioning from generics to biotech innovator with emphasis on affordability Private sector contributions limited though government recently increased investment in R&D; private sector recognized as critical to filling existing gap in product development pipeline 	<ul style="list-style-type: none"> Government focused on infectious diseases, particularly HIV/AIDS Academia considered 'Center of Knowledge and Science' for CIS region Private sector contributions limited to date; government investing in capacity around domestic production, innovation 	<ul style="list-style-type: none"> Vaccine industry with most WHO prequalified vaccines; contributes between 60% and 80% of all UN procured vaccines Private sector spurred global access to generic ARVs Public and private sector working on low-cost service provision for poorest of the poor Government investing in innovation around health technologies 	<ul style="list-style-type: none"> Government investing more than US\$1.3B in R&D for drug development, infectious disease control/prevention Government partnering with the Gates Foundation to fund development, production of new low-cost health technologies Robust health manufacturing sector starting to look to global market 	<ul style="list-style-type: none"> Government focused on infectious diseases, R&D and support for clinical/research trials, particularly around HIV/AIDS and TB Government spurring uptake of next-generation health technologies Private sector manufacturing generic ARVs

Brazil and Russia prioritize health within their broader assistance agendas. China, India and South Africa are all contributing to some degree, but their formal programs focus on other issue areas.

The BRICS' foreign assistance programs are also evolving: as assistance spending increases, they are investing time and resources in developing greater capacity and stronger policies. Brazil, Russia, India and South Africa all have or are launching central assistance agencies, although much of Brazil's assistance continues to fall outside ABC's mandate. While China's assistance program involves a variety of government ministries led by MOFCOM, China's 2011 white paper provided a formal, public guidepost for its approach to international development. As the scale of China's assistance efforts grow, a central aid agency could help maximize the impact of its investments. At the same time, across the BRICS, better management systems, more coordination across agencies, and increased monitoring and evaluation will likely be needed.

The BRICS are employing approaches to foreign assistance that are different from traditional donors and shaped by domestic experiences.

The BRICS have made health advances over the past few decades, and BRICS policymakers feel this equips them with unique perspective on improving health outcomes in developing countries. As a result, all of the BRICS except for Russia openly reject "Western" approaches to foreign assistance in favor of models anchored in domestic programs and their own political and social philosophies. For Brazil, this translates into programs that emphasize health equity and draw directly on successful domestic programs such as Bolsa Família. Similarly, Russia is leading efforts to address NCDs because they are having a significant impact on Russia's own population.

Aside from Russia, the BRICS do not like to see themselves as donors. Instead, they see themselves as developing country partners that are sharing best practices and helping other countries build self-sustaining growth. Most BRICS health assistance programs focus on infrastructure, human resources training or health systems strengthening. China provides

The BRICS have made health advances over the past few decades, and BRICS policymakers feel this equips them with unique perspective on improving health outcomes in developing countries.

the most prominent example: its assistance program overtly emphasizes mutually beneficial programs that seek to build long-term economic development. This aligns with China's approach to its own development, which favors infrastructure, investment and market-driven growth — albeit with strict government oversight.

Because the BRICS still face major health and economic challenges, continued investments in global health will likely be made in the context of issues at home. At the same time, the BRICS are likely to have greatest global impact in areas where their own health issues overlap with those of other countries.

As with Western donors, economic and political interests are influencing the BRICS as they expand their development and health assistance programs.

There is no question that BRICS health and development programs and policies are guided by broader strategic priorities. Some of this is arguably for the better: Brazil's emphasis on health equity has guided technical cooperation efforts, while efforts to build health R&D capacity in all five BRICS can also improve access in resource-poor countries. Other approaches have generated criticism: both India and China may tie some assistance to the purchase of domestically produced goods. In all of these cases, the truth is likely more complex than it appears. Indian and Chinese policymakers, for instance, would argue that "mutually beneficial" programs create more equal partnerships. But while "South-South" models of cooperation may prove to be more sustainable, all of the BRICS also use them as tools to build allies and influence among other developing countries.

It is important to note that many traditional donors are influenced by politics and economics.

Between 1970 and 1994, 78% of the UK's bilateral aid and 57% of France's bilateral aid went to former colonies, and the UK recently announced it was refocusing aid on Commonwealth countries. Meanwhile, much US aid is used to procure domestically produced goods and services. Four out of the US Government's five food assistance programs procure their food aid in-country, and the US requires that 75% of its commodities are shipped on US-flag vessels. Rough estimates suggest that in fiscal year 2004 more than 90% of US food aid expenditures were spent in the US.

There are opportunities for the BRICS to have significant health impact in areas that align with their foreign policy priorities. For example, each BRICS country has specific regional interests and influence that could help improve health in neighboring countries. South Africa has focused on stability in Southern Africa, and domestic efforts to combat HIV/AIDS have implications for the whole continent. Russia has sought to maintain its influence in Eurasia, and its investments in regional capacity building and health surveillance have benefitted CIS countries. India has contributed to a range of health programs and policies in South Asia, while China is involved in disease surveillance and emergency preparedness through regional bodies in Southeast Asia. Brazil, meanwhile, has sought to expand its influence and impact in Latin America and the Lusophone countries. While each country has regional political ambitions, their unique spheres of influence provide distinct opportunities to work bilaterally, or with global partners, to improve health in these areas.

Innovative domestic health programs and policies in the BRICS are increasingly influencing health practices worldwide.

The BRICS are all struggling to address high burdens of infectious diseases and/or NCDs, but they also have capacity and resources available for innovative health programming. Many of their health successes and failures are happening in parallel to similar efforts in developing countries, so the BRICS are uniquely positioned to provide relevant models.

Given its small international assistance program, South Africa's influence in global health has

largely been through examples produced in its efforts to combat HIV/AIDS and TB — particularly in recent years as it has strengthened its domestic programs. Similarly, India's low-cost health service delivery programs and recent success interrupting polio transmission offer templates for countries trying to get to the most difficult-to-reach populations. Brazil's commitments to health equity, HIV treatment and nutrition programs have all been recognized as models for success in resource poor countries. And at the same time, the IP battles fought by the Brazilian government, India's public and private sectors, and South African activists have all had broad impact on global treatment access.

The BRICS are taking steps to prioritize health as an essential element of development and foreign policy more broadly, and to coordinate these efforts through the BRICS forum. At their July 2011 Ministers of Health meeting, the BRICS committed "to support other countries in their efforts to promote health for all," although these statements have yet to produce any tangible outcomes. All the BRICS are also asserting a greater role in health governance at WHO and multilaterals like the World Bank.

The production of high-quality, lower-cost health technologies by the BRICS is improving access in resource-poor countries, and the growing investment in early-stage R&D by the BRICS could have a similar long-term impact.

Arguably one of the most impactful examples of BRICS contributions to health is the role that Indian companies have played in expanding global access to vaccines and essential medicines. Between 60% to 80% of the vaccines purchased by the United Nations Children's Fund (UNICEF) for the world's poorest countries come from India, and millions of people living with HIV/AIDS have access to affordable ARVs because of Indian companies. These products have saved millions of lives, though complex legal and IP issues remain unresolved.

While India has long dominated the generic medicines and vaccines industry, China is poised to compete thanks to recent improvements in regulation and quality control. Brazil, Russia

and South Africa are also investing in increased pharmaceutical capacity with the global market in mind. As supply increases, quality improves and prices drop, developing countries stand to benefit.

At the same time, all of the BRICS are investing heavily in science and technology. China, for example, has pledged to increase R&D expenditures to 2.5% of GDP by 2020, while India has just launched a US\$1 billion innovation fund focused on problems afflicting developing countries. Alongside technical and financial support from international organizations, domestic investments have already produced innovations that are improving global health. MenAfriVac and China's work on Japanese Encephalitis (JE) demonstrate the potential for new, affordable vaccines; Chinese reproductive health technologies are beginning to reach other developing countries; and South African HIV/AIDS research drove the successful CAPRISA 004 study.

Some of these innovations have grown out of commercial interests, and others from efforts to address domestic health challenges. Yet because BRICS health challenges are often similar to those in many developing countries, their innovations could quickly reach and benefit populations in need. As the BRICS continue to prioritize innovation, they could expand the supply of health technologies that are appropriate and affordable for developing country settings, while pushing down prices across the globe.

The BRICS have declared health collaboration a priority, but they have not yet begun to work collectively to enhance the impact of their assistance programs.

Despite increased foreign assistance budgets, BRICS investments are still limited compared to those of the US and Western Europe. Collective action could help the BRICS have greater impact, and this was acknowledged at their July 2011 Ministers of Health meeting. There, BRICS Ministers of Health committed themselves to "collaborate in order to advance access to public health services and goods in our own countries and...to support other countries in their efforts to promote health for all."

As the BRICS countries prioritize innovation, they could expand the supply of health technologies that are appropriate and affordable for developing country settings, while pushing down prices across the globe.

To date, there have been no notable joint efforts — although India's proposal that the BRICS create a development bank funded by developing countries could be a step in this direction. By working together to leverage their respective knowledge and experiences, these countries have the potential to do more on health than any could do on their own.

SOME POTENTIAL AREAS FOR IMPACT

With all of the above in mind, independent and collective action by the BRICS could have significant regional and global health impact going forward.

As examples, we suggest a few specific areas where the BRICS could leverage their unique resources and expertise to support global health in ways beyond those where they already have enormous impact. The specific areas below build on existing efforts and on the statements of the BRICS Ministers of Health.

1) Providing political and technical support that accelerates access to life-saving vaccines:

In recent decades, the number of children around the world who receive basic, life-saving vaccines has increased dramatically. In 1980, only 20% of children received DTP vaccines that protect against diphtheria, pertussis and tetanus. Today, approximately 85% receive these vaccines. As noted throughout this report, BRICS countries support global immunization efforts through a wide range of financing, manufacturing, and R&D efforts. Yet despite massive progress, more than 19 million of the world's poorest children still do not receive basic vaccines, and 1.7 million children still die each year from vaccine-preventable diseases.

The BRICS could continue to accelerate global vaccine access efforts in a variety of ways. Most BRICS have high immunization rates and successful programs that can offer lessons learned for other developing countries looking to roll out new vaccines. Brazil and China in particular have prioritized domestic manufacture of essential vaccines. As they continue to scale up production, they may follow India's lead in boosting supply and driving down prices for countries worldwide. India continues to scale up its national immunization program, so it could work to share innovative practices for getting to the hardest-to-reach populations. Meanwhile, continued financial and technical support for multilaterals working on vaccines, such as the GAVI Alliance and UNICEF, could help support global immunization delivery programs.

Newer vaccines cost more to produce than traditional vaccines, so BRICS manufacturers can play a unique role in bringing these prices down further as they increase their capacity. We are already seeing this through international partnerships developing rotavirus vaccines in India, Brazil and China. And as the BRICS increase their investment in innovation and health R&D, there are opportunities to support development of vaccines for diseases where none currently exist, such as TB and HIV/AIDS.

2) Catalyzing access to innovative TB tools and strategies: Each of the BRICS is on WHO's list of high TB-burden countries. India and China alone have 40% of the world's TB, a disease that causes 1.1 million deaths annually. Yet the BRICS also have the resources and innovative potential to provide models of success for others. India helped prove DOTS, and DOTS scale-up in India has been a template used globally. South Africa has already made unprecedented commitments to scale up use of new TB diagnostics, and China, India and Brazil are exploring the same technology. In addition, China and South Africa have helped push TB higher on the global public health agenda.

Widespread implementation of molecular diagnostics in the BRICS could help quickly identify cases and cut the spread of TB off at the source. This would help reduce TB in the BRICS, and provide an evidence base to encourage

other countries to do the same. Collaborative efforts, such as joint purchasing agreements and regulatory harmonization, could also help reduce prices and streamline introduction. Another area where the BRICS could have an impact is on global access to second-line TB drugs, which treat drug-resistant TB but are currently very expensive and in short supply. BRICS manufacturers are uniquely positioned to help produce greater quantities of lower-cost treatments.

The BRICS could also focus on producing low-cost TB diagnostics and vaccines. Global efforts are underway to develop these new TB tools, and the BRICS are already contributing. But additional investment and research is needed, and coordinated research efforts among the BRICS could accelerate results. A jointly hosted meeting on TB innovation could be one way to share best practices and explore opportunities for technical cooperation.

3) Supporting efforts toward polio eradication:

India's recent success on polio gave new momentum to global efforts to eradicate this disease. Since 1989, the number of polio cases globally has dropped 99%, to less than 1,000 in 2011. Yet several countries are still struggling with polio elimination. While India received technical support from a range of global partners, its polio program was almost entirely self-funded, and the country was able to mobilize millions of people to support immunization campaigns.

The October 2011 report of the Global Polio Eradication Initiative's Independent Monitoring Board raised the idea of "twinning," where "a polio-free country would pledge support to a country trying to rid itself of polio." This, the board believed, would create "a more direct and meaningful relationship" than complex multilateral programs. Given their success in eliminating polio, existing links to countries struggling with polio (i.e., Brazil's relationship with Lusophone Angola, India's relationship with Afghanistan), and the risk of regional outbreaks (such as those in Tajikistan and Russia in 2010 and China in 2011), the BRICS are uniquely suited to support coordinated twinning efforts to polio-impacted countries.

In addition, successful polio eradication may require widespread access to an affordable whole-killed polio vaccine, similar to the Salk polio vaccine, which prevents vaccine-derived polio but is currently much too expensive for developing countries. India produces vaccines of this type, and in February 2012 it introduced them in Nigeria's private health care sector. By producing more, cheaper polio vaccines, innovators in the BRICS could play a decisive role in eradicating this disease.

4) Increasing leadership on NCDs and tobacco control:

Rates of NCDs such as diabetes, cancer and cardiovascular ailments — and smoking-related ailments specifically — are rising alongside greater wealth and changes in lifestyle and diet. The full global burden of NCDs is expected to increase by 17% over the next ten years, and developing countries are increasingly at risk. NCDs could cause more deaths in Africa than all other causes combined by 2030.

All of the BRICS except South Africa now face higher burdens of NCDs than infectious diseases, and incidence of NCDs is increasing even as infectious diseases are being brought under control. Russia has one of the world's highest rates of cardiovascular disease, and China and India now have the two highest diabetes burdens. It is estimated that the two countries have a combined 138 million cases of diabetes. Chinese Health Minister Chen Zhu recently went so far as to call NCDs "the number one threat."

As the BRICS invest in measures to control and prevent NCDs, they have a unique opportunity to contribute to efforts in other developing countries. All five countries were active participants in the 2011 UN NCD Summit, and they have committed to inject significant resources and funds into NCD campaigns. Brazil, among others, has been a global leader on tobacco control — including on the 2005 FCTC — and it is likely to continue to support these efforts. Russia convened the first global ministerial meeting on NCDs in 2011, and it has committed US\$35 million to support the global response. In India, the government has strengthened NCD and tobacco awareness efforts, and it is integrating NCD control strategies into improvements in its national health infrastructure.

The BRICS could continue to leverage their domestic experiences combatting NCDs and boosting tobacco control to provide models for education, prevention and diagnosis programs in other countries. Pharmaceutical companies in the BRICS could also play an important role in improving access to medicines for chronic diseases, in the same way that Indian companies have already significantly reduced the price of insulin.

5) Strengthening regional disease surveillance networks:

BRICS efforts to control infectious diseases have led them to develop strong networks for tracking illnesses within their borders. India's recent success on polio would not have been possible without focused surveillance programs, and Russia's surveillance capacity helped curb the 2010 polio outbreak in Tajikistan before it spread much further.

Since many of these surveillance networks have been developed recently, they offer potential lessons learned for other countries. Russia, China and Brazil are already working with neighboring countries to strengthen regional surveillance networks. Russia, for example, has partnered with a number of CIS countries to improve capacity, upgrade antiquated facilities, and train in-country specialists to track diseases like HIV/AIDS and influenza. Russia is also working with multilateral partners to bring best practices in surveillance to countries in Africa. Similarly, following the 2003 SARS outbreak, China strengthened collaboration with countries across Southeast Asia to prepare for and track public health emergencies. Brazil's Health Surveillance Agency has also worked with countries in Africa, Latin America and Asia to share technical knowledge and domestic experiences.

As diseases continue to cross borders, the BRICS could play a powerful role in strengthening these networks in their regions and globally, and work together to establish potential new collaborative mechanisms.

6) Helping to harmonize global regulatory processes:

Many of the BRICS are investing significant resources in ensuring that their respective biopharmaceutical industries meet international regulatory standards. This requires harmonizing their own regulations with those

of WHO to ensure products are eligible for prequalification. In 2011, WHO formally recognized China's SFDA as a functional regulatory body for vaccines. At the same time, a significant portion of Russia's US\$4.4 billion investment in its pharmaceutical industry is focused on helping producers meet GMP standards, and a number of vaccines manufactured by Brazil's Fiocruz are already WHO-prequalified.

Meeting international regulatory standards can open international markets while helping to ensure access to safe, effective medical technologies at home. There are still challenges and quality concerns, and some BRICS regulatory bodies continue to lack the capacity they need to be fully effective. As they move forward, however, there is a significant opportunity to link the BRICS' work in this area with broader efforts on regulatory harmonization.

Working together and with other developing countries, the BRICS could help harmonize technical requirements for medical technologies and use their respective expertise to achieve higher regulatory standards across all partners. This could also help reduce costs and accelerate access to new health products worldwide, since regulatory approval in one country would meet the regulatory standards of others, reducing the need for additional clinical studies.

CONCLUSIONS

Among other shifts, the BRICS and other emerging powers will increasingly influence the

global health agenda. As seen throughout this report, the BRICS' support for foreign assistance is growing. At the same time, the manufacture of low-cost drugs, diagnostics and vaccines across multiple diseases will continue to provide huge benefits to developing countries — as will the BRICS' increased focus on health R&D and innovative programming.

The scale of the BRICS' long-term impact on global health will depend on much broader political and economic trends. Their approaches will also vary from those of traditional donors, and will be shaped by their own experiences, philosophies and interests. However, to maximize their global health investments, the BRICS could consider steps that improve coordination with other countries and each other. These include accelerating the development of dedicated assistance agencies and stronger monitoring and evaluation policies, and improving communication with global multilateral mechanisms.

Like traditional donors, the BRICS countries have their own motives for engaging in global health. And there are, to be sure, reasonable concerns about their role and the effectiveness of their programs. Yet these countries represent a potentially transformative source of new resources and innovation for global health and development. Over the long term, the BRICS can play an increasingly important role in helping to improve the health and well-being of the world's poorest countries. ●

CITATIONS

Brazil

- ¹ Montagne, Renee. "Brazil Outshines Other BRIC Economies." *NPR*. 21 Dec. 2011. Web.
- ² *Open Data*. The World Bank. Web.
- ³ "Brazilian Economy Overtakes UK's, Says CEBR." *BBC*. 26 Dec. 2011. Web.
- ⁴ *Open Data*. The World Bank. Web.
- ⁵ "Country Statistical Profile: Brazil." *OECD iLibrary*. 18 Jan. 2012. Web.
- ⁶ Coppola, Gabrielle, and Ben Bain. "Brazilian Real Strengthens as Inflation-Adjusted Rates Attract Investors." *Bloomberg*. 26 Jul. 2011. Web.
- ⁷ "Brazilian Regulatory Tax Scrapped to Promote Foreign Investment." *Transact Brazil*. Dec. 2011. Web.
- ⁸ "Chinese Investments in Brazil: A new phase in the China-Brazil relationship." *China-Brazil Business Council*. May 2011. Web.
- ⁹ Lemann, Nicholas. "The Anointed." *The New Yorker*. 5 Dec. 2011. Print.
- ¹⁰ *Ibid.*
- ¹¹ "Members and Partners." *OECD*. Web.
- ¹² Jairnilson, Claudia, et al. "The Brazilian health system: history, advances, and challenges." *The Lancet* 377.9779 (2011): 1778-1797. Print.
- ¹³ Victora, Cesar, Mauricio Barreto, and Maria Do Carmo Leal. "Health Conditions and Health-policy Innovations in Brazil: The Way Forward." *The Lancet* 377.9782 (2011): 2042-2053. Print.
- ¹⁴ Bliss, Katherine, Judyth Twigg, and Yanzhong Huang. "Brazil and Russia's Engagement in Global Health." Council on Foreign Relations, New York, NY. 10 Jan. 2012. Roundtable Discussion.
- ¹⁵ *Open Data*. The World Bank. Web.
- ¹⁶ "Brazil: HIV/AIDS Health Profile." *USAID*. Sep. 2010. Web.
- ¹⁷ "Brazil." *Global Health Observatory (GHO)*. World Health Organization. 4 Apr. 2011. Web.
- ¹⁸ *Ibid.*
- ¹⁹ "Free diabetes and blood pressure drugs for Brazilians." *BBC*. 3 Feb. 2011. Web.
- ²⁰ Vaz, Alcides Costa, and Cristina Yumie Aokie Inoue. "Emerging Donors in International Development Assistance: The Brazil Case." *International Development Research Centre*. Dec. 2007. Web.
- ²¹ "Speak softly and carry a blank cheque." *The Economist*. 15 Jul. 2010. Web.
- ²² Vaz, Alcides Costa and Cristina Yumie Aokie Inoue. "Emerging Donors in International Development Assistance: The Brazil Case." *International Development Research Centre*. Dec. 2007. Web.
- ²³ Farani, Marco. Personal interview. 13 Jan. 2012.
- ²⁴ "Brazil as an Emerging Actor in International Development Cooperation: A Good Partner for European Donors." *German Development Institute*. May 2010. Web.
- ²⁵ *Ibid.*
- ²⁶ Vasquez, Karen, et al. "From a fledging donor to a powerhouse." *Columbia School of International and Public Affairs*. 2011. Web.
- ²⁷ "Brazil as an Emerging Actor in International Development Cooperation: A Good Partner for European Donors." *German Development Institute*. May 2010. Web.
- ²⁸ "Speak softly and carry a blank cheque." *The Economist*. 15 Jul. 2010. Web.
- ²⁹ Vaz, Alcides Costa, and Cristina Yumie Aokie Inoue. "Emerging Donors in International Development Assistance: The Brazil Case." *International Development Research Centre*. Dec. 2007. Web.
- ³⁰ "Brazil as an Emerging Actor in International Development Cooperation: A Good Partner for European Donors." *German Development Institute*. May 2010. Web.
- ³¹ Vasquez, Karen, et al. "From a fledging donor to a powerhouse." *Columbia School of International and Public Affairs*. 2011. Web.
- ³² "Brazil." *Global Humanitarian Assistance*. Web.
- ³³ "Brazil as an Emerging Actor in International Development Cooperation: A Good Partner for European Donors." *German Development Institute*. May 2010. Web.
- ³⁴ Cabral, Lídia, and Julia Weinstock. "Brazilian technical cooperation for development." *Overseas Development Institute*. Sep. 2010. Web.
- ³⁵ *Ibid.*
- ³⁶ "Speak softly and carry a blank cheque." *The Economist*. 15 Jul. 2010. Web.
- ³⁷ Cabral, Lídia, and Julia Weinstock. "Brazilian technical cooperation for development." *Overseas Development Institute*. Sep. 2010. Web.
- ³⁸ *Ibid.*
- ³⁹ Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Nov. 2011. Web.
- ⁴⁰ Pimenta, Cristina, et al. "Access to AIDS treatment in Bolivia and Paraguay." *Associação Brasileira Interdisciplinar de AIDS*. 2006. Web.
- ⁴¹ Jairnilson, Claudia, et al. "The Brazilian health system: history, advances, and challenges." *The Lancet* 377.9779 (2011): 1778-1797. Print.
- ⁴² Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Apr. 2010. Web.

- ⁴³ Ministers of Foreign Affairs. "Oslo Ministerial Declaration — global health: a pressing foreign policy issue of our time." *The Lancet* 369.9570 (2007): 1373-1378. Print.
- ⁴⁴ Farani, Marco. Personal interview. 13 Jan. 2012.
- ⁴⁵ Figueiredo, Mauro. Personal interview. 24 Jan. 2012.
- ⁴⁶ Vallini, Juliana. Personal interview. 13 Jan. 2012.
- ⁴⁷ Ferreira, José Roberto, et al. Personal interview. 30 Jan. 2012.
- ⁴⁸ Passarelli, Carlos André, and Veriano Terto Jr. "Good Medicine: Brazil's Multi-Front War on AIDS." *NACLA: Report on the Americas* 35.5 (2002): 35-37, 40-42. Web.
- ⁴⁹ "Brazil: HIV/AIDS Health Profile." *USAID*. Sep. 2010. Web.
- ⁵⁰ Lee, Kelley, et al. "Brazil and the Framework Convention on Tobacco Control: Global Health Diplomacy as Soft Power." *PLoS* 7.4 (2010). Web.
- ⁵¹ Pimenta, Cristina, et al. "Access to AIDS treatment in Bolivia and Paraguay." *Associação Brasileira Interdisciplinar de AIDS*. 2006. Web.
- ⁵² *Ibid.*
- ⁵³ Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Oct. 2009. Web.
- ⁵⁴ Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Nov. 2011. Web.
- ⁵⁵ "Brazil World Bank — Sharing a quiet social revolution." *The South-South Opportunity Case Stories*. Task Team on South-South Cooperation. Web.
- ⁵⁶ "A donation from the heart." *PATH*. Web.
- ⁵⁷ US CDC. "Latin American Breast Milk Banks Catch on Worldwide." *The Body*. 29 Jul. 2008. Web.
- ⁵⁸ "Institutes". *Fiocruz*. 2005. Web.
- ⁵⁹ Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Nov. 2011. Web.
- ⁶⁰ Almeida, Celia, et al. "Brazil's conception of South-South 'structural cooperation' in health." *RECISS* 4.1 (2010): 23-32. Web.
- ⁶¹ Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Nov. 2011. Web.
- ⁶² *Ibid.*
- ⁶³ "UNAIDS and Brazil to strengthen technical cooperation on AIDS." *Feature stories – 2008*. UNAIDS. 30 May 2008. Web.
- ⁶⁴ Ferreira, José Roberto, et al. Personal interview. 30 Jan. 2012.
- ⁶⁵ Brazil. Ministry of Health. International Health Matters Advisory Department. *Health Cooperation: Brazilian International Health Activities Bulletin*. Apr. 2010. Web.
- ⁶⁶ Lee, Kelley, et al. "Brazil and the Framework Convention on Tobacco Control: Global Health Diplomacy as Soft Power." *PLoS* 7.4 (2010). Web.
- ⁶⁷ Ortiz, Fabiola. "Providing Alternatives for Small-Scale Tobacco Farmers." *Inter Press Service*. 23 Dec. 2011. Web.
- ⁶⁸ Almeida, Celia, et al. "Brazil's conception of South-South 'structural cooperation' in health." *RECISS* 4.1 (2010): 23-32. Web.
- ⁶⁹ Brazil. Institute for Applied Economic Research. *Brazilian Cooperation for International Development: 2005-2009*. Nov. 2011. Web.
- ⁷⁰ "How UNITAID came about." *UNITAID*. Web.
- ⁷¹ Rezaie, Rahim et al. "Brazilian health biotech — fostering crosstalk between public and private." *Nature Biotechnology* 26.6 (2008): 627-644. Print.
- ⁷² *Ibid.*
- ⁷³ Serruya, Suzanne, et al. "Research and Innovation in Brazil: The Institutional Role of the Ministry of Health." *Global Forum Update on Research for Health* 5 (2008): 24-27. Web.
- ⁷⁴ Brazil. Ministry of Science, Technology and Innovation. *Brasil: Dispêndios públicos em pesquisa e desenvolvimento (P&D), por objetivo socioeconômico, 2000-2010*. 14 Feb. 2012. Web.
- ⁷⁵ Rousseff, Dilma. "FINEP Innovation Prize Award Ceremony." *Presidential Palace Blog*. 15 Dec. 2011.
- ⁷⁶ *Brasil Maior*. Web.
- ⁷⁷ Chamas, Claudia Ines. "Developing Innovative Capacity in Brazil to Meet Health Needs." *MIHR Report to CIIPIH on Innovation in Developing Countries to Meet Health Needs*. Apr. 2005. Web.
- ⁷⁸ "Neglected Disease Research & Development: New Times, New Trends." *G-FINDER*. The George Institute for International Health. 2009. Web.
- ⁷⁹ "Enhancing Brazil's Capacity for Biopharmaceutical Innovation." *IAVI Insights*. Jul. 2010. Web.
- ⁸⁰ Chamas, Claudia Ines. "Developing Innovative Capacity in Brazil to Meet Health Needs." *MIHR Report to CIIPIH on Innovation in Developing Countries to Meet Health Needs*. Apr. 2005. Web.
- ⁸¹ Serruya, Suzanne, et al. "Research and Innovation in Brazil: The Institutional Role of the Ministry of Health." *Global Forum Update on Research for Health* 5 (2008): 24-27. Web.
- ⁸² Brazil. Ministry of Health. *Pesquisa Estratégica para o Sistema de Saúde*. 2011. Web.
- ⁸³ Brazil. Ministry of Health. *Decit 10 Anos*. 2010. Web.
- ⁸⁴ Gadelha, Carlos. "Valor Economico: Seminar on Perspectives for the Health Sector." 16 Mar 2011.
- ⁸⁵ Chamas, Claudia Ines. "Developing Innovative Capacity in Brazil to Meet Health Needs." *MIHR Report to CIIPIH on Innovation in Developing Countries to Meet Health Needs*. Apr. 2005. Web.
- ⁸⁶ Brazil. CONFAP. *Orcamento*. 2009. Web.
- ⁸⁷ Brazil. Ministry of Health. *Decit 10 Anos*. 2010. Web.
- ⁸⁸ Brazil. Ministry of Health. *Pesquisa Estratégica para o Sistema de Saúde*. 2011. Web.

- ⁸⁹ Rezaie, Rahim, et al. "Brazilian health biotech — fostering crosstalk between public and private." *Nature Biotechnology* 26.6 (2008): 627-644. Print.
- ⁹⁰ *Ibid.*
- ⁹¹ "The Brazilian Life Sciences Industry: Pathways to Growth." *Fundação Biominas and PriceWaterhouseCoopers*. 2011. Web.
- ⁹² Gadelha, Carlos. "Valor Economico: Seminar on Perspectives for the Health Sector." 16 Mar. 2011.
- ⁹³ "O mercado privado de vacinas no Brasil: A Mercantilização no Espaço da Prevenção." *Cadernos de Saúde Pública* 19.5 (2003):1323-1339. Print.
- ⁹⁴ Chamas, Claudia Ines. "Developing Innovative Capacity in Brazil to Meet Health Needs." *MIHR Report to CIPIH on Innovation in Developing Countries to Meet Health Needs*. Apr. 2005. Web.
- ⁹⁵ "History." *Fiocruz*. 2005. Web.
- ⁹⁶ "Introduction." *Fiocruz*. 2005. Web.
- ⁹⁷ Chamas, Claudia Ines. "Developing Innovative Capacity in Brazil to Meet Health Needs." *MIHR Report to CIPIH on Innovation in Developing Countries to Meet Health Needs*. Apr. 2005. Web.
- ⁹⁸ "Fiocruz in Africa." *Fiocruz*. 2005. Web.
- ⁹⁹ "Institutes." *Fiocruz*. 2005. Web.
- ¹⁰⁰ "Bio-Manguinhos." *Fiocruz*. 2005. Web.
- ¹⁰¹ Chamas, Claudia Ines. "Developing Innovative Capacity in Brazil to Meet Health Needs." *MIHR Report to CIPIH on Innovation in Developing Countries to Meet Health Needs*. Apr. 2005. Web.
- ¹⁰² "Center for Technological Development in Health." *Fiocruz*. Web.
- ¹⁰³ "About Us." *Butantan*. Web.
- ¹⁰⁴ Butantan official. Personal interview. 2012.
- ¹⁰⁵ Boseley, Sarah. "Thousands will go untreated unless Brazil steps up production of essential drugs." *The Guardian*. 6 Oct. 2011. Web.
- ¹⁰⁶ "Brazil to become world supplier of Chagas disease drug." *News Medical*. 22 Oct. 2011. Web.
- ⁸ Russia. *State Statistics Service*. Web.
- ⁹ "Russia: Economy Overview." *The World Factbook*. CIA. Web.
- ¹⁰ Mankoff, Jeffrey. *Russian Foreign Policy: The Return of Great Power Politics*. Lanham, MD: Rowman & Littlefield, 2009. Print.
- ¹¹ Bridge, Robert. "As Global Economy Cools, Russian-Chinese Relations Heat up." *Russia Today*. 11 Oct. 2011.
- ¹² *Open Data*. The World Bank. Web.
- ¹³ "Highlights on health in the Russian Federation." *World Health Organization* 2005. Web.
- ¹⁴ "MDG+ Agenda in Russia: Translating Economic Growth Into Sustainable Human Development with Human Rights." *United Nations*. Dec. 2004. Web.
- ¹⁵ Suhrcke, Marc, et al. "Economic Consequences of Noncommunicable Diseases and Injuries in the Russian Federation." *The European Observatory on Health Systems and Policies*. 2007. Web.
- ¹⁶ "HIV/AIDS Policy Framework and Implementation in Russia." *Global Business Coalition on HIV/AIDS, Tuberculosis and Malaria and Transatlantic Partners Against Aids*. 2007. Web.
- ¹⁷ "TB Policy Framework and Implementation in Russia." *Global Business Coalition on HIV/AIDS, Tuberculosis and Malaria and Transatlantic Partners Against Aids*. 2007. Web.
- ¹⁸ Ferris-Rotman, Amie. "Insight: Russia Says No to West's Way with HIV." *Reuters*. 21 Dec. 2011. Web.
- ¹⁹ *Ibid.*
- ²⁰ "HIV/AIDS Policy Framework and Implementation in Russia." *Global Business Coalition on HIV/AIDS, Tuberculosis and Malaria and Transatlantic Partners Against Aid*. 2007. Web.
- ²¹ "Health at a Glance: Europe 2010." *European Commission*. OECD. 1 Dec. 2010. Web.
- ²² *Ibid.*
- ²³ Gamser, Marius. "Putin Talks Russia Health care Reform." *International Insurance News*. 19 Apr. 2011. Web.
- ²⁴ Walz, Julie, and Vijaya Ramachandran. "Brave New World: A Literature Review of Emerging Donors and the Changing Nature of Foreign Assistance." *Center for Global Development*. 2011. Web.
- ²⁵ *Ibid.*
- ²⁶ "Russian Federation - net official development assistance and official aid received." *index mundi*. 1 Mar. 2012. Web.
- ²⁷ Russia expert. Personal interview. Feb. 2012.
- ²⁸ Russia. Ministry of Finance. *Russia's Participation in International Development Assistance, Concept*. 2007. Web.
- ²⁹ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.

Russia

- ¹ "Energy-rich Russia Hit Hard by Global Financial Crisis." *PBS Newshour*. 1 Jul. 2009. Web.
- ² *Open Data*. The World Bank. Web.
- ³ *Ibid.*
- ⁴ *Ibid.*
- ⁵ "Russia's middle class must grow – Putin." *RIA Novosti*. 16 Jan. 2012. Web.
- ⁶ Bierman, Stephen. "Russian Crude Oil Production Rose to Post-Soviet High in 2011." *Bloomberg*. 2 Jan. 2012. Web.
- ⁷ "Russia: Economy Overview." *The World Factbook*. CIA. Web.

- ³⁰ Russia. Ministry of Finance. *Russia's Participation in International Development Assistance, Concept*. 2007. Web.
- ³¹ Walz, Julie, and Vijaya Ramachandran. "Brave New World: A Literature Review of Emerging Donors and the Changing Nature of Foreign Assistance." *Center for Global Development*. 2011. Web.
- ³² "World Bank-Russian Federation Partnership: Country Program Snapshot." *The World Bank*. 2011. Web.
- ³³ "Russia." *The Data Report 2011*. ONE. 1 Mar. 2012. Web.
- ³⁴ Russia. Ministry of Finance. *Deauville Accountability Report G8 Commitments on Health and Food Security State of Delivery and Results The Russian Federation Contribution*. 2010. Web.
- ³⁵ Russia. Ministry of Finance. *Russia's Participation in International Development Assistance, Concept*. 2007. Web.
- ³⁶ "Russia." *Research Centre for International Cooperation and Development*. 1 Mar. 2012. Web.
- ³⁷ Russia. Ministry of Finance. *Russia's Participation in International Development Assistance, Concept*. 2007. Web.
- ³⁸ "Russian Finance Ministry Will Fight Poverty." *Newsru.com*. 26 Aug. 2011. Web.
- ³⁹ Russia innovation and technology expert. Personal interview. Feb. 2012.
- ⁴⁰ Russia. Ministry of Finance. *Russia's Participation in International Development Assistance, Concept*. 2007. Web.
- ⁴¹ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ⁴² Larionova, M. "ODA: forming a new collaboration paradigm." Web.
- ⁴³ World Health Organization official. Personal interview. Feb. 2012.
- ⁴⁴ Russia. Ministry of Finance. *Deauville Accountability Report G8 Commitments on Health and Food Security State of Delivery and Results The Russian Federation Contribution*. 2010. Web.
- ⁴⁵ *Ibid.*
- ⁴⁶ "Government Statements at the UN High-Level Summit on NCDs, 19-20 September 2011." *International Diabetes Federation*. 2011. Web.
- ⁴⁷ Russia expert. Personal interview. Feb 2012.
- ⁴⁸ Russia. Ministry of Finance. *Deauville Accountability Report G8 Commitments on Health and Food Security State of Delivery and Results The Russian Federation Contribution*. 2010. Web.
- ⁴⁹ *Ibid.*
- ⁵⁰ Russia expert. Personal interview. Feb 2012.
- ⁵¹ *Ibid.*
- ⁵² *Ibid.*
- ⁵³ *Ibid.*
- ⁵⁴ Russia. Ministry of Finance. *Deauville Accountability Report G8 Commitments on Health and Food Security State of Delivery and Results The Russian Federation Contribution*. 2010. Web.
- ⁵⁵ "Indicators for Science, Statistical Information." *Higher School of Economics*. 2009. Web.
- ⁵⁶ World Health Organization official. Personal interview. Feb. 2012.
- ⁵⁷ "Indicators for Science, Statistical Information." *Higher School of Economics*. 2009. Web.
- ⁵⁸ Academic official. Personal interview. Feb. 2012.
- ⁵⁹ *Ibid.*
- ⁶⁰ Russia. Ministry of Education and Sciences. *Education of Foreign Citizens in the Higher Educational Institutions of the Russian Federation*. 2011. Web.
- ⁶¹ World Health Organization official. Personal interview. Feb. 2012.
- ⁶² *Ibid.*
- ⁶³ Russia. Ministry of Industry and Trade. *Medical Industry 2009*. 2010. Web.
- ⁶⁴ "Pharmaceutical Market Russia Issue." *Russian Association of Pharmaceutical Manufacturers*. 2011. Web.
- ⁶⁵ "Pharma 2020: The Strategy of Development of the Pharmaceutical Industry of the Russian Federation." *Swiss Embassy in the Russian Federation*. 2011. Web.
- ⁶⁶ "Russian drug first time approved in the US." *RB News*. 25 Feb. 2011.
- ⁶⁷ Russia. Ministry of Industry and Trade. *Medical Industry 2009*. 2010. Web.
- ⁶⁸ "Pharma 2020: The Strategy of Development of the Pharmaceutical Industry of the Russian Federation." *Swiss Embassy in the Russian Federation*. 2011. Web.
- ⁶⁹ "Support for domestic production will not be dominant in the transition Pharmstandard GMP." *Pharma2020*. 27 Apr. 2010. Web.
- ⁷⁰ Peach, Gary. "Russia Pledges \$4 billion for Pharma-2020 plan." *Nature Medicine News*. 5 May 2011. Web.
- ⁷¹ Jerome Gavet. Interview with Focus Reports. *Focus Reports*. 1 Mar. 2012. Web.
- ⁷² "Pharma 2020: The Strategy of Development of the Pharmaceutical Industry of the Russian Federation." *Swiss Embassy in the Russian Federation*. 2011. Web.
- ⁷³ "Our commitment to Russia." *Akrikhin*. 2 Mar. 2012. Web.
- ⁷⁴ "Foreign companies are increasing their levels of investment in Russia." *Pharmaceutical News*. 15 Jul. 2011. Web.
- ⁷⁵ Russia innovation and technology expert. Personal interview. Feb. 2012.

India

- ¹ Narayanan, Dinesh and Udit Misra. "UPA's Inclusive Growth Agenda For India." *Forbes India Magazine*. 25 Feb. 2010. Web.
- ² *Open Data*. The World Bank. Web.
- ³ *Ibid*.
- ⁴ "Economic Survey of India, 2007." *OECD*. Oct. 2007. Web.
- ⁵ "Manufacturing Helps GDP Grow 7.4% in FY10." *Economic Times*. 1 Jun. 2010. Web.
- ⁶ Vaidyanathan, R. "The Real Engines of Indian Economic Growth." *The Edge* 5.1 (2008). Web.
- ⁷ Development expert. Personal interview. Jan. 2012.
- ⁸ "India's economic growth sags to 6.1 percent in December quarter, slowest in over 2 years." *Associated Press*. 29 Feb. 2012. Web.
- ⁹ Swaminathan S. "Economic Survey 29012: GDP growth pegged at 7.6 per cent for FY'13." *Economic Times*. 16 Mar. 2012. Web.
- ¹⁰ Development expert. Personal interview. Jan. 2012.
- ¹¹ "Inflation Hits 26-month Low of 6.55%." *The Times of India*. 15 Feb. 2012. Web.
- ¹² *Ibid*.
- ¹³ Mohan, C. Raja. "India and the Balance of Power." *Foreign Affairs*. Jul-Aug. 2006. Web.
- ¹⁴ "Chinese PM Wen Jiabao Begins Bumper Indian Trade Trip." *BBC*. 15 Dec. 2010. Web.
- ¹⁵ Dhawan, Himanshi. "India Leads Commonwealth Tally in Underweight Children." *The Times of India*. 14 Oct. 2010. Web.
- ¹⁶ *WHO Mortality Database*. World Health Organization. Web.
- ¹⁷ *Ibid*.
- ¹⁸ *Global Burden of Disease*. World Health Organization. 2008. Web.
- ¹⁹ *IDF Diabetes Atlas*. International Diabetes Federation. Web.
- ²⁰ Gale, Jason. "India's Diabetes Epidemic Cuts Down Millions Who Escape Poverty." *Bloomberg*. 7 Nov. 2010. Web.
- ²¹ "Budget 2012 India: Highlights of Pranab Mukherjee's speech." *Economic Times*. 16 Mar. 2012. Web.
- ²² India. Planning Commission. *Faster, Sustainable and More Inclusive Growth: An Approach to the Twelfth Five Year Plan (2012-2017)*. Oct. 2011. Web.
- ²³ Chanana, Dweep. "India as an Emerging Donor." *Economic and Political Weekly* 44.12 (2009). Web.
- ²⁴ Bijoy, C. J. "India: Transiting to a Global Donor." *Reality of Aid*. 2010. Web.
- ²⁵ *Ibid*.
- ²⁶ *Ibid*.
- ²⁷ Government of India official. Personal interview. Feb. 2012.
- ²⁸ *Ibid*.
- ²⁹ Mullen, Rani. Personal interview. Feb. 2012.
- ³⁰ Government of India official. Personal interview. Feb. 2012.
- ³¹ India. Ministry of External Affairs, Ministry of Finance. *Union Budget and Economic Survey 2011-2012*. Web.
- ³² *Ibid*.
- ³³ Agrawal, Subhash. "Emerging Donors in International Development Assistance: The India Case." *International Development Research Centre*. Dec. 2007. Web.
- ³⁴ Chanana, Dweep. "India as an Emerging Donor." *Economic and Political Weekly* 44.12 (2009). Web.
- ³⁵ Mullen, Rani. Personal interview. Feb. 2012.
- ³⁶ Baru, Sanjaya. Personal interview. Feb. 2012.
- ³⁷ "India announces \$5 bn credit line for Africa." *Indian Express*. 24 May 2011. Web.
- ³⁸ India. Ministry of External Affairs, Ministry of Finance. *Union Budget and Economic Survey 2011-2012*. Web.
- ³⁹ Agrawal, Subhash. "Emerging Donors in International Development Assistance: The India Case." *International Development Research Centre*. Dec. 2007. Web.
- ⁴⁰ *Ibid*.
- ⁴¹ Bijoy, C. J. "India: Transiting to a Global Donor." *Reality of Aid*. 2010. Web.
- ⁴² India. Ministry of External Affairs. *Outcome Budget 2011-2012*. Web.
- ⁴³ Government of India official. Personal interview. Feb. 2012.
- ⁴⁴ *Ibid*.
- ⁴⁵ "Budget 2012 India: Highlights of Pranab Mukherjee's speech." *Economic Times*. 16 Mar. 2012. Web.
- ⁴⁶ *Ibid*.
- ⁴⁷ *Ibid*.
- ⁴⁸ *Ibid*.
- ⁴⁹ India. Ministry of External Affairs. *Budget Outlay, 2008-2009, 2010-2011, 2011-2012*. Web.
- ⁵⁰ *Ibid*.
- ⁵¹ India. Ministry of External Affairs. *Budget Outlay, 2008-2009, 2010-2011, 2011-2012*. Web.
- ⁵² Government of India official. Personal interview. Feb. 2012.
- ⁵³ India. Ministry of External Affairs. *Budget Outlay, 2008-2009, 2010-2011, 2011-2012*. Web.
- ⁵⁴ *Ibid*.
- ⁵⁵ India. External Publicity Division. Ministry of External Affairs. *India and Afghanistan: A Development Partnership*. Web.
- ⁵⁶ Government of India official. Personal interview. Feb. 2012.
- ⁵⁷ *Global Polio Eradication Initiative*. 2010. Web.

- ⁵⁸ India. External Publicity Division, Ministry of External Affairs. *India and Afghanistan: A Development Partnership*. Web.
- ⁵⁹ Government of India official. Personal interview. Feb. 2012.
- ⁶⁰ "Sierra Leone link to India medics." *BBC*. 3 Nov. 2009. Web.
- ⁶¹ Malone, Berry. "Telemedicine links Africans to Indian expertise." *Reuters*. 3 Apr. 2008. Web.
- ⁶² Padma, TV and Ochieng Ogodo. "India to boost science collaboration with Africa." *Science and Development Network*. 9 Mar. 2012. Web.
- ⁶³ Patil, Shrimati Pratibha Devisingh. "Address by the Hon'ble President of India, Shrimati Pratibha Devisingh Patil, to Parliament." New Delhi, India. 4 Jun. 2009. Web.
- ⁶⁴ India. National Innovation Council. *India to launch \$1-bn innovation fund by June-July*. Jan. 2012. Web.
- ⁶⁵ "Brazil co to buy Lupin TB drug." *The Financial Express*. 6 Jan. 2011. Web.
- ⁶⁶ Waning, B, et al. "A lifeline to treatment: the role of Indian generic manufacturers in supplying antiretroviral medicines to developing countries." *Journal of the International AIDS Society* 13.35 (2010). Web.
- ⁶⁷ Chirac, Pierre. "Increasing the Access to Antiretroviral Drugs to Moderate the Impact of AIDS: an Exploration of Alternative Options." *AIDS, Public Policy and Child Well-Being*. UNICEF. 2007. Web.
- ⁶⁸ "AIDS, Drug Prices and Generic Drugs." *AVERT*. Web.
- ⁶⁹ Hamied, Yusuf. "An interview with Cipla's Yusuf Hamied – Indian Drug-Maker Leads the Charge for Low-Cost AIDS Drugs." *TREAT, amfAR*. Mar. 2003. Web.
- ⁷⁰ Bajaj, Vikas and Pollack, Andrew. "India Orders Bayer to License a Patented Drug." *The New York Times*. 12 Mar. 2012. Web.
- ⁷¹ Mathew, Joe. "Pharma FDI: Panel for urgent reversal." *Business Standard*. 23 Nov. 2011. Web.
- ⁷² Ojambo, Fred. "Cipla's Ugandan Unit to Invest \$50 Million in Tablet Expansion." *Bloomberg*. 26 Jan. 2012. Web.
- ⁷³ India. Press Information Bureau, Ministry of Earth Science. *India vaccine market reaches \$900 million*. Nov. 2011. Web.
- ⁷⁴ *Ibid.*
- ⁷⁵ "Quality of vaccines produced in India becoming a concern." *Press Trust of India*. 10 Feb. 2012. Web.
- ⁷⁶ Jadhav, Suresh. Personal interview. Feb. 2012.
- ⁷⁷ *Ibid.*
- ⁷⁸ *Ibid.*
- ⁷⁹ Chakma, Justin, et al. "Indian vaccine innovation: the case of Shantha Biotechnics." *Globalization and Health* 7.9 (2011). Web.
- ⁸⁰ "Dramatic fall in cases of meningitis A in three West African nations after new vaccine introduction." *Meningitis Vaccine Project*. 9 Jun. 2011. Web.
- ⁸¹ Inerfurth, Karl, and Persis Khambatta. "A U.S.-India Innovative Partnership." *U.S.-India Insight*. Center for Strategic and International Studies. Aug. 2011. Web.
- ⁸² "Innovation for a new world? Emerging markets, frugal innovation and changing R&D." *Swedish Agency For Growth Policy Analysis*. 2011. Web.
- ⁸³ "Case 19: Treating Cataracts in India." *Center for Global Development*. Web.
- ⁸⁴ "Lessons from a frugal innovator." *The Economist*. 16 Apr. 2009. Web.
- ⁸⁵ "Innovating Around India's Health Care Challenges." *India Knowledge @ Wharton*. University of Pennsylvania. 29 Jul. 2010. Web.
- ⁸⁶ India. Department of Biotechnology, Ministry of Science and Technology. *Annual Report (2009-2010)*. Web.
- ⁸⁷ *Ibid.*
- ⁸⁸ *Ibid.*
- ⁸⁹ India. Department of Biotechnology, Ministry of Science and Technology. *Small Business Innovation Research Initiative*. Web.
- ⁹⁰ India. Department of Biotechnology, Ministry of Science and Technology. *Annual Report (2009-2010)*. Web.
- ⁹¹ India. Department of Biotechnology, Ministry of Science and Technology. *Biotechnology Industry Partnership Program (BIPP)*. Web.
- ⁹² "Developing New Vaccines Against Rotavirus." *PATH*. Nov. 2008. Web.
- ⁹³ Koul, Rahul. "Mission: An indigenous rotavirus vaccine." *BioSpectrum*. 13 Feb. 2012. Web.

China

- ¹ *Open Data*. The World Bank. Web.
- ² "China." *The World Bank*. Web.
- ³ *Open Data*. The World Bank. Web.
- ⁴ "Modernisation in Sheep's Clothing." *The Economist*. 26 Aug. 2011. Web.
- ⁵ "China." *The World Bank*. Web.
- ⁶ "China." *U.S. Department of State*. 6 Sep. 2011. Web.
- ⁷ *Open Data*. The World Bank. Web.
- ⁸ "WTO: China Overtakes Germany as World's Largest Exporter." *People's Daily Online*. 30 Mar. 2010. Web.
- ⁹ Wang, Feng. "China's Population Destiny: The Looming Crisis." *Brookings-Tsinghua Center*. Sep. 2010. Web.
- ¹⁰ *Ibid.*
- ¹¹ "Chinese vice premier urges expanding domestic demand, keeping property curbs." *Xinhua*. 15 Dec. 2011. Web.
- ¹² Back, Aaron, and Esther Fung. "China to Increase Domestic Consumption to Aid Global Economy, Willing to Expand Europe Investment." *The Wall Street Journal*. 15 Sep. 2011. Web.

- ¹³ "China's massive stimulus creates side effects, economic development adjustments needed: economist." *Xinhua*. 2 Dec. 2011. Web.
- ¹⁴ Alderman, Liz, and David Barboza. "Europe Tries to Lure Chinese Cash to Back Rescue of Euro." *The New York Times*. 28 Oct. 2011. Web.
- ¹⁵ "Rising Power, Anxious State." *The Economist*. 23 Jun. 2011. Web.
- ¹⁶ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ¹⁷ "China's Developing-country Identity Remains Unchanged." *Xinhua*. 13 Aug. 2010. Web.
- ¹⁸ Chenxi, Wang, and Wei Jianhua. "China-Africa Friendship Enhanced by Diverse, Growing Cooperation." *Xinhua*. 29 Jan. 2012. Web.
- ¹⁹ Huang, Yanzhong. "The Sick Man of Asia." *Foreign Affairs*. Nov-Dec. 2011. Print.
- ²⁰ *Ibid.*
- ²¹ "2010: A global view of HIV infection." *UNAIDS*. 2010. Web.
- ²² Wu, Zunyou, et al. "Evolution of China's response to HIV/AIDS." *The Lancet* 369.9562 (2007): 679-690. Print.
- ²³ "HIV/AIDS Infections Soaring in China General Population: Experts." *Xinhua*. 30 Nov. 2011. Web.
- ²⁴ Yang, Gonghuan, et al. "Emergence of Chronic Non-communicable Diseases in China." *The Lancet* 372.9650 (2008): 1697-1705. Print.
- ²⁵ Huang, Yanzhong. "The Sick Man of Asia." *Foreign Affairs*. Nov-Dec. 2011. Print.
- ²⁶ "Towards a Tobacco-free China." *WHO Western Pacific Region*. World Health Organization. 7 Sep. 2011. Web.
- ²⁷ Huang, Yanzhong. "The Sick Man of Asia." *Foreign Affairs*. Nov-Dec. 2011. Print.
- ²⁸ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ²⁹ Chan, Lai-Ha, et al. "China's Engagement with Global Health Diplomacy: Was SARS a Watershed?" Ed. Kelley Lee. *PLoS* 7.4 (2010): E1000266. Web.
- ³⁰ Huang, Yanzhong. "The Sick Man of Asia." *Foreign Affairs*. Nov-Dec. 2011. Print.
- ³¹ China. Information Office of the State Council of the People's Republic of China. *China's Foreign Aid*. 2011. Web.
- ³² "Charity begins abroad." *The Economist*. 13 Aug. 2011. Web.
- ³³ China. Information Office of the State Council The People's Republic of China. *China's Foreign Aid*. 2011. Web.
- ³⁴ Huang, Yanzhong. "Domestic Factor's and China's Health Aid to Africa." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ³⁵ Chin, Gregory, and B. Michael Frolic. "Emerging Donors in International Development Assistance: The China Case." *International Development Research Centre*. Dec. 2007. Web.
- ³⁶ Huang, Yanzhong. "Domestic Factor's and China's Health Aid to Africa." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ³⁷ Huang, Yanzhong. "Domestic Factor's and China's Health Aid to Africa." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ³⁸ China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ³⁹ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁴⁰ Huang, Yanzhong. "Domestic Factor's and China's Health Aid to Africa." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁴¹ "Transparency could be the sticking point for China at Busan." *The Guardian*. 14 Nov. 2011. Web.
- ⁴² China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ⁴³ *Ibid.*
- ⁴⁴ Brautigam, Deborah. "Testimony on China's Growing Role in Africa before the United States Senate Committee on Foreign Relations Subcommittee on African Affairs." *United States Senate Committee on Foreign Affairs* 1 Nov. 2011. Web.
- ⁴⁵ "Understanding Chinese Foreign Aid: A Look at China's Development Assistance to Africa, Southeast Asia, and Latin America." *New York University Robert F. Wagner Graduate School of Public Service*. 28 Apr. 2008. Web.
- ⁴⁶ China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ⁴⁷ *Ibid.*
- ⁴⁸ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁴⁹ *Ibid.*
- ⁵⁰ *Ibid.*
- ⁵¹ "Decade-old China-Africa co-op forum yields rich results, has promising future." *Xinhua*. 18 Nov. 2010. Web.

- ⁵² Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁵³ Tarnoff, Curt, and Larry Nowels. "Foreign Aid: An Introductory Overview of U.S. Programs and Policy." *Congressional Research Service*. 15 Apr. 2004. Web.
- ⁵⁴ China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ⁵⁵ *Ibid.*
- ⁵⁶ *Ibid.*
- ⁵⁷ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ⁵⁸ China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ⁵⁹ Huang, Yanzhong. "Pursuing Health as Foreign Policy: The Chase of China." *Indiana Journal of Global Legal Studies* 17.1 (2010): 105-146. Print.
- ⁶⁰ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ⁶¹ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁶² *Ibid.*
- ⁶³ "About PPD." *Partners in Population and Development*. Web.
- ⁶⁴ "China Starts its First Foreign Aid Program in Population and Reproductive Health." *National Population and Family Commission of China*. 25 Oct. 2007. Web.
- ⁶⁵ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁶⁶ Huang, Yanzhong. "Pursuing Health as Foreign Policy: The Chase of China." *Indiana Journal of Global Legal Studies* 17.1 (2010): 105-146. Print.
- ⁶⁷ China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ⁶⁸ Huang, Yanzhong. "Pursuing Health as Foreign Policy: The Chase of China." *Indiana Journal of Global Legal Studies* 17.1 (2010): 105-146. Print.
- ⁶⁹ "Chinese doctors treat 260 mln patients by 2009 in foreign aid: white paper." *Xinhua*. 21 Apr. 2011. Web.
- ⁷⁰ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012.
- ⁷¹ *Ibid.*
- ⁷² Huang, Yanzhong. "Pursuing Health as Foreign Policy: The Chase of China." *Indiana Journal of Global Legal Studies* 17.1 (2010): 105-146.
- ⁷³ Liu, Peilong, et al. "China health aid to Africa." *Peking University Institute for Global Health*. 2011. Print.
- ⁷⁴ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012. Print.
- ⁷⁵ *Ibid.*
- ⁷⁶ China. Information Office of the State Council. *China's Foreign Aid*. 2011. Web.
- ⁷⁷ Brautigam, Deborah. "U.S. and Chinese Efforts in Africa in Global Health and Foreign Aid: Objectives, Impact, and Potential Conflicts of Interest." *China's Emerging Global Health and Foreign Aid Engagement in Africa*. Ed. Xiaoqing Lu Boynton. Center for Strategic and International Studies. 2012.
- ⁷⁸ "China." *Grant Portfolio*. The Global Fund to Fight AIDS, Tuberculosis and Malaria. Web.
- ⁷⁹ "Donor Governments." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 28 Feb. 2012. Web.
- ⁸⁰ LaFraniere, Sharon. "AIDS Funds Frozen for China in Grant Dispute." *The New York Times*. 20 May 2011. Web.
- ⁸¹ "HIV/AIDS: Global Fund cancels funding." *IRIN News*. 24 Nov. 2011. Web.
- ⁸² "UNAIDS applauds China's decision to fill its HIV resource gap." *UNAIDS*. 1 Dec. 2011. Web.
- ⁸³ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ⁸⁴ China Ministry of Health official. Personal interview. Feb. 2012.
- ⁸⁵ Brown, Hannah. "And the next Director-General of WHO is..." *The Lancet* 368.9549 (2006): 1757-1758. Web.
- ⁸⁶ "Dr Margaret Chan nominated for a second term to be WHO Director-General." *World Health Organization*. 18 Jan. 2012. Web.
- ⁸⁷ Huang, Yanzhong. "Pursuing Health as Foreign Policy: The Chase of China." *Indiana Journal of Global Legal Studies* 17.1 (2010): 105-146. Print.
- ⁸⁸ *Ibid.*
- ⁸⁹ "Drug-resistant tuberculosis now at record levels." *World Health Organization*. 18 Mar. 2010. Web.

- ⁹⁰ Wang, Longde, Jianjun Liu, and Daniel Chin. "Progress in tuberculosis control and the evolving public-health system in China." *The Lancet* 369.9562 (2007): 691-696. Print.
- ⁹¹ "Meeting Report: A Ministerial Meeting of High M/ZDR-TB Burden Countries." *World Health Organization*. 2009. Web.
- ⁹² Stone, Richard. "China Bets Big on Small Grants, Large Facilities." *Science* 331 (2011): 1251. Web.
- ⁹³ Kaufman, Joan. "IAVI Internal Strategy Paper (unpublished)." *IAVI*. 2009. Print.
- ⁹⁴ Topal, Claire, and Karuna Luthra. "A Pivotal Moment for China & Vaccine Manufacturing: An Interview with Jiankang (Jack) Zhang." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ⁹⁵ Bill & Melinda Gates Foundation Program Officer. Personal interview. Feb. 2012.
- ⁹⁶ Topal, Claire, and Karuna Luthra. "A Pivotal Moment for China & Vaccine Manufacturing: An Interview with Jiankang (Jack) Zhang." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ⁹⁷ Kaufman, Joan. "IAVI Internal Strategy Paper (unpublished)." *IAVI*. 2009. Print.
- ⁹⁸ Kaufman, Joan. "IAVI Internal Strategy Paper (unpublished)." *IAVI*. 2009. Print.
- ⁹⁹ Stone, Richard. "China Bets Big on Small Grants, Large Facilities." *Science* 331 (2011): 1251. Web.
- ¹⁰⁰ Li, Liu. "Research Priorities and Priority-setting in China." *Vinnova*. Nov. 2009. Web.
- ¹⁰¹ *Ibid.*
- ¹⁰² Bumpas, Janet and Ekkehard Betsch. "Exploratory Study on Active Pharmaceutical Ingredient Manufacturing for Essential Medicines." *The World Bank*. Sep. 2009. Web.
- ¹⁰³ *Ibid.*
- ¹⁰⁴ *Ibid.*
- ¹⁰⁵ "Preparing for the Global Market: China's Expanding Role as a Vaccine Manufacturer." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ¹⁰⁶ Bill & Melinda Gates Foundation Program Officer. Personal interview. Feb. 2012.
- ¹⁰⁷ "Preparing for the Global Market: China's Expanding Role as a Vaccine Manufacturer." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ¹⁰⁸ Topal, Claire and Karuna Luthra. "A Pivotal Moment for China & Vaccine Manufacturing: An Interview with Jiankang (Jack) Zhang." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ¹⁰⁹ *Ibid.*
- ¹¹⁰ Cyranoski, David. "China rushes through major funding system." *Nature* 455.142 (2008). Web.
- ¹¹¹ Kaufman, Joan. "IAVI Internal Strategy Paper (unpublished)." *IAVI*. 2009. Print.
- ¹¹² McGregor, James. "China's Drive for Indigenous Innovation: A Web of Industrial Policies." *Global Intellectual Property Center, U.S. Chamber of Commerce and APCO Worldwide*. 2010. Web.
- ¹¹³ *Ibid.*
- ¹¹⁴ Hendriks, J., Yan Ling, and Bing Zeng. "China's emerging vaccine industry." *Human Vaccines* 6.7 (2010): 602-607. Web.
- ¹¹⁵ "Preparing for the Global Market: China's Expanding Role as a Vaccine Manufacturer." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ¹¹⁶ Wong, Gillian. "China prepares for big entry into vaccine market." *The Associated Press*. 29 Nov. 2011.
- ¹¹⁷ *Ibid.*
- ¹¹⁸ "Preparing for the Global Market: China's Expanding Role as a Vaccine Manufacturer." *The National Bureau of Asian Research*. 25 May 2011. Web.
- ¹¹⁹ *Ibid.*
- ¹²⁰ *Ibid.*
- ¹²¹ "Chinese vaccines struggling to go global." *Xinhua*. 29 Feb. 2012. Web.
- ¹²² "Historic protection for Asia's children." *Japanese Encephalitis Project*. PATH. Dec. 2009. Web.
- ¹²³ *Ibid.*
- ¹²⁴ *Ibid.*
- ¹²⁵ "On the fast track to control: Recognition of Japanese encephalitis leads to action." *Japanese Encephalitis Project*. PATH. Web.
- ¹²⁶ "Aeras and CNBG Sign Agreement on Tuberculosis Vaccine R&D." *PR Newswire*. 1 Jan. 2012. Web.
- ¹²⁷ "New vaccine partnership in China." *PATH*. 9 Jul. 2007. Web.
- ¹²⁸ China. Information Office of the State Council. *Family Planning in China*. 1995. Web.
- ¹²⁹ "Expanding Contraceptive Choice: Five Promising Innovations." *Population Reference Bureau*. Jun. 2009. Web.
- ¹³⁰ Yun, Hu. "China's Practice in Commodity Security for National Family Planning Program." *China Training Center of Reproductive Health and Family Care*. 10 Dec. 2010. Web.
- ¹³¹ "Sino-Implant (III) Project Fact Sheet." *FHI 360*. Feb. 2012. Web.
- ¹³² "Sino-Implant (III) – A Dramatically Less-Expensive Implant Option." *USAID*. Jun. 2009. Web.
- ¹³³ "Sino-Implant (II)." *FHI 360*. Oct. 2008. Web.
- ¹³⁴ "Sino-Implant (III) Project Fact Sheet." *FHI 360*. Feb. 2012. Web.
- ¹³⁵ Steiner, Markus. Personal interview. Feb. 2012.
- ¹³⁶ "Female Condom: A Powerful Tool for Protection." *UNFPA and PATH*. 2006. Web.

South Africa

- ¹ "Jobless Growth." *The Economist*. 3 Jun. 2010. Web.
- ² *Open Data*. The World Bank. Web.
- ³ *Ibid*.
- ⁴ "China Becomes South Africa's Biggest Export Destination: Ambassador." *Xinhua*. 21 Aug. 2011. Web.
- ⁵ "Sub-Saharan African GDP Growth Forecasts." *The Economist*. 22 Oct. 2011. Print.
- ⁶ "Quarterly Labour Force Survey: Quarter 3 [July to September], 2011." *Statistics South Africa*. 1 Nov. 2011. Web.
- ⁷ "2011 World Population Data Sheet." *Population Reference Bureau*. 2011. Web.
- ⁸ "South Africa." *OECD*. Web.
- ⁹ "South Africa." *African Economic Outlook*. 2011. Web.
- ¹⁰ Alves, Ana C. "South Africa-China Relations: Getting Beyond the Cross-roads?" *Sunday Independent*. 29 Aug. 2010. Web.
- ¹¹ South Africa. *Building a Better World: The Diplomacy of Ubuntu*. 13 May 2011. Web.
- ¹² "Disease and injury country estimates." *World Health Organization*. 2008. Web.
- ¹³ "South Africa - Tuberculosis Profile." *World Health Organization*. 2010. Web.
- ¹⁴ "HIV and AIDS in South Africa." *HIV & AIDS Around the World*. AVERT. Web.
- ¹⁵ "Country of South Africa: Country Progress Report on the Declaration of Commitment on HIV/AIDS." *UNAIDS*. 31 Mar. 2010. Web.
- ¹⁶ Government of South Africa official. Personal interview. Feb. 2012.
- ¹⁷ *World Databank*. The World Bank. Web.
- ¹⁸ "South Africa unveils universal health scheme." *BBC*. 12 Aug. 2011. Web.
- ¹⁹ Grimm, Sven. "South Africa as a Development Partner in Africa: Policy Brief Number 11." *European Development Cooperation to 2020*. Mar. 2011. Print.
- ²⁰ Braude, Wolfe, et al. "Emerging Donors in International Development Assistance: The South Africa Case." *International Development Research Centre*. Jan. 2008. Web.
- ²¹ "South Africa." *Global Humanitarian Assistance*. Web.
- ²² Chidauhe, Moreblessings, Pearl Thandrayan, and Elizabeth Sidiropoulos. "South-South Cooperation or Southern Hegemony? The Role of South Africa as a 'superpower' and donor in Africa." *Reality of Aid Africa Project*. Web.
- ²³ "Briefing by Department of International Relations & Co-operation on legislation for establishment of SADPA." *Parliamentary Monitoring Group*. 2 Aug. 2011. Web.
- ²⁴ South Africa. Department of International Relations and Cooperation. *Report on the African Renaissance and International Cooperation fund 2009/10*. Web.
- ²⁵ Walz, Julie, and Ramachandran, Vijaya. "Brave New World: A Literature Review of Emerging Donors and the Changing Nature of Foreign Assistance." *Center for Global Development*. 2011. Web.
- ²⁶ Kragelund, Peter. "The Potential Role of Non-Traditional Donors' Aid in Africa: Issue Paper 11." *International Centre for Trade and Sustainable Development*. Feb. 2010. Web.
- ²⁷ South Africa. Department of International Relations and Cooperation. *Report on the African Renaissance and International Cooperation Fund 2009/10*. Web.
- ²⁸ Tapula, Tobelo, et al. "South Africa's development partnership agency: A burden or blessing?" *The South African Institute of International Affairs*. 21 Oct. 2011. Web.
- ²⁹ "Briefing by Department of International Relations & Co-operation on legislation for establishment of SADPA." *Parliamentary Monitoring Group*. 2 Aug. 2011. Web.
- ³⁰ Bliss, Katherine, et al. "Key Players in Global Health: How Brazil, Russia, India, China and South Africa Are Influencing the Game." *CSIS Global Health Policy Center*. Nov. 2010. Print.
- ³¹ Government of South Africa official. Personal interview. Feb. 2012.
- ³² Government of South Africa official. Personal interview. Jan. 2012.
- ³³ South Africa. National Department of Health. *National Department of Health, Annual Report, 2009/2010*. Web.
- ³⁴ Okole, Blessed. Personal interview. Jan. 2012.
- ³⁵ *Ibid*.
- ³⁶ "About the Treatment Action Campaign." *Treatment Action Campaign*. Web.
- ³⁷ South Africa. Department of Science and Technology. *National Survey of Research & Experimental Development 2008/09*. Oct. 2010. Web.
- ³⁸ Al-Bader, Sara, et al. "Small but tenacious: South Africa's health biotech sector." *Nature Biotechnology* 27 (2009): 427 – 445. Print.
- ³⁹ *South African AIDS Vaccine Initiative*. Web.
- ⁴⁰ Creamer, Terence. "SA sets up agency to bridge gap between research and commercialization." *Engineering News*. 29 Oct. 2010. Web.
- ⁴¹ "Anti-HIV gel leadership team acknowledged for outstanding achievement in world health." *EurekaAlert*. 20 Jun. 2011. Web.
- ⁴² Auvert, Bertrand, et al. "Randomized, Controlled Intervention Trial of Male Circumcision for Reduction of HIV Infection Risk: The ANRS 1265 Trial." *PLoS* 2.11 (2005). Web.
- ⁴³ Al-Bader, Sara, et al. "Small but tenacious: South Africa's health biotech sector." *Nature Biotechnology* 27 (2009): 427–445. Print.
- ⁴⁴ "Aspen Generics." *Aspen Holdings*. Web.
- ⁴⁵ "GSK buys into Aspen Pharmacare." *SouthAfrica.info*. 13 May 2009. Web.

Beyond BRICS

- ¹ "Arab Development Assistance: Four Decades of Cooperation." *The World Bank*. Jun. 2010. Web.
- ² *Ibid.*
- ³ *Ibid.*
- ⁴ "DAC1 Official and Private Flows." *OECD*. Web.
- ⁵ *Ibid.*
- ⁶ "Saudi Arabia Donates US\$25,000,000 to the Global Fund." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 24 Jan. 2012. Web.
- ⁷ "Kuwait donates USD 500,000 to Global Fund to Fight AIDS, Tuberculosis, Malaria." *Kuwait News Agency*. 21 Nov. 2012. Web.
- ⁸ "Contributions." *Global Polio Eradication Initiative*. Web.
- ⁹ "Saudi Arabia Gives \$30 Million toward Polio Eradication Efforts." *United Nations Foundation*. 28 Sep. 2011. Web.
- ¹⁰ Tinder, Paul. "UAE Donates \$50 Million to Fight Polio." *Vaccine News Daily*. 20 May 2011. Web.
- ¹¹ "His Highness Sheikh Mohamed bin Zayed Al Nahyan." *GAVI Alliance*. Web.
- ¹² "Carter Center Welcomes Gates Foundation, UAE, CIFF Funding to Achieve Guinea Worm Eradication." *Carter Center*. 30 Jan. 2012. Web.
- ¹³ "Arab Development Assistance: Four Decades of Cooperation." *The World Bank*. Jun. 2010. Web.
- ¹⁴ "Mission." *Qatar Foundation*. Web.
- ¹⁵ "Annual Report 2009-10." *Qatar Foundation*. Web.
- ¹⁶ "Qatar Development Fund Meets." *Qatar News Agency*. 19 May 2011. Web.
- ¹⁷ Agonia, Ailyn. "Qatar to Launch Global Alliance on Food Security." *Qatar Tribune*. 12 Dec. 2011. Web.
- ¹⁸ Ghumann, Mushtaq. "Joint Exploration of Hydropower: Pakistan, Qatar May Sign Two MOUs." *Business Recorder*. 4 Feb. 2012. Web.
- ¹⁹ "World Economic Outlook Database." *International Monetary Fund*. Sep. 2011. Web.
- ²⁰ "Business: Turkey's 2010 GDP Growth Is Highest in Europe." *SE Times*. 4 Jan. 2011. Web.
- ²¹ Moussaoui, Rana. "Moderate Arab Spring Islamists look to 'Turkish model' for new democracies." *Agence France Presse*. 2 Dec. 2011. Web.
- ²² Kulaklikaya, Musa and Rahman Nurden. "Turkey as a New Player in Development Cooperation." *Insight Turkey* 12.4 (2010): 131-145. Web.
- ²³ Walz, Julie, and Vijaya Ramachandran. "Brave New World: A Literature Review of Emerging Donors and the Changing Nature of Foreign Assistance." *Center for Global Development*. 2011. Web.
- ²⁴ "DAC1 Official and Private Flows." *OECD*. Web.
- ²⁵ "Turkey Key Development Indicators." *AidFlows*. The World Bank. Web.
- ²⁶ "DAC1 Official and Private Flows." *OECD*. Web.
- ²⁷ "Contributions." *Global Polio Eradication Initiative*. Web.
- ²⁸ Ökem, Z. Güldem. "Innovation in the health sector in Turkey." *Turkish Industry and Business Association and Centre for European Policy Studies*. Feb. 2011. Web.
- ²⁹ Campbell, David, and Mandy Chui. "Pharmerging Shake-Up: New Imperatives in a Re-Defined World." *IMS Health*. 2010. Web.
- ³⁰ "Population (in Thousands) Total." *United Nations*. Web.
- ³¹ Walz, Julie and Vijaya Ramachandran. "Brave New World: A Literature Review of Emerging Donors and the Changing Nature of Foreign Assistance." *Center for Global Development*. 2011. Web.
- ³² Fidler, David P. "Assessing the Foreign Policy and Global Health Initiative: the Meaning of the Oslo Process." *Chatham House*. Jun. 2011. Web.
- ³³ "WHO Prequalified Vaccines." *World Health Organization*. 22 Jun. 2011. Web.
- ³⁴ "Looking for a Shot in the Arm." *Bio Farma*. Web.
- ³⁵ "Indonesia expecting to produce bird flu vaccine next year." *Jakarta Globe*. 26 Jan. 2012. Web.
- ³⁶ "Debt2Health." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. Web.
- ³⁷ "Start of Debt2Health in Indonesia." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 1 Jun. 2008. Web.
- ³⁸ "Third Debt2Health Agreement Signed Between Australia, Indonesia and the Global Fund Over AUS\$ 75 Million to Increase Tuberculosis Services in Indonesia." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 15 Jul. 2010. Web.
- ³⁹ "Donor Governments Statistics." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 15 Apr. 2011. Web.
- ⁴⁰ "Global Fund Eligibility List for 2012 Funding Channels." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 13 Jan. 2012. Web.
- ⁴¹ "Indonesia." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 23 Feb. 2012. Web.
- ⁴² "World Economic Outlook Database." *International Monetary Fund*. Sep. 2011. Web.
- ⁴³ Lätt, Jeanne. "Mexico as an 'Emerging Donor.'" *European Development Cooperation to 2020*. Mar. 2011. Web.
- ⁴⁴ Mexico. Economic Relations and International Cooperation Unit. Secretaría de Relaciones Exteriores. *Information System of Mexico's International Cooperation for Development*. Web.
- ⁴⁵ Mexico. Embassy of Mexico in Canada. Secretaría de Relaciones Exteriores. *Landmark in Mexican Foreign Policy, Creation of The Mexican Agency for International Cooperation for Development (AMEXCID)*. 27 Sep. 2011. Web.
- ⁴⁶ "The G20 development working group to meet in Mexico City." *G20*. 30 Jan. 2012. Web.
- ⁴⁷ "2010 Annual Report." *Carlos Slim Health Institute*. 2011. Web.

- ⁴⁸ *Ibid.*
- ⁴⁹ "Bill & Melinda Gates Foundation, Carlos Slim Health Institute, Spain, and the IDB Collaborate to Improve Health of the Poor in Mesoamerica". *Inter-American Development Bank*. 14 Jun. 2010. Web.
- ⁵⁰ "Birmex." *Developing Countries Vaccine Manufacturers Network*. Web.
- ⁵¹ *Ibid.*
- ⁵² "Investigación y Desarrollo." *Birmex*. 12 Nov. 2010. Web.
- ⁵³ "World Economic Outlook Database." *International Monetary Fund*. Sep. 2011. Web.
- ⁵⁴ "S. Korea becomes first former aid recipient to join OECD Development Assistance Committee." *The Hankyoreh*. 26 Nov. 2009. Web.
- ⁵⁵ "DAC1 Official and Private Flows." *OECD*. Web.
- ⁵⁶ "Republic of Korea Key Development Indicators." *AidFlows*. The World Bank. Web.
- ⁵⁷ Choo, Kyu-Ho. "Britain's Generosity in Aid Provision." *Embassy of the Republic of Korea in the United Kingdom of Great Britain and Northern Ireland*. 29 Feb. 2012. Web.
- ⁵⁸ "4th High Level Forum on Aid Effectiveness." *Aid Effectiveness*. Asia-Pacific Aid Effectiveness Portal. Web.
- ⁵⁹ "DAC1 Official and Private Flows." *OECD*. Web.
- ⁶⁰ "Donor Governments Statistics." *The Global Fund to Fight AIDS, Tuberculosis and Malaria*. 15 Apr. 2011. Web.
- ⁶¹ "Republic of Korea." *GAVI Alliance*. Web.
- ⁶² Grahl, Arnold R. "Ban Ki-moon receives polio champion award." *Rotary International*. 21 Jun. 2009. Web.
- ⁶³ "2010 Annual Report." *International Vaccine Institute*. 2010. Web.
- ⁶⁵ *Ibid.*
- ⁶⁶ *Ibid.*
- ⁶⁷ "WHO facilitates new polio vaccine technology transfer." *Global Polio Eradication Initiative*. 12 Jan. 2012. Web.

For inquiries please contact:
info@ghsinitiatives.org



GHSi
ghsinitiatives.org