

Health infrastructure determinants of World Bank foreign aid:
Empirical evidence from sub-Saharan Africa, 1991-2001

Joshua Matthew Harris¹

30 April 2002

For consideration for honors in International Political Economy

¹ This paper was submitted as senior thesis in IPEC-401 Senior Seminar at the Georgetown University School of Foreign Service, Washington, DC, 20057. I wish to thank Dr. Anders Olofsgard, Dr. George Shambaugh, Elizabeth Hanley, Christopher Griffin, Kathryn Magee, and the participants of the 2002 Carroll Round Conference for their constructive comments on the preparation of this paper.

Abstract

A recent surge of criticism of the allocation and effectiveness of World Bank development assistance programs has threatened to precipitate a major reworking of multilateral foreign aid policy. Though recent research has shown that aggregate aid flows respond primarily to measures of openness and stability, health-specific International Development Agency loans overwhelmingly favor recipient countries in sub-Saharan Africa with strong pre-existing health infrastructure, lower income, and previous World Bank commitment in the country. This paper considers the motives underlying the allocation of IDA health development assistance in 47 sub-Saharan African countries from 1991-2001. The sensitivity analysis section of this paper concludes that this model specification is robust to the addition of controls for size of the recipient country and partially robust to an expanded dataset of recipient countries outside of sub-Saharan Africa. Based on empirical findings that the considered aid disbursements respond robustly to non-political factors, the World Bank chooses to allocate health aid both where it is needed and where it can be used more effectively for public health development – a necessary intermediary step of the World Bank’s larger mission of poverty alleviation. If through investment in countries where health aid can be used most effectively the World Bank is able to show that health infrastructure investment improves poverty levels, multilateral donors can expropriate ineffectual aid to health projects in developing countries that currently exhibit sub-standard levels of health infrastructure development.

Table of Contents

I.	Introduction	2
II.	Background	3
	A. Literature Review	3
	B. Health development assistance in context	5
III.	Health infrastructure as a causal link to poverty alleviation	8
IV.	Building a health-response aid allocation model	12
V.	Case selection and data availability	15
	A. Country selection	15
	B. Variable definition	16
VI.	Regressions and results	23
VII.	Sensitivity analysis	27
VIII.	Policy implications for future World Bank foreign aid	30
IX.	Conclusion	32
X.	Appendix A: Charts and Tables	34
XI.	Appendix B: Bibliography	41

I. Introduction

The World Bank is in crisis. Freed from the Cold War political constraints of donors after 1991, the World Bank offered a unique outlet for the developing economies of sub-Saharan Africa to receive financial development assistance absent the political and geo-strategic motives that drove bilateral aid flows. After ten years of aggressive foreign assistance disbursements to the continent, critics of the Bank's development assistance programs have sharply attacked the misallocation and ineffectiveness of multilateral foreign aid programs in Africa with potentially profound implications for the future direction and even existence of World Bank foreign aid policy.²

This paper considers the motivations of the International Development Agency – the concessional loan window of the World Bank -- in allocating development assistance resources to health infrastructure programs in sub-Saharan Africa from 1991-2001. Empirical evidence suggests that controlling for general policy goals common to all multilateral development assistance – promoting international integration and regional stability – health program funding still responds to positive health infrastructure development within the recipient country, greater need as measured by lower per capita income, and previous commitment on the part of the World Bank to fund health programs in the recipient country. Development literature often considers the allocation of foreign aid isolated from the causal connection between financial transfers and amelioration in social welfare. The positive response of World Bank aid monies to health infrastructure improvement suggests that the World Bank views the development of health infrastructure as a necessary precursor to its primary objective of poverty alleviation.

² For a summary of recent criticism of World Bank development policy, see Beattie, Alan. "The World Bank – feeling the pressure." *Financial Times*. 28 November 2001 and Einhorn, Jessica. "The World Bank's Mission Creep." *Foreign Affairs*. September/October 2001.

Furthermore, the positive connection between multilateral health aid and health performance and commitment might partially rebuke recent criticism of the World Bank's failure to cure poverty within sub-Saharan Africa; though health infrastructure buildup has yet to result in measurable improvements in poverty levels, research into the motives underlying health assistance allocation suggests that the World Bank allocates health aid based both on potential effectiveness and need. If one accepts the argument that health infrastructure development must predate appreciable changes in poverty levels, the World Bank's commitment to fund health infrastructure development suggests the Bank has not ignored its mission to end poverty. Rather, it suggests that critics of the World Bank's performance have not specifically considered the allocation motives driving health-related development assistance to sub-Saharan Africa.

II. Background

Literature Review

William Easterly's recent evaluations of the efficacy of World Bank development assistance programs in sub-Saharan Africa exemplify a decade of criticism.³ Easterly's research fails to find a significant empirical correlation between the quantity of multilateral aid flows to Africa and improvements in individual welfare as measured by the per capita level of income. By disproving a short-term statistical link between aid and income improvement, Easterly calls into question both the appropriateness of the allocation of World Bank resources among recipient developing countries and also the efficiency of the aid programs undertaken with IDA funding.

³ Easterly, William. *The Elusive Quest for Growth*. Cambridge, MA: MIT Press, 2001.

The World Bank does not mince its words concerning its teleological objective: “Our dream is a world free of poverty.”⁴ If World Bank development assistance truly aims at poverty alleviation, evaluating the allocation and effectiveness of that assistance reduces to a debate over the appropriate indicator of poverty – per capita income, income by quintile, infant mortality, life expectancy, et al. Studies by Boone (1994) and Boone (1996) have failed to establish a strong connection between World Bank development assistance and any such poverty indicator, suggesting that the motivations behind the allocation of World Bank resources to African countries consider more than simply the level and distribution of income within that country.⁵

Alesina and Dollar (2000) explain bilateral flows of development assistance in terms of political and geo-strategic motivations within the donor countries rather than the economic or political climate within the recipient country.⁶ Specifically, Alesina and Dollar conclude that colonial history and political alliances (measured in terms of voting patterns within the United Nations) are major determinants of foreign aid flows from Development Assistance Committee (DAC) countries. Nevertheless, they find considerable discord between individual bilateral donors, suggesting that the motivations for aid giving vary with the political ambitions of the donor.

Burnside and Dollar (1997) introduce motives driven by the reasonable expectation of successful of any foreign aid project – openness, political stability, political freedom within the recipient country, and previous institutional commitment within the country. Clearly the World Bank seeks to engage aid recipients in the

⁴ World Bank website. Available online: <http://www.worldbank.org>.

⁵ Boone, P. *Politics and Effectiveness of Foreign Aid*. NBER Working Paper No. w5308. February 1996.

⁶ Alesina, Alberto and David Dollar. *Who Gives Foreign Aid to Whom and Why?* Journal of Economic Growth, 5: 33-63. March 2000.

international trading system and to promote regional stability through its financial transfers. In addition to furthering these objectives common to all multilateral aid disbursements, the World Bank could reasonably expect aid projects to be more effective in countries that display greater openness and stability.⁷

Health development assistance in context

I seek to extrapolate the presumed effectiveness and need motives for development assistance contained in the literature to the case of IDA health development assistance to sub-Saharan Africa during the 1990s. The World Bank on its own has neither colonial history nor geo-strategic ambition apart from that of its donor countries. Absent the political motives driving bilateral aid donors during and even after the Cold War, the World Bank claims to have undertaken development assistance programs aimed exclusively at poverty alleviation. Criticism of the World Bank's aid effectiveness in Africa has suggested that the World Bank has not allocated financial resources consistent with available poverty indicators but rather with the political motives of key World Bank donors.⁸

I hypothesize that the World Bank has allocated health project assistance consistent both with need in the recipient country and the reasonable expectation that the aid project will be successful. Rather than consider the responsiveness of aggregate multilateral aid flows based on macroeconomic performance or overall poverty within a particular recipient country, I consider International Development Agency projects

⁷ Burnside, C. and D. Dollar. *Aid, Policies, and Growth*. The World Bank, Policy Research Dept. Working Paper No. 1777. June 1997.

⁸ See Lancaster, Carol. *Aid to Africa: so much to do, so little done*. Chicago: University of Chicago Press, 1999. pp. 74-82.

specifically aimed at the development of health infrastructure in order to disaggregate the allocation process into a specific sector. Foreign aid literature has already addressed the allocation issue in aggregate; by considering only the allocation motives in the health sector, I can more directly control for factors likely to influence the specific success of health projects such as pre-existing health infrastructure development. Furthermore, recent internal assessments of aid projects have frequently referred to investment in health programs as a necessary though insufficient precondition for aggregate improvement in per capita income within the recipient country; therefore, considering the allocation motives of health aid in isolation allows me to consider in detail one potential causal channel between financial disbursement and income improvement.

Of the 1029 development assistance projects funded by the World Bank in sub-Saharan Africa (through either the International Bank for Reconstruction and Development or the International Development Agency) since 1991, only 71 have specifically been classified as “Health, Nutrition, and Population” programs.⁹ Empirical evidence suggests that these development assistance programs specifically aimed at health infrastructure development favor countries with stronger public health systems; that is, the World Bank allocates health project aid consistent with the reasonable expectation of a higher degree of pre-existing health development will allow for more effective use of additional health aid. As specific indicators of existing health infrastructure within the recipient country, I consider infant mortality rates, life expectancy, the presence of foreign health-related NGOs, the quantity of health personnel available for work, and indicators of the effectiveness of the government in disbursing money to specific projects. Controlling for indicators of trade, openness, demographic

⁹ World Bank, Available online: <http://www4.worldbank.org/sprojects>.

stability and population effects, my analysis also suggests that in addition to responding robustly to the initial level of health development within the recipient country, the IDA allocates relatively more aid to countries with marginally lower per capita income levels and those countries with a previous IDA commitment to health development.

While the critics have failed to find evidence of a commitment to poverty reduction in the allocation decisions of aggregate World Bank aid flows, I can partially explain IDA health project allocation in terms of pre-existing health infrastructure, income, and previous World Bank commitment. Controlling for overall motives common to all World Bank development assistance programs and likely to influence the effectiveness of any aid project – engagement in the international trading community and regional stability – if health development assistance programs target countries with stronger public health systems and greater financial need, the World Bank would seem to rebuff criticism that it disburses resources irrespective of need and irrespective of a reasonable expectation of effectiveness. Furthermore, the decisions to allocate health aid where it can be used most effectively raise the possibility that the World Bank is attempting to evaluate health infrastructure as a causal link between multilateral foreign aid and poverty alleviation.¹⁰

The correlation between IDA aid flows and indicators of health care performance – infant mortality rates, life expectancy rates, the number of doctors and nurses operating within the country – indicate that the World Bank allocates resources to health programs to countries that have already shown a commitment to health development. Furthermore, the number of foreign health workers operating within the recipient country positively

¹⁰ For more information on the interplay of projected effectiveness and absolute need of multilateral aid allocation, see Collier, P. and D. Dollar. *Aid Allocation and Poverty Reduction*. Policy Research Working Paper 2041. World Bank. 1999.

correlates with aid flows, though this may suggest that both the World Bank and health NGOs are driven by the same altruistic or humanitarian motives in choosing which countries require their assistance.

That an improvement in the infant mortality rate within an aid receiving country translates into higher health-related development assistance raises a common causality objection. A positive correlation between aid and health infrastructure development suggests either that World Bank aid programs lead to the improvement in the health situation on the ground or that the World Bank rewards countries that have already shown positive performance in this policy area when allocating development assistance funding. My research focuses on the allocation question rather than the involved and much-discussed debate over the effectiveness of different types of multilateral and bilateral foreign assistance programs. A positive correlation between aid disbursement and proxies for health development suggests either that the World Bank allocates aid where it can be used most effectively or that World Bank aid translates into improved health infrastructure.

III. Health infrastructure as causal link to poverty alleviation

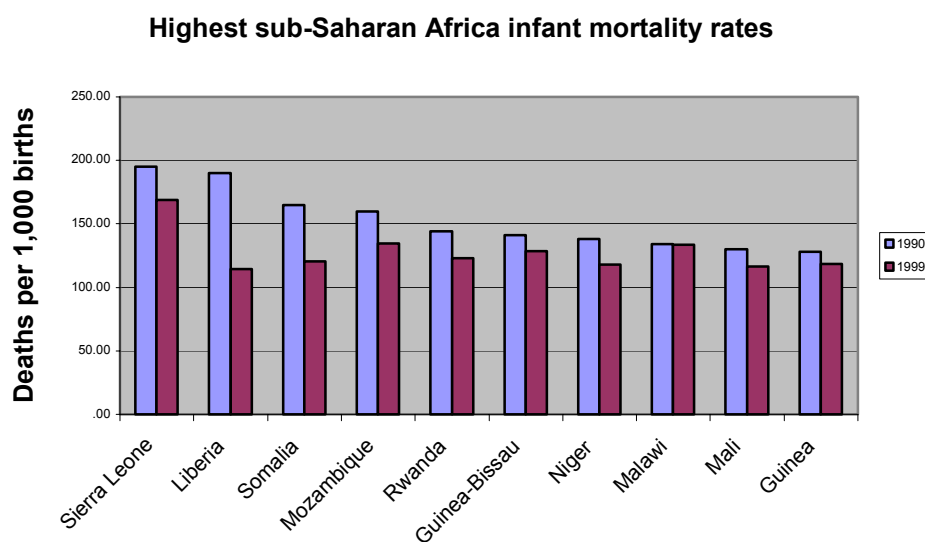
Internal World Bank literature has consistently asserted that positive health infrastructure development and nutrition programs serve as necessary prerequisites to the broader goal of poverty elimination and overall economic development.¹¹ Despite recent improvements in public health services available to citizens of sub-Saharan Africa, the region lacks considerably behind post-industrialized countries in term of infant and child mortality, disease prevention, and disease treatment and diagnosis. The vast majority of

¹¹ International Development Agency. Available online: <http://www.worldbank.org/ida>.

diseases rampant through the region are communicable through everyday contact, necessarily intermingling passage of disease and even the most basic of economic interaction.

Development literature has come to accept health infrastructure indicators as proxy measures of poverty levels given complications in data acquisition in Africa. Burnside and Dollar (1998) propose infant mortality as a measure of income misdistribution, arguing that increases in deaths by children under one year old reflects the economic empowerment of low-income families to seek appropriate medical treatment.¹² While the average infant mortality rate in the developed world rests around six per one thousand births, empirical data from sub-Saharan Africa reflects the developing world average infant mortality rate of approximately two hundred per thousand births.

Chart A. Selected infant mortality rates.



¹² Burnside, C. and D. Dollar. *Aid, the Incentive Regime, and Poverty Reduction*. The World Bank, Policy Research Dept. Working Paper No. 1937. June 1998.

Despite tremendously high levels of infant mortality at the beginning of the 1990s, the dynamic trends across the continent are striking. Of 47 countries considered in this research, 36 have shown a statistical improvement throughout the 1990s. The best performers have been Niger, the Gambia, Rwanda, Mozambique, Sierra Leone, and Somalia with decreases in the incidence of infant mortality by greater than 20 infants per thousand births; moreover, Liberia has shown the most dramatic appreciation, with a decrease in infant mortality by nearly 40% over the past decade. Nevertheless, Liberia has received no specific health-related aid funding from the World Bank over the period considered owing to domestic civil war and instability likely to undermine the effectiveness of health aid in the country.¹³

Not surprisingly, infant mortality rates display a strong negative correlation with per capita income. The initial rate of infant mortality in 1990 exhibits a correlation coefficient of $r = -0.594$ with average per capita income by country over the 1990s, implying that both per capita income – a standard measure of poverty and income maldistribution – and this important health indicator display a strong negative relationship. The interpretation of this result proves more problematic; that is, an improvement in individual income is associated with a strong decrease in infant mortality rates while increases in infant mortality cases are associated with depressions of average income.

Though a statistical link between availability of public health resources and poverty reduction has been routinely affirmed in the development literature, the direction of causality between poor health infrastructure and poverty is strongly debated. Pursuant with its mission to “provide for a healthier population,” the International Development

¹³ World Bank, African Development Indicators Database 2001.

Agency maintains both that “poor people are less healthy and more exposed to the risks of ill health and people can become poorer as a result of bad health or a health crisis within the household.”¹⁴ On the one hand, improved per capita income allows lower income families to immunize children in rural environments; according to recent health studies, approximately two million children die annually from diseases preventable with appropriate vaccination. Malnutrition and communicable diseases strongly influence child mortality data (defined as incidence of death by persons under five years old). That higher income leads to increased instances of immunization lends credence to the notion that improved income might serve as both a cause and effect of increased public health development.

In order to evaluate the hypothesis that the International Development Agency effectively and appropriately responds to health needs as a step on the way to poverty alleviation, one must first establish the reverse causal link: that improved health infrastructure and public health performance leads to decreased levels of poverty. Under the assumption that depressed incidence of communicable diseases frees and enables a country’s workforce to participate in productive economic activity, the World Bank has targeted health programs in three general directions: systems development, disease-specific prevention and control, and limitation of non-communicable diseases.¹⁵ In terms of health systems development, the World Bank allocates aid to further universal access to health facilities and care personnel, increase education about health care possibilities, and improve access to clean water and sanitary living and working conditions. Funding for disease prevention and control attempts to empower a country’s health community to

¹⁴ “IDA: Providing for a Healthier Population.” *The World Bank*. Available online: <http://www.worldbank.org/ida/idahnp.htm>. 2002.

¹⁵ Ibid.

respond to epidemics such as AIDS and malaria outbreaks through education campaigns and national communication infrastructure. Lastly, multilateral aid supports programs to curb the persistence of non-communicable diseases such as tobacco and other substance addiction through advertising and public health campaigns aimed again at education.

IV. Building a health-response aid allocation model

Though the mechanics of the unidirectional causality between public health development and poverty alleviation remains to be definitely proven, empirical evidence that the World Bank allocates health-related project aid on the basis of health indicators as well as political independent variables strongly supports the hypothesis that the World Bank views health infrastructure development as a necessary component of poverty elimination. As the representative multilateral institution committed to altruistic motives for development assistance, the World Bank has considered other causal links between financial flows and individual welfare. In addition to health infrastructure development, the World Bank has targeted education, population control, private investment, government responsibility and corruption reduction, and legal system development in the developing world through its foreign aid programs. While it is beyond the scope of this research project to consider all potential causal links between multilateral development assistance and poverty alleviation, evidence of World Bank support for health development as one causal link does not weaken the potential impact of other such links. The Bank has repeatedly asserted that health development is one of many targeted areas for improvement that must be addressed before empirical research will uncover reductions in poverty levels.

As the development literature has demonstrated, bilateral donors respond robustly to political and geo-strategic factors when allocating foreign aid disbursements both within sub-Saharan Africa and elsewhere in the developing world. Work on multilateral aid allocation by Sachs and Warner (1995) has shown that international lending and grant-disbursing institutions are not immune to political motivations, though they differ in substance from the vast majority of bilateral donors.¹⁶ Rather than seeking to reward former colonies, military allies, or political supporters in the United Nations, the World Bank tends to reward potential aid recipients consistent with its political goals of international engagement and stability. In practice, holding other allocation motives constant, the World Bank tends to give more development assistance to countries that are more involved in the international trading system and impose fewer restrictions to the cross-border flow of goods and services. Moreover, the World Bank allocates fewer financial resources to developing countries that are engaged in civil war or ethnic conflict both to discourage regional instability but also owing to concerns about the efficacy of development programs in war-torn or otherwise unstable environments.¹⁷

As an integral component of the aggregate International Development Agency development assistance program, health development programs should likewise favor countries that are both more open and more stable. In examining empirical evidence on health program aid allocation, this model will control for these motives common to all multilateral aid flows. Furthermore, the preponderance of criticism of the World Bank's foreign aid policy in Africa has focused on the disconnect between aid allocation

¹⁶ Sachs, J. D. and Warner, A. M. *Economic reform and the process of global integration*. Brookings Papers on Economic Activity, 1-118. 1995.

¹⁷ See also Sachs, J. D. and Warner, A. M. *Sources of slow growth in African economies*. Journal of African Economies, 6(3), October, 335-376. 1997.

decisions and per capita income levels as the standard measure of poverty. While Boone (1994, 1996) echoes the debate over the existence of any such correlation between aid allocation and per capita income levels, this paper will control for per capita income levels to allow health programs specifically to respond to poverty levels irrespective of the aggregate response of all development assistance.

If health assistance allocation can be explained entirely in terms of a desire to promote trade openness and regional military security, the World Bank would not specifically endorse the health channel of poverty alleviation. Rather, this model evaluates the extent to which pre-existing health infrastructure and institutional commitment and ability offer additional explanatory power over the allocation decisions of IDA health programs. By including independent variables that measure health developments at the beginning of the period considered, I can assess the marginal impact of the anticipated success of health development projects on allocation decisions. Furthermore, to reflect the bureaucratic inertia and institutional necessity to disburse the full amount of funds available, I will also consider the previous degree of IDA commitment by country. Statistically significant coefficients on health indicators at the beginning of the considered allocation period (1991-2001) indicate that in addition to promoting openness and stability, health development assistance projects are specifically targeted at countries with the highest likelihood of future success based on strong past performance in the area of health system development.

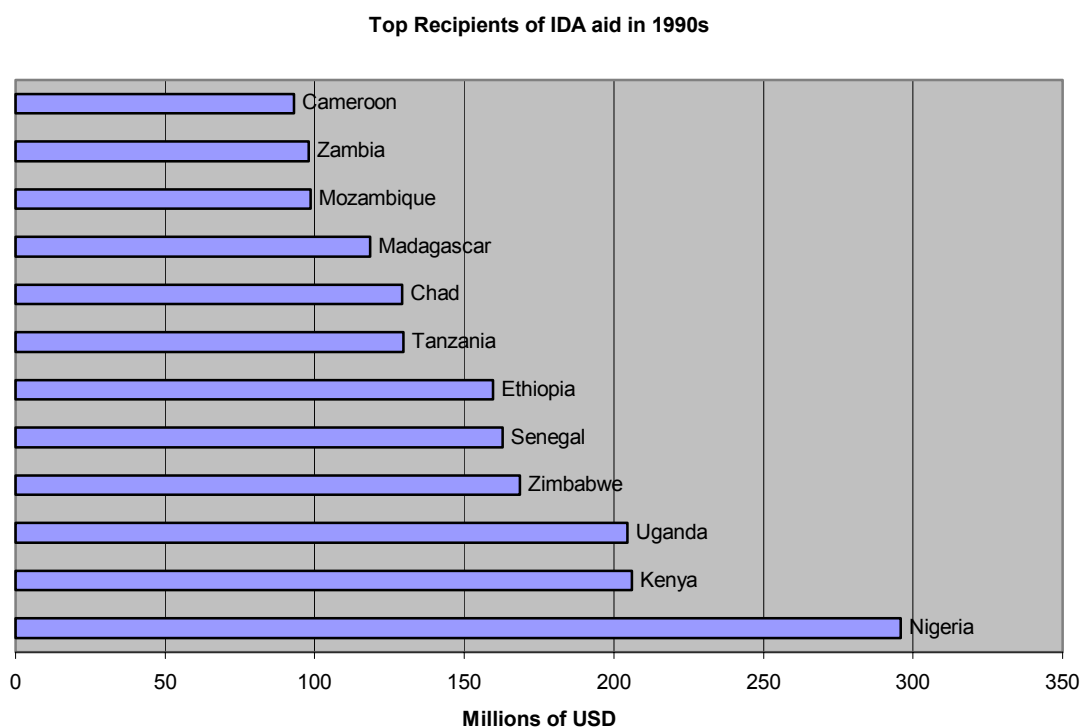
V. Case selection and data availability

This model considers cross-sectional data for forty-seven sub-Saharan African countries over the period 1991-2001. Though reliable data on the quantity and direction of IDA aid flows over this period is readily available, observations on the independent health indicator variables is rarely available in time-series format. Therefore, this research will consider the determinants of aggregate decade averages of aid flows delineated into instances by country rather than aid project. Aid projects necessarily reflect the degree of existing health infrastructure development within the recipient country and also the degree of government resolve to focus on health development in the future. Proxy variables measuring both decade average levels of public health indicators government commitment and effectiveness vary within the data across country rather than aid project. To avoid unnecessarily weakening the explanatory power of the independent variables in the regression model, I will consider aid flows by country rather than by aid project.

As the dependent variable in my regression model, I will use levels of International Development Agency development assistance projects classified as “Health, Nutrition, and Population” summed by country instance from 1991-2001. Given that IDA programs frequently last for a multiyear (or unspecified) length of time, I will consider only aid projects that initially received funding over the considered time period while excluding holdover projects that initially received financial disbursements in the previous decade. I have excluded health programs not aimed at any specific recipient country but rather continent-wide institutional development. Grouping remaining IDA-funded health programs by recipient countries and summing the total disbursement commitment in the

year of origination yielded 47 observations on the dependent variable IDA_90S. In a subsequent model that considers aid per capita as the dependent variable, I define IDACAP_90s and IDACAP_80s as the amount of health development assistance in constant 1995 USD divided by the total population of the recipient country.

*Chart B. Selected levels of IDA health project flows during the 1990s*¹⁸



I consider representative indicators of health infrastructure development and institutional commitment and effectiveness as my independent variables to assess the extent to which positive health developments can influence aid allocation decisions. Given difficulty in obtaining time series data on health infrastructure development, this model will consider the state of each country's health system at the beginning of the allocation period considered (1991-2001). A positive correlation between improvements

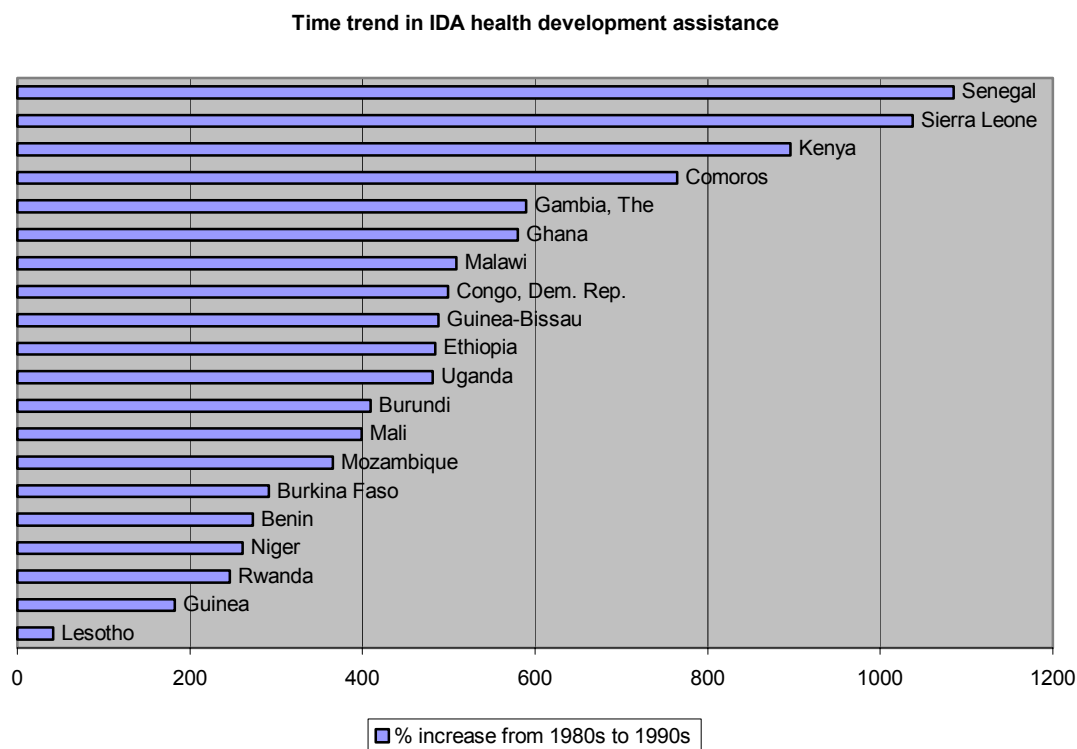
¹⁸ World Bank Development Indicators, 2001.

in health indicators over the 1990s and increased multilateral aid flows raises the previously stated causality question: does the World Bank respond positively to improvements in health or are the improvements in health indicators evidence of real-time effectiveness of already allocated World Bank aid? To avoid this causality debate, this model will consider initial health indicators at the time of the earliest funding allocation decision in the dataset (1991).

While the accompanying dataset is strictly cross-sectional, the aggregation component of the dependent variable suggests a panel dataset. For reasons already stated, poor availability of time series data on cross-sectional health indicators precludes construction of true panel data; nevertheless, theory of institutional budget allocation suggests that development assistance (health or otherwise) should be highly influenced by previous budgetary commitment.¹⁹ The independent variable IDA_80S captures the response to present health-related development expenditure to lagged expenditure. Constructed analogously to the dependent variable IDA_90S, IDA_80S aggregates health and nutrition development assistance projects initiated during the 1980s differentiated by country. We expect a statistically significant positive coefficient on IDA_80S to confirm that present foreign aid for health projects are positively influenced by previous International Development Agency commitment in a particular recipient country. The theoretical justification for this hinges on both the compulsion within the World Bank to allocate all available resources and also the inertial desire to see a health project through to fruition; that is, insignificant improvement in health indicators following a World Bank funded health project could simply indicate that the project did not occupy a suitably long time horizon and that future funding is necessary for appreciable success.

¹⁹ Lancaster, Carol. Georgetown University. Interview 22 March 2002.

Chart C. *Impact of previous commitment on current IDA flows*²⁰



We define the independent variables INFMORT90 and INFMORT99 as the number of deaths by infants less than one year of age as a ratio of each thousand births in the sample year.²¹ Scaled from zero to one thousand, a higher score indicates a higher rate of infant mortality and thus a weaker or less widely accessible public health system. To consider allocation issues beginning in 1991, we anticipate the significance of the coefficient on INFMORT90 will have explanatory power over the funding allocation decision while the coefficient on INFMORT99 (if significant) might help explain to effectiveness of health programs undertaken during the 1990s. We expect a statistically significant non-zero coefficient on INFMORT90 to indicate that health development assistance responds to pre-existing health conditions within the recipient country. A

²⁰ World Bank Development Indicators, 2001

²¹ Ibid.

positive coefficient indicates that the World Bank channels less aid in absolute terms to countries with higher rates of infant mortality, while a negative coefficient indicates that the level of health project funding and initial levels of infant mortality are inversely related. Publications of the International Development Agency suggest that aid allocation considers a potential recipient country's pre-assistance commitment to public health development. In the absence of World Bank funding, lower levels of infant mortality indicate a more deeply established and more accessible system of public health available to the citizens of the recipient country; based on interest in rewarding countries already committed to public health and reasonable expectations that health projects will prove more beneficial in countries that have already made progress in terms of health policy, we anticipate a negative coefficient on INFMORT90 to indicate that holding all other factors constant, countries with higher infant mortality levels (and hence weaker pre-period health infrastructure) will receive less funding for health projects.

The United Nations Statistical Division estimation of life expectancy by country constitutes the independent variable LIFEEXP.²² Based on a commitment to promote positive health infrastructure development and government resolve to increase effective public health expenditure, we would expect LIFEEXP to display a positive coefficient indicating that the World Bank allocates more health-related project aid to recipient countries with longer average life expectancy measured in years (and hence more pervasive health infrastructure).

MSFFOR and MSFNAT investigate the connection between official multilateral development assistance and the prevalence of international health-related non-

²² United Nations Statistics Division. Available online: <http://www.un.org/Depts/unsd/social/health.htm>.

governmental organizations.²³ Based on 1990s reports by the health NGO *Médécins sans Frontières*, MSFFOR and MSFNAT measure the number of foreign and national local health personnel working on infrastructure development in the aid receiving country, respectively. Accurate time series data on the number of NGO health workers within any particular country is seldom available. This paper uses MSF prevalence as a proxy for all foreign health-related NGOs based on its continent-wide reach and reliable published data on the number of operating health workers.²⁴ Health infrastructure development and successful implementation of IDA health projects require trained medical personnel and technicians on the ground to oversee and complement their implementation and also to train local health practitioners to insure self-sustainability of the project. A higher number of independent health personnel operating in a country intuitively suggests a greatly likelihood that a health program disbursement to that country would be successful, predicting that recipient countries with greater quantities of health personnel and relief workers will receive greater quantities of health project funding. MSFFOR and MSFNAT should display positive coefficients.

Nevertheless, MSFFOR and MSFNAT capture an incomplete picture of the total number of experienced health personnel working on health system development and disease treatment and prevention within a potential recipient country. DOCTORS and NURSES respectively measure to number of physicians and nurses per 100,000 people working within a country regardless as to employer, specialization, or country of origin.²⁵

Building on previous development research into the correlation between bilateral foreign aid disbursements and political freedom within the recipient country, we consider

²³ Doctors without Borders. Available online: <http://www.doctorswithoutborders.org>.

²⁴ MSF operates within 31 of the 47 sub-Saharan Africa case countries considered.

²⁵ World Health Organization. Available online: <http://www.who.int>.

Freedom House's FREEDOM indicator that scales the degree of political freedom in each world country between 1 (very free) to 8 (not free).²⁶ Alesina and Weder (2000) concluded that both bilateral and multilateral foreign aid flows were statistically unresponsive to changes in corruption or political freedom; therefore, we should expect IDA health project loans might display a similar unresponsiveness with regard to differing levels of political freedom.²⁷ A negative coefficient (higher values of FREEDOM indicating greater degrees of political repression being associated with lower aid allotments) would indicate that the IDA views political freedom as uniquely necessary for the success of health-related projects though empirical research indicates multilateral donors either do not view freedom as requisite for aggregate success of aid projects or other political considerations trump freedom in the allocation decision making process.

The International Development Agency claims to allocate health project aid to countries that display the institutional capacity to make productive use of the financial transfers; that is, IDA aid should favor countries with more effective governmental institutions that can expedite the appropriate use of the aid disbursement. This paper takes the World Bank Government Effectiveness Indicator (GOVEFF) as our main proxy for institutional effectiveness and ability to expeditiously develop better health infrastructure with the foreign aid received.²⁸ Scaled between -2.5 and $+2.5$, a lower GOVEFF implies the government of the recipient country completely lacks the resources to make effective use of aid money channeled through official sources while a positive GOVEFF score reflects a stronger institutional commitment to the effectiveness in-country allocation of

²⁶ Freedom House. "Country ratings." Available online: <http://www.freedomhouse.org>. 2002.

²⁷ Alesina, A. and B. Weder. "Do Corrupt Governments Receive Less Foreign Aid?" NBER. 2000.

²⁸ World Bank and C. Lancaster, Georgetown University. 22 March 2002.

health aid. Our proxies for institutional commitment and responsibility include VOICE, the World Bank Democratization Indicator that reflects the degree to which political dissent is tolerated within the governing party and/or system. Like GOVEFF, VOICE is scaled between -2.5 (dissent not tolerated) and $+2.5$ (dissent welcome). Based on IDA's intent to allocate development assistance where it can be used most effectively, we would expect indicators of greater institutional commitment and responsibility to accompany larger aid disbursements given the aid projects rely on public mechanisms for disbursement. In the case of extra-governmental (entirely private) health projects, we anticipate an insignificant coefficient on the degree of government effectiveness.²⁹

To control for the overarching motivations already discussed common to all multilateral development assistance, we use indicators that measure the recipient country's trade openness, obstacles to the free cross-border flow of goods and services, and civil unrest or demographic stability. An aggregate trade indicator TRADE measures to additive percentages of a country's aggregate production that flow across international borders; that is, TRADE measures the simple sum of both imports and exports as a share of GDP scaled against a theoretical high score of 200%. To quantify restrictions to international trade flows, this paper will apply the research of Sachs and Warner (1995) on openness as a determinant of bilateral and multilateral aid allocation. The dummy SWOPEN uses Sachs and Warner's coding of 1 for countries without significant impediments to cross-border trade and 0 for countries with such restrictions. As a proxy measure of regional instability, this model will also control for the number of refugees and displaced persons estimated to be living within the recipient country (REFUGEES)

²⁹ Incomplete data series on the observations for GOVEFF and VOICE necessitate separate regressions to avoid unnecessarily shrinking the dataset. Given insignificant coefficients on these controls in the unrestricted models, we can feel justified removing them in later models.

and the number of annual asylum seeks (ASYLUM) as reported by the United Nations High Commissioner for Refugees.³⁰

VI. Regression and results

I first consider five models to deduce the explanatory power of health infrastructure, income, and previous commitment on health development assistance during the 1990s. Regressing IDA_90s on previous health commitment, health progress indicators, and political control variables yields highly statistically significant coefficients on IDA_80S, INFMORT90, and GNP_CAP. (See column 1 of Table 2) The significant and positive coefficient on IDA_80S suggests that a higher degree of health project commitment during the 1980s translated into a higher health program disbursement in the 1990s. Particular significant is the magnitude of the coefficient on IDA_80S relative to 1. A coefficient of 1 would indicate that the IDA sought to maintain a constant degree of commitment from 1980-2000; that is, we would expect a coefficient less than or equal to 1 to describe a stationary series. The OLS estimator coefficient of $2.51 > 1$ likely suggests an omitted variable bias in the model specification.

As anticipated, the initial level of infant mortality in 1990 shows a significant negative relationship with IDA health project funding during the 1990s. Given that higher rates of infant mortality reflect weaker and less accessible public health systems, the World Bank allocated more health infrastructure funding through the 1990s to countries with stronger existing public health infrastructure as measured by infant mortality. LIFEEXP displays the expected negative coefficient, though that value lacks any statistical significance.

³⁰ United Nations High Commission for Refugees. Available online: <http://www.unhcr.ch>.

Health disbursements do show the expected positive sign with regard to the number of foreign MSF workers operating within the country though the coefficient is insignificant. Furthermore, despite well-established political motives of promoting openness and the destruction of barriers to trade, health program allotments appear unresponsive to differing levels in the Sachs/Warner openness dummy. Nevertheless, per capita income GNP_CAP displays a highly significant negative relationship with 1990s IDA health aid allocation. A higher average level of individual income translates into a lower development assistance package for health infrastructure development, indicating that the IDA chose to target slightly more health aid to slightly poorer recipient countries.

An alternate model (column 2, Table 2) attempts to explain IDA_90S through the recurring IDA_80S, INFMORT90, and GNP_CAP explanatory independent variables, but also considers the potential influence of changes in openness, health personnel, and World Bank measured government effectiveness. The coefficient on INFMORT90 remains strongly significant and negative, indicating that IDA_90S responds robustly and inversely to changes in pre-existing public health system development as quantified by infant mortality rates. GNP_CAP also retains a statistically significant negative coefficient, indicating that recipient countries with higher average income tend to receive less absolute aid.

This model also indicates a positive correlation between first differential increases in health personnel operating within the recipient country and IDA aid flows to health projects in that country. Through a standard T-test, we can reject with 90% confidence the null hypothesis of a zero coefficient on both DOCTORS and MSFFOR though we fail to reject that the OLS estimated coefficient on MSFNAT is significantly different from

zero. Statistical evidence that while holding other factors constant the IDA allocates relatively more absolute aid to countries with greater quantities of health workers could suggest that the IDA views a large health technician community as requisite for successful aid projects. A positive coefficient on MSF alone might also suggest that both the IDA and MSF are motivated by a third altruistic impulse, both taking an interest in a particular recipient country owing to outstanding health needs or humanitarian crises within that countries. While this econometric model offers no definitive refutation of this view, the co-existence of a positive coefficient on DOCTORS indicates that a higher incidence of domestic health workers (DOCTORS includes mostly local personnel) also boosts health development assistance. Given greater restrictions on the free mobility and work of domestic health personnel, we can assume that local health workers measured by DOCTORS can respond to humanitarian need less effectively than their international counterparts. Thus, the strong correlation between a theoretical increase in DOCTORS and IDA_90S suggests that the IDA specifically chooses to invest in countries with a stronger medical community.³¹

A third model (Table 2 Column 3) regresses the same dependent IDA_90S on the additional explanatory variables of political freedom, restrictions to cross-border trade, and a government effectiveness indicator to assess the International Development Agency's response to institutional commitment to the health development process. Though IDA_80S and INFMORT90 remain robust to model uncertainty, T-tests allow us to reject the null hypothesis of individual non-zero coefficients on FREEDOM,

³¹ The greatly reduced number of observations on all variables in this regression model can be attributed primarily to data collection problems with the World Bank GOVEFF variable. Insufficiencies in this single indicator of government effectiveness preclude its recurring use through our explanatory models, as many country studies have reliable health infrastructure data available even in the absence of a GOVEFF rating.

SWOPEN, and GOVEFF. An F-test of the joint null hypothesis of non-zero coefficients on FREEDOM, SWOPEN, and GOVEFF yields a test statistic of 0.745 with a corresponding p-value of 0.537.

Wald Test:

Null Hypothesis: C(5)=0 FREEDOM

C(6)=0 SWOPEN

C(7)=0 GOVEFF

F-statistic	0.744911	Probability	0.537326
-------------	----------	-------------	----------

Thus, we must fail to reject the null hypothesis that initial political freedom, trade openness, and government effectiveness in unison have no explanatory power over IDA health project allocation. This empirical finding reconfirms the apolitical motives of IDA health-related foreign aid.

Lastly we consider two regression models (Table 2 Columns 4-5) with IDA_90S as the dependent variable that evaluate the potential explanatory power of political instability measured by the humanitarian indicators REFUGEES and ASYLUM. IDA_80S, INFMORT90, and GNP_CAP as expected retain their statistical significance and anticipated sign directions. T-tests on both the coefficient for REFUGEES and ASYLUM in each regression model fail to reject the null hypothesis of a zero coefficient on these UNHCR variables of regional instability and demographic shift. These models offer little contest to our hypothesis that though the International Development Agency may consider refugee issues with its aggregate aid allotment, refugee considerations and asylum applications have no explanatory power over health project aid allocation during the 1990s.

VII. Sensitivity Analysis

In order to control for the size effect of recipient countries, I can either introduce population as an explanatory variable in the above regression models or rerun these regressions in terms of aid per capita rather than absolute aid amount. Table 3 considers five models of health development assistance allocation with the additional controlling variable POP1990.³² IDA_80s, INFMORT90, and GNP_CAP as well as POP1990 are all found to be again statistically significant. IDA_80S retains its positive sign, while INFMORT90 and GNP_CAP retain the negative sign found in Table 2. The introduction of the additional explanatory population variable nevertheless weakened the marginal impact of changes in health infrastructure and income. In absolute value terms, both the coefficient on INFMORT90 and on GNP_CAP declined with the introduction of the controlling population variable. Other indicators of public health development, foreign aid worker commitment, and demographic stability are insignificant in these models that control for population. Nevertheless, previous commitment, infant mortality, and per capita income retain their significance and sign; that is, IDA_80s, INFMORT90, and GNP_CAP are robust to the potential size impact on aid allocation.

Table 4 considers the regression of per capita health development assistance IDACAP_90s on explanatory variables for health infrastructure development. IDACAP_80s, INFMORT90, and GNP_CAP retain the correct signs and are still significant in a majority of the regression models considered. The absolute value magnitude of the coefficients on INFMORT90 and GNP_CAP logistically decreases

³² Given the long time horizon of assistance projects, dividing aid over the 1990s by the population in 1990 is not a perfect representation of aid per capita. I also considered dividing aid by the average population over the 1990s with no significant impact on results.

owing not to weakened explanatory power but the reduced scale of the dependent variable IDACAP_90s.

In order to evaluate the robustness of this model specification, I expand my dataset for the purpose of this sensitivity analysis to include those countries not in sub-Saharan Africa that received World Bank health development assistance over the 1990s. To be consistent with the model specification, I discard those countries that received World Bank aid solely under the auspices of the International Bank for Reconstruction and Development (IBRD). Twenty-seven countries outside of sub-Saharan Africa have positive (non-zero) values for the total amount of IDA health development assistance received from 1991-2001.³³ To assess the potential impact of geographic location within sub-Saharan Africa, I introduce the dummy variable D(AFR) set to 1 for those countries in my initial model specification located in the region and 0 for all others.

Table 5 presents five regression models for this expanded dataset of all countries that received health development assistance during the 1990s as well as those countries of sub-Saharan Africa that received no health aid over this period. In each model, IDA_80S, INFMORT90, and GNP_CAP retain their significance (at the 95% level of greater). Infant mortality rates display a consistent negative sign, confirming that positive public health development translates into higher health project assistance irrespective of region. Per capita income retains its negative sign, maintaining that greater need as captured by individual income results in greater health aid disbursement. Given the unavailability of the Sachs-Warner openness indicator for the countries considered in this expanded

³³ Albania, Armenia, Azerbaijan, Bangladesh, Bolivia, Bosnia-Herzegovina, Cambodia, China, Egypt, Georgia, Honduras, India, Indonesia, Kyrgyz Republic, Laos, Macedonia, Moldova, Nepal, Nicaragua, Pakistan, Philippines, Samoa, Solomon Islands, Sri Lanka, Tajikistan, Vietnam, and Yemen.

model, I employed TRADE as a proxy for openness. Models (2) and (5) suggest that countries with a larger trade share will receive marginally less aid.

The dummy variable D(AFR) exhibits clear significance at the 99% level for all models considered. Controlling for previous commitment, income, and public health development, potential recipients countries in sub-Saharan Africa still receive substantially larger aid allotments, potentially reflecting the political primacy of African health in development assistance allocation decisions.

Table 6 introduces interaction terms between the D(AFR) regional dummy and the main indicators IDA_80s, GNP_CAP, and INFMORT90. With the addition of these interaction terms, INFMORT90 and GNP_CAP become insignificant though the interaction terms INFMORT90*D(AFR) and GNP_CAP*D(AFR) are robustly significant in each model considered. This suggests that per capita income and health infrastructure development (as captured by infant mortality) only influence health aid allocation decisions for countries in sub-Saharan Africa. The lagged value of IDA health development assistance IDA_80s remains strongly significant both for countries from sub-Saharan Africa and the additional countries from other geographic regions; moreover, the additional observations contained in the models of Table 6 considerably lowered the magnitude of the coefficient on IDA_80s. This coefficient value less than one supports the intuitive hypothesis that foreign aid disbursement should be a stationary series. Thus only previous commitment continues to have strong explanatory power over health aid allocation in this expanded dataset. The dummy variable D(AFR) displays robust significance, suggesting that controlling for all other factors, recipient countries in

sub-Saharan Africa will still receive marginally more health-related development assistance than recipients located outside the region.

VIII. Policy implications for future World Bank foreign aid

The direction of the coefficients on the health infrastructure and income variables offers a paradoxical long-term solution to poverty alleviation. One might assume that if the World Bank sought to ameliorate living conditions for the world's poorest citizens, it would target its foreign aid disbursements strictly at the poorest countries – that is, those countries with the lowest per capita income and the poorest health infrastructure. Yet this empirical model suggests that while the World Bank targets more aid to countries with a relatively lower standard of living in terms of per capita income, it also target health development assistance to countries with stronger pre-existing health infrastructure.

Controlling for political goals and factors likely to influence the effectiveness of all foreign aid project, the significance of per capita income and infant mortality in health aid allocation indicates that the World Bank has chosen to target *potential effectiveness* in addition to *need* when disbursing its foreign aid disbursements over the past decade. Irrespective of any motives to engage recipients in the international trading system or to reward countries that promote regional stability, the World Bank gives proportionately more health assistance to countries poorer countries with better public health systems. Sub-Saharan countries with a higher previous World Bank commitment to health development, lower infant mortality rates, more doctors, more foreign aid workers, and lower income received more IDA health development assistance during the 1990s than their neighbors with weaker infrastructure. The World Bank has allocated its financial

resources consistent with reasonable projections of efficacy; that is, the World Bank can easily assume that countries that have already started multilaterally financed health programs and a stronger public health network will respond more expeditiously to additional health development aid.

Rather than disbursing aid strictly to the poorest potential recipients, the World Bank may have targeted countries with greater health infrastructure development in order to test the effectiveness of health development as a causal link to poverty alleviation. Over the past twenty years, international financial institutions and bilateral lenders alike have considered a plethora of potential links between foreign aid and lowering poverty levels: promoting private investment, encouraging domestic savings, engaging recipients in trade and political organizations, promoting regional stability, and furthering education to name a few. Without suggesting that health infrastructure development in isolation might serve as this long-sought causal connection, successfully establishing an empirical connection between stronger public health and lower poverty levels would allow foreign aid lenders to reallocate resources away from ineffectual programs to health programs. Instability and other warfare indicators excluded from this model might suggest why several of the sub-Saharan African countries with the highest infant mortality rates currently receive no health assistance from the World Bank. Given that the World Bank (or any bilateral aid source) has limited financial resources, a positive response of poverty levels to health developments in those countries currently enjoying assistance would provide strong ground for the Bank to extend its health development assistance to countries without an established public health system despite regional instability. Prior to committing the substantial resources necessary to raise health standards in the poorest

reaches of the continent, the World Bank must first gather evidence that health development must precede poverty alleviation.

IX. Conclusion

Empirical evidence from the allocation of health development assistance to sub-Saharan Africa during the 1990s suggests that recent criticism of the World Bank may have failed to specifically consider the motives underlying health development assistance over the 1990s. Based on data from forty-seven sub-Saharan African countries, this paper has established that IDA aid disbursements for health development projects have responded robustly to previous multilateral commitment, positive initial health infrastructure levels, and per capita income in the recipient country. Furthermore, the promotion of trade openness and regional stability -- both broad political objectives of multilateral aid and factors likely to influence the effectiveness of any aid project -- have no additional explanatory power over the allocation of health program aid. Empirical evidence suggests that rather than directing health-related foreign aid unequivocally at those countries with the greatest need (the lowest per capita income), the World Bank has also considered the pre-existing development of public health systems when allocating foreign aid disbursements over the 1990s.

Previous IDA commitment, health infrastructure, and per capita income indicators remained robust to numerous additional model specifications, including the addition of population control variables. Though previous IDA commitment remained robustly significant in the enlarged dataset of countries from outside sub-Saharan Africa,

indicators for infant mortality and per capita income exhibited statistical significance only in interaction with a regional dummy variable.

By targeting those countries with stronger health systems, the World Bank has allocated its health aid relative to the reasonable expectation of success. Clearly, a country with more foreign aid workers or doctors or access to medical supplies will be more able to take advantage of health-related aid than a recipient country without the foundation for further health improvement. Targeting aid based on effectiveness in addition to need confirms a strong desire within the World Bank to establish health infrastructure as a necessary (if insufficient) causal connection between financial transfers and poverty alleviation. If poverty decreases in the targeted countries based on health assistance, the World Bank (amongst other lenders) will be able to redirect ineffectual foreign aid programs into health assistance for the poorest countries.

A firm endorsement of health infrastructure development as a causal link to poverty alleviation will require additional research on the micro effects of health projects accounting for the transmission lag between fund disbursement and effect on income. Only after the health development programs of the 1990s are allowed to have their effect on poverty levels will the development community be able to appropriately evaluate health development as a component of foreign aid.

X. Appendix A: Charts and Tables

Table 1: Variable definitions and sources

<u>Name of variable</u>	<u>Description</u>	<u>Source</u>
IDA_90S	“Health, nutrition, population” project funding beginning 1991-2001 aggregated by country	World Bank
IDA_80S	Health project funding initiated 1981- 1990	World Bank
IDACAP_90s	IDA_90s per population	World Bank
IDACAP_80s	IDA_80s per population	World Bank
INFMORT90	Deaths per 1000 infants under one year old	World Health Org.
LIFEEXP	Life expectancy at birth	United Nations
DOCTORS	Physicians per 100,000 pop.	United Nations
NURSES	Nurses per 100,000 pop.	United Nations
MSFFOR	<i>Doctors without Borders</i> foreign health workers	MSF
MSFNAT	<i>Doctors without Borders</i> national/local health workers	MSF
FREEDOM	Political freedom index (1=free, 8=not free)	Freedom House
GOVEFF, VOICE	Government effectiveness indicator (-2.5= ineffective, +2.5= effective)	World Bank
TRADE	Imports + Exports as share of GNP	Africa Development Indicators Database
SWOPEN	Barriers to trade dummy	Sachs and Warner (1995)
REFUGEES	Displaced persons geographically within country	UNHCR
ASYLUM	Asylum-seekers by country	UNHCR
D(AFR)	Regional dummy for sub-Saharan Africa	World Bank
POP1990	Total population in 1990	World Bank

Table 2: Regression results

OLS estimation. Dependent variable: Level of IDA health project aid (1991-2001)

	1	2	3	4	5
C	184.31 (1.47)	258.63 (3.92)	279.88 (1.47)	162.04 (3.48)	165.55 (3.63)
IDA_80s	2.52 (2.65)	1.48 (1.07)	2.50 (2.17)	1.74 (1.95)	1.79 (2.00)
INFMORT90	-1.05 (-2.62)	-1.13 (-2.33)	-1.15 (-2.26)	-0.70 (-2.14)	-0.72 (-2.20)
LIFEEXP	-0.09 (-0.04)		-1.23 (-0.38)		
MSFFOR	1.48 (1.69)	1.97 (1.87)			
MSFNAT	-0.12 (-1.60)	-0.15 (-1.58)			
SWOPEN	-38.19 (-1.52)	-69.22 (-1.93)	-47.03 (-1.37)		
GNP_CAP	-0.029 (-2.65)	-0.25 (-2.91)		-0.20 (-2.53)	-0.21 (-2.65)
DOCTORS		5.76 (2.02)			
GOVEFF		42.13 (1.48)	-2.03 (-0.08)		
FREEDOM			-4.40 (-0.43)		
TRADE				-0.42 (-1.54)	-0.43 (-1.57)
REFUGEE				0.00 (1.15)	
ASYLUM					0.00 (1.16)
	35	22	28	44	44
R ²	0.36	0.42	0.22	0.31	0.31

Residuals display normality and homoskedasticity for models (1-5). *T*-statistics in parentheses. **Bold** indicates significance at the 90% level of greater.

Table 3: Regression results

OLS estimation. Dependent variable: Level of IDA health project aid (1991-2001)

	1	2	3	4	5
C	176.85 (1.74)	139.95 (3.15)	294.80 (2.51)	107.40 (2.80)	99.34 (2.65)
IDA_80s	2.00 (2.57)	1.40 (1.24)	1.62 (2.28)	1.51 (2.14)	1.55 (2.34)
INFMORT90	-0.80 (-2.41)	-0.75 (-2.08)	-0.85 (-2.68)	-0.51 (-1.95)	-0.48 (-1.88)
LIFEEXP	-0.81 (-0.50)		-2.66 (-1.31)		
MSFFOR	0.83 (1.14)	0.74 (0.81)			
MSFNAT	-0.10 (-1.61)	-0.10 (-1.17)			
SWOPEN	-18.91 (-0.91)	-20.58 (-0.83)	-23.64 (-1.10)		
GNP_CAP	-0.027 (-3.04)	-0.04 (-1.89)		-0.02 (-2.73)	-0.02 (-2.72)
DOCTORS		0.06 (0.06)			
GOVEFF			6.89 (0.44)		
FREEDOM			-4.94 (-0.79)		
TRADE				-0.20 (-0.93)	-0.17 (-0.77)
REFUGEE				0.00 (0.29)	
ASYLUM					0.00 (1.21)
POP1990	1.86E-06 (3.89)	1.96E-06 (3.58)	2.45E-06 (5.94)	2.13E-06 (4.92)	2.13E-06 (5.14)
N	35	28	28	44	44
R ²	0.58	0.52	0.70	0.57	0.59

Residuals display normality and homoskedasticity for models (1-5). *T*-statistics in parentheses. **Bold** indicates significance at the 90% level of greater.

Table 4: Regression results

OLS estimation. Dependent variable: IDACAP_90s [IDA health project aid per capita (1991-2001)]

	1	2	3	4	5
C	-11.03 (-0.65)	23.73 (1.59)	15.48 (1.47)	35.25 (2.78)	32.27 (2.58)
IDACAP_80s	1.79 (2.43)	2.83 (2.55)	2.21 (1.77)	1.12 (0.91)	1.36 (1.11)
INFMORT90	-0.01 (-0.12)	-0.01 (-1.31)	-0.01 (-0.09)	-0.20 (-2.25)	-0.19 (-2.13)
LIFEEXP	0.48 (1.99)	-0.17 (-0.73)	-2.66 (-1.31)		
MSFFOR	0.05 (0.32)	0.06 (0.54)			
MSFNAT	-0.01 (-0.96)	-0.01 (-1.38)			
SWOPEN		-1.99 (-0.54)			
GNP_CAP	-0.003 (-2.11)	-0.002 (-2.01)	0.00 (0.34)	-0.01 (-2.96)	-0.01 (-2.78)
DOCTORS			0.07 (0.18)		
GOVEFF			-0.21 (-0.06)		
FREEDOM			-1.64 (-1.22)		
TRADE	0.00 (0.11)			-0.03 (0.39)	0.04 (0.53)
REFUGEE				-2.83E-05 (-1.38)	
ASYLUM					-0.00 (-0.92)
N	42	22	22	44	44
R ²	0.27	0.32	0.15	0.14	0.12

Residuals display normality and homoskedasticity for models (1-5). *T*-statistics in parentheses. **Bold** indicates significance at the 90% level of greater.

Table 5: Sensitivity analysis
 OLS estimation. Dependent variable: Level of IDA health project aid (1991-2001)

	1	2	3	4	5
C	141.05 (1.61)	169.39 (2.12)	338.51 (4.04)	133.67 (1.53)	178.45 (2.21)
IDA_80s	0.16 (12.42)	0.17 (15.06)	0.15 (5.46)	0.17 (14.96)	0.16 (12.65)
INFMORT90	-0.63 (-2.13)	-0.80 (-2.89)	-0.67 (-2.10)	-0.64 (-2.19)	-0.78 (-2.79)
LIFEEXP	-1.29 (-1.15)	-1.60 (-1.58)	-4.15 (-3.84)	-1.28 (-1.14)	-1.62 (-1.56)
GNP_CAP	-0.04 (-4.09)	-0.03 (-3.73)	-0.03 (-3.26)	-0.03 (-4.27)	-0.03 (-3.67)
FREEDOM	-1.36 (-0.46)				-1.69 (-0.64)
TRADE		-0.56 (-3.48)			-0.57 (-3.50)
POP1990	1.07E-07 (3.05)	9.40E-08 (3.25)	1.05E-07 (1.82)	1.01E-07 (3.35)	1.01E-07 (2.99)
D(AFR) ³⁴	81.31 (4.47)	114.69 (5.59)		80.64 (4.63)	115.77 (5.44)
N	69	67	69	69	67
R ²	0.71	0.74	0.63	0.71	0.73

Residuals display normality and heteroskedasticity for models (1-5). Values shown display White heteroskedasticity-consistent standard errors. *T*-statistics in parentheses. **Bold** indicates significance at the 90% level of greater.

³⁴ A dummy variable set to 1 for countries in sub-Saharan Africa and 0 for all others.

Table 6: Sensitivity analysis with interaction
 OLS estimation. Dependent variable: Level of IDA health project aid (1991-2001)

	1	2	3	4
C	63.99 (0.76)	76.66 (0.96)	55.62 (0.65)	85.61 (1.08)
IDA_80s	0.16 (11.58)	0.16 (13.24)	0.16 (13.26)	0.16 (11.57)
INFMORT90	-0.17 (-0.65)	-0.20 (-0.74)	-0.17 (-0.63)	-0.20 (-0.74)
LIFEEXP	-0.92 (-0.83)	-1.15 (-1.12)	-0.88 (-0.80)	-1.18 (-1.15)
GNP_CAP	0.00 (0.37)	0.01 (0.65)	0.00 (0.41)	0.01 (0.65)
FREEDOM	-1.21 (-0.44)			-1.39 (-0.56)
TRADE		-0.44 (-2.65)		-0.45 (-2.64)
POP1990	1.26E-07 (3.49)	1.20E-07 (3.75)	1.21E-07 (3.78)	1.26E-07 (3.47)
D(AFR)	149.88 (3.07)	188.95 (3.45)	150.90 (3.08)	188.42 (3.44)
D(AFR)*IDA_80S	1.85 (2.24)	1.33 (1.53)	1.85 (2.25)	1.33 (1.51)
D(AFR)*INFMORT90	-0.72 (-1.99)	-0.82 (-2.14)	-0.74 (-2.04)	-0.80 (-2.10)
D(AFR)*GNP_CAP	-0.04 (-2.67)	-0.04 (-2.51)	-0.04 (-2.68)	-0.04 (-2.52)
N	69	67	69	67
R ²	0.74	0.75	0.74	0.75

Residuals display normality and heteroskedasticity for models (1-5). Values shown display White heteroskedasticity-consistent standard errors. *T*-statistics in parentheses. **Bold** indicates significance at the 90% level of greater.

Table 7: Selected correlation coefficients

	IDA_90S	IDA_80S	GNP_CAP	INFMORT90
IDA_90S	1.000000	0.260982	-0.168591	-0.381314
IDA_80S	0.260982	1.000000	-0.387429	0.208592
GNP_CAP	-0.168591	-0.387429	1.000000	-0.515421
INFMORT90	-0.381314	0.208592	-0.515421	1.000000
FREEDOM	-0.061434	0.167579	-0.196712	0.286370
SWOPEN	-0.167210	0.262965	0.048637	-0.014131
MSFFOR	0.255020	0.132022	-0.172151	0.174771
GVEFF	0.122620	0.266075	0.161900	-0.312073

	GVEFF	FREEDOM	SWOPEN	MSFFOR
IDA_90S	0.122620	-0.061434	-0.167210	0.255020
IDA_80S	0.266075	0.167579	0.262965	0.132022
GNP_CAP	0.161900	-0.196712	0.048637	-0.172151
INFMORT90	-0.312073	0.286370	-0.014131	0.174771
FREEDOM	-0.380430	1.000000	-0.242659	0.224002
SWOPEN	0.490407	-0.242659	1.000000	-0.242475
MSFFOR	-0.372118	0.224002	-0.242475	1.000000
GVEFF	1.000000	-0.380430	0.490407	-0.372118

XI. Appendix B: Bibliography

African Development Indicators Database. World Bank, 2001.

Alesina, A. and D. Dollar. *Who Gives Foreign Aid to Whom and Why?* Journal of Economic Growth, 5: 33-63. March 2000.

Alesina, A. and B. Weder. "Do Corrupt Governments Receive Less Foreign Aid?" NBER. 2000.

Beattie, Alan. "The World Bank – feeling the pressure." *Financial Times*. 28 November 2001.

Boone, P. *Politics and Effectiveness of Foreign Aid*. NBER Working Paper No. w5308. February 1996.

Burnside, C. and D. Dollar. *Aid, Policies, and Growth*. World Bank, Policy Research Dept. Working Paper No. 1777. June 1997.

------. *Aid, the Incentive Regime, and Poverty Reduction*. World Bank, Policy Research Dept. Working Paper No. 1937. June 1998.

Collier, P. and D. Dollar. *Aid Allocation and Poverty Reduction*. Policy Research Working Paper 2041. World Bank. 1999.

Doctors without Borders. Available online: <http://www.doctorswithoutborders.org>. 2002.

Easterly, William. *The Elusive Quest for Growth*. Cambridge, MA: MIT Press, 2001.

Einhorn, Jessica. "The World Bank's Mission Creep." *Foreign Affairs*. September/October 2001.

Freedom House. "Country ratings." Available online: <http://www.freedomhouse.org>. 2002.

International Development Agency. Available online: <http://www.worldbank.org/ida>.

Lancaster, Carol. *Aid to Africa: so much to do, so little done*. Chicago: University of Chicago Press, 1999. pp. 74-82.

------. Georgetown University. Interview 22 March 2002.

Sachs, J. D. and Warner, A. M. *Economic reform and the process of global integration*. Brookings Papers on Economic Activity, 1-118. 1995.

Sachs, J. D. and Warner, A. M. *Sources of slow growth in African economies*. Journal of African Economies, 6(3), October, 335-376. 1997.

United Nations High Commission for Refugees. Available online: <http://www.unhcr.ch>. 2002.

United Nations Statistics Division. Available online: <http://www.un.org/Depts/unsd/social/health.htm>. 2002.

World Bank Development Indicators, 2001.

World Bank. "IDA: Providing for a Healthier Population." Available online: <http://www.worldbank.org/ida/idahnp.htm>. 2002.

World Health Organization. Available online: <http://www.who.int>. 2002.