Are Remittances More Effective Than Aid for Improving Child Health? An Empirical Assessment Using Inter- and Intracountry Data

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This paper analyzes the respective impacts of aid and remittances on human development as measured by infant and child mortality rates. Panel data on a set of 109 developing countries and cross-country quintile-level data on a sample of 47 developing countries are alternatively used. In addition to assessing the extent to which health aid and remittances contribute to reducing child health disparities between countries, the paper addresses two other questions: What is the net effect of migration, after accounting for the brain drain of health workers? What is the effective impact of aid and remittances on intracountry child health disparities? Our results tend to show that remittances significantly improve child health and that the impact of health aid is nonlinear, suggesting that aid to the health sector is more effective in the poorest countries. By contrast, medical brain drain, as measured by the expatriation rate of physicians, is found to have a harmful impact on health outcomes. The net impact of migration on human development is therefore weakened. Finally, remittances seem to be much more effective in improving health outcomes for children belonging to the richest households, whereas neither pro-poor nor antipoor effects are found for health aid.

Poverty reduction is increasingly put forward as the main objective of official development assistance (ODA) to developing countries. National leaders and the international community have pledged to meet by 2015 a series of poverty reduction targets known as the Millennium Development Goals (MDGs).[1] The pursuit of these goals calls for dramatic increases in infrastructure finance and in the provision of basic services to the population of the developing world that ODA alone cannot achieve. The Monterrey consensus, which emerged from the United Nations International Conference on Financing for Development in that city in 2002, highlighted the need

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to find new sources of financing, and the idea that more private funds should be invested in developing countries has received strong support since then.

Given this context and an ever-increasing volume of flows from migrants, international migrant remittances have attracted considerable attention in recent years. According to the latest World Bank estimates (see Ratha et al. 2007), recorded remittances to developing countries reached US$240 billion in 2007. The actual magnitude is even larger when transfers through informal channels are taken into account. In 36 out of 153 developing countries, remittances are larger than all capital flows, public and private, and voices have already been raised here and there to call for progressive replacement of official aid by remittances.

Little is known, however, about the respective effectiveness of aid and remittances in alleviating poverty. Despite a burgeoning literature examining the impact of ODA on aggregate welfare, there exists, to our knowledge, almost no studies analyzing to what extent aid and remittances may be substitutes or how they are related to inequality and poverty reduction. Exceptions include the work of Chauvet and Mesplé-Somps (2007), who analyze the distributive impact of trade flows, foreign direct investment (FDI), official aid, and migrants' remittances using Branco Milanovic's World Income Distribution database (Milanovic 2005). The authors find that FDI increases intracountry disparities and that remittances tend to decrease them. They also find that trade and aid have a nonlinear relationship with income distribution.

The objective of our paper is to fill this knowledge gap by analyzing the respective impacts of aid and remittances on human development as measured by infant and child mortality rates. To what extent do aid and remittances help reduce child health disparities between countries? What are their respective impacts on child health disparities within countries? How do remittances compare with aid when migration costs (in the form of "brain drain") are accounted for?

We choose basic indicators of human welfare instead of a monetary measure of poverty for three reasons. First, comparable cross-country data on monetary poverty over time are extremely scarce. Second, child health figures prominently among the MDGs. Donors have committed themselves to reducing by two-thirds the mortality rate among children under age 5 (goal 4), and to this end, they have devoted an increasing share of official aid to the health sector. There is, however, very little empirical evidence on the effect of increased aid flows on health outcomes in recipient countries. Whether donors are right to prioritize the health sector in the intracountry allocation of aid is thus an unanswered question that needs to be addressed. Third, the relationship between migration and health is increasingly emphasized in the microeconomic literature, and donor agencies regularly report the success of most of their projects and programs in the health sector. It is therefore interesting to investigate whether successful health interventions from the donors' side or the migrants' side at the micro level translate into improved health outcomes at the macro level and whether Paul Mosley's micro-macro paradox also applies to the health sector (Mosley 1987).

We follow Mishra and Newhouse (2007) and use aid allocated to the health sec- [illegible] in our empirical analyses. Our implicit assumption is

that not all types of aid can reasonably be expected to affect health outcomes and that narrowing the aid variable should help us better measure the impact (if any) of official development assistance on basic indicators of human development.

Our empirical strategy relies on two econometric exercises. We first examine the respective impacts of aid, remittances, and medical brain drain on child health indicators, using panel data on a sample of 109 developing countries. We explore whether aid and remittances contribute to improving health outcomes and whether the brain drain of health workers vitiates the positive impact of remittances. This first econometric exercise raises substantial methodological issues such as measurement errors and endogeneity of our core explanatory variables, which we try to address. Keeping in mind the inherent weaknesses of this macro approach, our econometric results indicate that both remittances and health aid significantly reduce infant and child mortality rates but that the effect of health aid is nonlinear, suggesting that aid to the health sector is likely to be more effective in the poorest countries. Medical brain drain, as measured by the expatriation rate of physicians, is found to have a harmful impact on health outcomes. The net impact of migration on human development is thus diminished.

We then assess the respective effectiveness of aid and remittances in lessening health disparities within countries, using cross-country quintile-level data. The results of this second econometric exercise show that remittances are effective in reducing infant and child mortality rates, but only for the richest quintiles. This finding suggests that although remittances contribute to better mean health outcomes in recipient countries, they tend to increase intracountry health inequality. The impact of health aid, by contrast, is hardly ever significant in our within-country regressions.

The next section contains a review of the macroeconomic literature on the impacts of aid and remittances on poverty and inequality. The data, method of estimation, and results of the cross-country and intracountry analyses are presented in the subsequent two sections, followed by concluding remarks and a discussion of the policy implications of the findings.

Effects of Aid and Remittances on Poverty and Inequality: A Review of the Literature

From the early 1960s to the mid-1990s, the literature investigating the macroeconomic impact of aid focused on the link between aid and growth. The emerging picture from this literature is that aid can enhance growth but that this result is very fragile and is highly dependent on the choice of data, sample composition, and estimation methods (Roodman 2007). The adoption of the United Nations Millennium Declaration in 2000 and the obligation accepted by donors to financially support developing countries' efforts to achieve the eight Millennium Development Goals by 2015 have progressively shifted the focus from the aid-growth nexus to the relationship between aid flows and welfare or poverty indicators. This relationship is examined next, after which the effects of remittances are explored.

Poverty and Inequality Impacts of Aid

The few existing studies on the impacts of aid on poverty and inequality have adopted standard cross-country growth regression approaches, replacing growth with an indicator of welfare or poverty as the dependent variable (see, for example, Boone 1996; Mosley, Hudson, and Verschoor 2004; Gomanee, Girma, and Morrissey 2005; Gomanee et al. 2005). Because comparable cross-country data on poverty over time are extremely scarce, most studies have concentrated on the effectiveness of aid in improving human development indicators such as the infant mortality rate, the under-five mortality rate, life expectancy, and primary schooling.

In a famous paper, Boone (1996) finds no evidence that aid succeeds in improving human development indicators in recipient countries. Although aid could theoretically reduce infant mortality either through an increase in private consumption or through greater provision of public services to the poor, his results suggest that it increases the size of recipient governments but has no impact on basic measures of human development indicators. Pushing his analysis further, Boone investigates whether his result varies depending on the political regime. He finds some evidence that liberal political regimes, all else being equal, have lower infant mortality rates, which may reflect greater willingness of these systems to deliver public services to the poor.

Boone's paper has been much criticized, on two grounds. In the first place, some authors have argued that the welfare impact of aid is not direct but operates through its effect on the amount of government spending allocated to social areas. Boone's regressions would thus be inappropriately specified. Mosley, Hudson, and Verschoor (2004) estimate a system of three equations, with poverty, aid, and pro-poor expenditure as their dependent variables. They find that aid is associated with higher levels of pro-poor spending and that such spending is associated with lower poverty headcounts. Aid is also found to increase health spending, which in turn reduces infant mortality. Gomanee, Girma, and Morrissey (2005) reach the same type of conclusion, using quantile regressions. In a companion paper, however, Gomanee et al. (2005) find evidence that aid improves welfare indicators and that this effect works predominantly through direct impacts.

The second criticism is that although it may be true that aggregate aid has no impact on health, particular types of aid, including health aid, are effective in improving human development indicators (see, for example, Masud and Yontcheva 2005; Michaelowa and Weber 2007; Mishra and Newhouse 2007; Dreher, Nunnenkamp, and Thiele 2008). Mishra and Newhouse (2007), in particular, rely on a large dataset covering 118 countries between 1973 and 2004 to measure the effect of health aid on infant mortality. They estimate both ordinary least squares (OLS) regressions and a system of moment equations using the generalized method of moments (GMM) and find that increased health aid is associated with a statistically significant reduction in infant mortality. The estimated effect of health aid is small, however; since doubling health aid within a country would reduce infant mortality in the next five-year period by only 2 percent. In addition, the authors do not find any significant impact of overall aid.

Masud and Yontcheva (2005) use data on assistance from nongovernmental organizations (NGOs) and on bilateral aid to assess the effectiveness of these financial

flows on two social indicators, infant mortality and adult illiteracy. Their underlying assumption is that NGOs intervene at the grassroots level and may be more effective in alleviating poverty than other types of assistance. Using an unbalanced panel of 58 countries from 1990 to 2001, they find that health expenditure per capita reduces infant mortality, as does greater NGO aid per capita. By contrast, they do not find any significant impact of total bilateral aid on infant mortality. The authors then list a number of reasons why NGO aid might work better than bilateral aid in reducing infant mortality. First, NGO aid would be allocated more toward countries with high infant mortality rates, while bilateral aid would favor countries with lower infant mortality. Second, NGOs would have more direct links to the poor and vulnerable, which would make them more efficient. Third, in line with Boone (1996), aid transiting through recipient governments could be diverted for the benefit of wealthy elites. Pushing their analysis further, the authors find no evidence of a positive impact of NGO or bilateral aid on the share of spending on health care in total expenditure.

The few existing studies examining the links between aid and aggregate welfare as measured by human development indicators do not permit clear conclusions. Some papers find no impact at all; others find evidence that aid decreases infant mortality rates, directly, or indirectly, through higher levels of pro-poor spending. This lack of consensus in the macroeconomic literature is surprising, given the number of successful health interventions financially supported by international assistance (Levine and the What Works Working Group 2004).

Poverty and Inequality Impacts of Remittances

Despite the increasing size of remittances, empirical macroeconomic evidence on the impacts of these financial flows on poverty and inequality is even scarcer than that related to aid. Here again, the scarcity of evidence stems mainly from the lack of reliable and comparable cross-country data on several of the relevant variables, such as emigration rate by country and amounts remitted, and from the absence of the long series that are required if use is to be made of the latest macroeconometric tools. Consequently, the empirical literature is confined largely to a few case studies of villages or countries based on microeconometric data (see, for example, Leliveld 1997; Lachaud 1999; Adams 2004, 2006).

At the cross-national level, to our knowledge, only four recent studies have looked at the poverty impact of remittances: Adams and Page (2005); *World Economic Outlook* (IMF 2005); Gupta, Pattillo, and Wagh (2007); and Acosta et al. (2008). Despite strong microeconomic evidence for a positive impact of remittances on education and health (see, for example, Kanaiaupuni and Donato 1999; Cox-Edwards and Ureta 2003; Hildebrandt and McKenzie 2005; Mansuri 2007), no one has ever investigated the impact of remittances on human development indicators at a macroeconomic level.

Adams and Page (2005) use a panel of 71 low-income and middle-income countries for which data on migration, remittances, poverty, and inequality are available and test whether countries that produce more international migration or receive more international remittances have less poverty. After instrumenting for the potential endogeneity of remittances, they find that a 10 percent increase in per capita official remittances leads to a 3.5 percent decline in the share of people living in poverty. Using a broader sample of 101 countries, IMF (2005) provides further evidence that remittances have an effect on poverty. The effect, however, is rather small; on average, a 2.5 percentage point increase in the ratio of remittances to gross domestic product (GDP) is associated with a less than 0.5 percentage point decrease in poverty. As argued by the authors, this (disappointing) result could stem from the fact that average income and inequality, along with remittances, are included as regressors. Since these variables are themselves likely to be influenced by remittances, the true impact of remittances on poverty could actually be larger.

Using a sample of 76 countries in which Sub-Saharan Africa is substantially represented, Gupta, Pattillo, and Wagh (2007) adopt the same methodology as that of Adams and Page (2005) and model poverty as a function of mean income, some measures of income distribution, and remittances. Their findings indicate that a 10 percent rise in remittances is associated with a decrease of about 1 percent in the incidence of poverty. In the case of Sub-Saharan Africa, however, their results suggest that the impact of poverty on migration and remittances is greater than the impact of remittances on poverty.

Finally, Acosta et al. (2008) use both cross-country and household survey data to assess the impact of remittances on growth, poverty, and inequality in Latin America. Their cross-country estimates suggest that remittances have a positive and statistically significant effect on growth, on average, but that they tend to increase the level of income inequality. For the average Latin American country, however, the effect is different; an increase in remittances tends to be associated with lower levels of inequality. Turning to the authors' microeconometric analyses, their findings suggest that the effects of remittances on poverty and inequality vary strongly across Latin American countries, depending on whether recipients are concentrated at the bottom or at the top of the distribution of nonremittance income.

In what follows, our aim is to provide additional insights into the question of whether aid and remittances, as sources of external financing, are effective in improving child health outcomes.

Impact of Aid and Remittances on Health Outcomes: A Cross-Country Analysis

This section assesses the impact of health aid and remittances on child health outcomes, using panel data on a sample of 109 countries from 1987 to 2004. (For a list of countries in the sample, see annex table A.1.) After a brief presentation of the empirical strategy and a description of the data, the results of our baseline model are discussed. The analysis is then pushed further by testing for nonlinearities in the aid-health relationship and investigating the effect of the medical brain drain on health outcomes.

Model and Data

To explore the relative impacts of aid and migration on child health indicators, we estimate a model of the following form:

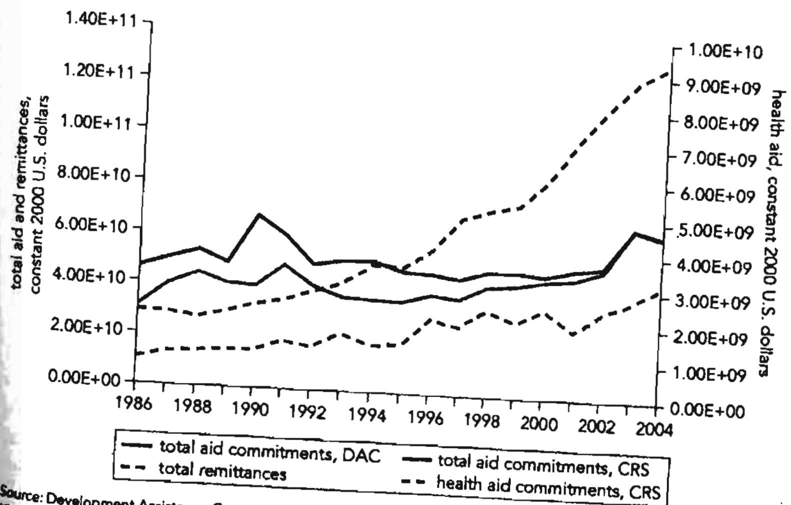
$$\ln Health_{i,t} = \alpha_i + \tau_t + \beta \ln X_{i,(t-1,t-4)} + \delta \ln Remittances_{i,(t-1,t-4)} + \theta \ln Health\ aid_{i,(t-1,t-4)} + \varepsilon_{i,t}. \quad (1)$$

$Health_{i,t}$ is either the under-five mortality rate or the infant mortality rate from *World Development Indicators* (World Bank 2006). The under-five mortality rate is the probability (per 1,000 live births in a given year) that a newborn baby will die before reaching age 5, if subject to current age-specific mortality rates. The infant mortality rate is the number of infants dying before reaching age 1, per 1,000 live births.

Since our dependent variables are bounded, we use a logarithmic transformation. To ease interpretation of our results and account for potential nonlinearities, all our independent variables are also log-linearized.

We measure $Health\ aid_{i,t}$ using aid commitments to the health sector as defined by the Country Reporting System (CRS) of the Organisation for Economic Co-operation and Development (OECD).[2] The main advantage of the CRS is that its data on aid commitments are highly disaggregated by purpose (sector). Its main disadvantage is that the data are only reliable for recent years—as reflected in figure 1 by the large underreporting of aid in the CRS data compared with data from the Development

FIGURE 1.
Total Aid, Remittances, and Health Aid, 1986–2004



Source: Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD); Country Reporting System (CRS), OECD; *World Development Indicators 2006* (World Bank 2006).

Assistance Committee (DAC) of the OECD. As noted by Mishra and Newhouse (2007), the extent of underreporting varies by sector, donor, and time period. Missing data are therefore omitted from the sample rather than treated as zero health aid. We restrict our sample to relatively recent observations, starting in the mid-1980s.[3] Figure 1 shows that the share of aid commitments to the health sector has gradually increased since the 1980s, when it was about 2 percent of total commitments; it is now about 5 percent. This increase in health aid reflects the switch in donors' priorities, notably, from aid for infrastructure to aid for social sectors, which reflects the adoption of the Millennium Development Goals.

The CRS also provides a disaggregation of disbursements by sector. Unfortunately, disbursements are even more underreported than commitments. As an alternative variable for *Health aid*$_{i,t}$, we proxy aid disbursements in the health sector by weighting total net disbursements with the share of health commitments in total commitments. *Health aid*$_{i,t}$ is expressed in per capita constant terms, using the DAC deflator.

The term *Remittances*$_{i,t}$ is defined as current transfers by migrants who are employed for more than a year in another country in which they are considered residents (World Bank 2006). We use the same deflator for remittances as for aid in order to transform this variable into per capita constant terms. As shown in figure 1, workers' remittances have been increasing in both absolute and relative terms since the mid-1980s; then, they accounted for only about 60 percent of total aid commitments, but since 2000 they have represented more than 200 percent of aid commitments, reflecting the growing importance of this financing for developing economies. The growth in remittances is partly attributable to the rise in the number of international migrants worldwide, but it also indicates that in recent years people have been shifting from informal to formal channels for sending funds. This potentially important source of measurement error is addressed in our econometric analysis. First, we include a time trend in our list of regressors in order to capture the increasing trend in remittances. Second, we control for unobservable heterogeneity among countries, hoping to account for some omitted variables that could explain simultaneously the increasing trend in remittances and the decreasing trend in child and infant mortality. Finally, this latter issue is also tackled through the instrumentation of remittances (see the next subsection).

Following the existing literature on cross-country determinants of child health outcomes, equation (1) controls for a set of relevant socioeconomic variables, $X_{i,t}$. Beginning with the work of Ravallion (1993) and Pritchett and Summers (1996), a consensus has emerged concerning the negative relationship between child mortality and national income. Female education, measured either by educational attainment or by illiteracy rates, has also been shown to be negatively correlated with child mortality (Filmer and Pritchett 1999; Anand and Bärnighausen 2004; Fay et al. 2005; McGuire 2006; Ravallion 2007). We express income per capita in purchasing power parity (PPP) constant terms (World Bank 2006) and measure female education by average years of schooling of the female population age 15 and older (Barro and Lee 2000).

Anand and Bärnighausen (2004) show that the density of human resources in the health sector is significantly correlated with child health indicators. We proxy human resources for health with the number of physicians (per 1,000 inhabitants), from [illegible] (2007).

Other cross-country determinants of child health have been identified in the literature, such as the size of the population (Mishra and Newhouse 2007), the share of urban population (Fay et al. 2005; Masud and Yontcheva 2005; Ravallion 2007), inequality indicators (Filmer and Pritchett 1999; Fay et al. 2005; McGuire 2006; Ravallion 2007), and poverty rates (Anand and Bärnighausen 2004), but none were significant in our analysis. Two other variables—ethnic fragmentation and whether the country is predominantly Muslim—were also significantly correlated with infant mortality in Filmer and Pritchett (1999) and McGuire (2006). Both are time invariant and could not be introduced in our fixed-effects analysis.

Finally, there has been an intense debate concerning the impact of public spending on health outcomes. Because our core independent variable is health aid and the impact of health aid goes through the route of public spending, we exclude the public spending variable from our analysis. Another reason is that when public spending is introduced into the regressions, we lose half of the countries in the sample.

Equation (1) is estimated on a panel of 109 developing countries, among them 39 Sub-Saharan countries, from 1987 to 2004. (See annex table A.1 for the country list.) Child health data are for every four or five years (1990, 1995, 2000, and 2004). The right-hand-side variables are averaged over three years, from $t - 1$ to $t - 4$, and are measured in logarithms. This is true for all variables except education because the Barro and Lee (2000) database on education is for every five years and is available only up to 2000. We therefore use the 2000 level of education to explain 2004 health outcomes, and so on. We control for unobservable heterogeneity with country fixed effects, α. We also include time dummies τ_t.

Endogeneity of Aid, Remittances, and Income

There are two potential sources of endogeneity of aid and remittances to child health indicators. First, aid and remittances are given purposively, and both donors and migrants are likely to take into account the child health situation when allocating their flows. Even if aid is determined at the macro level and remittances are determined at the micro level, both are likely to reflect, to some extent, the chances of survival of children. Second, there could be some omitted variables that affect aid, remittances, and child health. For example, natural disasters are likely to induce both a deterioration of child health indicators and increased inflows of aid and remittances.

We therefore instrument health aid and workers' remittances.[4] As instruments for health aid, we use a set of variables that capture historical and cultural relationships between developing countries and donor or destination countries. These variables are more likely to be exogenous to child health than any characteristics of recipient or origin countries. Specifically, we use the total aid budget of the five main donors weighted by the cultural distance between receiving and donor or destination countries (measured by whether they have the same religion) and by the geographic distance (distance to Washington, Brussels, and Tokyo).[5] As an instrument for health aid, we use health aid lagged twice. Workers' remittances are instrumented using the ratio of broad money supply (M2) to GDP because countries that are more financially developed have been found to receive larger remittances. Income per capita is also endogenous to health indicators (Pritchett and Summers 1996; Filmer and Pritchett 1999). It is instrumented using twice-lagged income per capita.

We also suspected education to be endogenous to health indicators. We tested this hypothesis, and it turned out that the exogeneity of education could not be rejected by our test. This result is partly explained by the fact that education in $t-5$ (or $t-4$) is used to explain health outcomes in t.

The excludability and relevance of our instruments being legitimate concerns here, tests for their validity (Sargan test of overidentification, test of underidentification, test of weak instruments, partial R-squared) were systematically performed.[6]

Estimation of the Baseline Model

Our estimation of the baseline model proceeds in three steps. Equation (1) is first estimated with simple OLS. We then introduce country fixed effects to take into account unobservable heterogeneity in our sample. Finally aid, remittances, and income are instrumented using two-stage least squares (2SLS), including country fixed effects and time fixed effects.[7] Instrumentation equations are provided in annex table A.2.

Regressions (1) through (6) in table 1 present the estimations of the baseline model when the dependent variable is either the under-five mortality rate or the infant mortality rate. Income per capita is highly significant and tends to reduce child mortality. The impact is quite strong: the coefficients of income in regressions (3) and (6) suggest that a 1 percent increase in income reduces child mortality by around 0.59 percent and infant mortality by about 0.50 percent. The coefficients of income per capita are interestingly close to the coefficients found by Pritchett and Summers (1996) in their instrumental variables (IV) estimation of infant mortality (around 0.3), using a different set of instruments. They are even closer for the fixed-effect estimations (0.31 in Pritchett and Summers 1996).

Surprisingly, the number of physicians is not significant in table 1 except in OLS estimations. When significant, it is negative, suggesting that a larger number of doctors implies lower child and infant mortality rates. Anand and Bärnighausen (2004) find a strong impact of doctor and nurse density on various health indicators, which in their case is more robust than in our regressions. Only in OLS estimations does female education have a significant impact on child and infant mortality rates. In table 1 the negative impact of the time dummies (1990 is the omitted time dummy) reflects the decreasing trend in child and infant mortality rates over the last two decades.

Finally, aid and remittances both have a negative coefficient in regressions (1) through (6), but, contrary to Mishra and Newhouse (2007), we find no significant impact of health aid at this stage of our empirical analysis. By contrast, remittances are found to be strongly significant in most regressions, with the expected sign. When instrumented, the coefficient of remittances is multiplied more than fourfold: a 1 percent increase in remittances decreases child mortality by 0.12 percent and infant mortality by 0.10 percent.

TABLE 1. Impact of Health Aid and Remittances on Child and Infant Mortality Rates, Baseline Model

	Child mortality rate			Infant mortality rate		
Variable	OLS (1)	Within (2)	2SLS (3)	OLS (4)	Within (5)	2SLS (6)
GDP per capita[a]	−0.553	−0.263	−0.595	−0.482	−0.218	−0.500
	(6.64)***	(3.03)***	(2.39)**	(6.49)***	(2.78)***	(2.26)**
Number of physicians per 1,000 inhabitants	−0.157	−0.032	0.048	−0.107	−0.022	0.050
	(3.93)***	(0.82)	(0.89)	(2.88)***	(0.62)	(1.04)
Female educational attainment	−0.156	0.034	−0.009	−0.151	0.049	0.004
	(1.97)*	(0.61)	(0.09)	(2.15)**	(0.95)	(0.05)
Dummy for missing education variable	−0.181	0.008	−0.217	−0.170	0.038	−0.168
	(1.82)*	(0.15)	(1.28)	(2.08)**	(0.81)	(1.08)
Remittances per capita[a]	−0.054	−0.031	−0.122	−0.045	−0.023	−0.104
	(2.37)**	(2.37)**	(2.97)***	(2.16)**	(2.09)**	(2.76)***
Health aid per capita[a]	−0.012	−0.012	−0.008	−0.009	−0.011	−0.000
	(0.60)	(1.26)	(0.31)	(0.44)	(1.29)	(0.01)
Year = 1995	−0.058	−0.102	0.068	−0.048	−0.094	0.081
	(1.74)*	(4.07)***	(1.29)	(1.64)	(4.16)***	(1.74)*
Year = 2000	−0.088	−0.198	0.032	−0.085	−0.189	0.037
	(2.14)**	(6.92)***	(1.27)	(2.27)**	(7.34)***	(1.68)*
Year = 2004	−0.139	−0.274		−0.139	−0.265	
	(2.94)***	(7.98)***		(3.24)***	(8.68)***	
Constant	8.704	6.360		7.872	5.669	
	(13.88)***	(9.30)***		(13.93)***	(9.19)***	
Fixed effects	No	Yes	Yes	No	Yes	Yes
Number of observations	358	358	237	358	358	237
Number of countries	109	109	86		109	86
R^2	0.75	0.57		0.72	0.57	
Sargan (p-value)			0.31			0.27
Underidentification test (p-value)			0.03			0.03
Income instrumentation F-statistic (p-value)			0.000			0.000
Aid instrumentation F-statistic (p-value)			0.100			0.100
Remittance instrumentation F-statistic (p-value)			0.000			0.000

Note: 2SLS, two-stage least squares; GDP, gross domestic product; OLS, ordinary least squares. Numbers in parentheses are robust t-statistics. All variables except the education variable are averages over three-year periods, from $t-1$ to $t-4$, measured in logs. In equations (1) and (4), standard errors are clustered by country.

a. Instrumented regressors in equations (3) and (5). Instruments include twice-lagged GDP per capita; twice-lagged aid; and instruments for aid and remittances in the tradition of Tavares (2003), that is, total aid budgets of the five largest donors (the United States, Japan, France, the United Kingdom, and Germany) in constant dollars, weighted by a cultural distance variable (same religion) and a geographic distance variable. The ratio of broad money supply (M2) to GDP is also included as an instrument for remittances. Tests for excludability of the instruments are available on request.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

Nonlinearities in the Aid-Health Relationship

As a next step in our analysis, we explore in greater detail the relationship between health aid and child health indicators. So far, we find no significant impact of health aid commitments. A relative consensus, however, has emerged in the literature: that aggregate aid disbursements affect macroeconomic outcomes such as economic growth in a nonlinear way.[8] Similarly, the impact of health aid on health outcomes may be nonlinear. The nonlinearity may be attributable to constrained absorptive capacity. Constrained absorptive capacity in the health sector may be proxied through an interaction of health aid with income per capita; health aid would be relatively more effective in richer countries because of their greater capacity to absorb aid.

To explore this kind of nonlinearity in the health-aid relationship, we estimate an equation of the following form:

$$\ln Health_{i,t} = \alpha_i + \tau_t + \beta \ln X_{i,(t-1,t-4)} + \delta \ln Remittances_{i,(t-1,t-4)} + \theta_1 \ln Health\ aid_{i,(t-1,t-4)} + \theta_2 \ln Health\ aid_{i,(t-1,t-4)} . \ln Income_{i,(t-1,t-4)} + \varepsilon_{i,t}, \quad (2)$$

where ln*Health aid*.ln*Income* is an interaction variable of aid with income per capita. It is instrumented using the same set of instruments as those for health aid and income per capita.

The results are presented in columns (1) and (2) of table 2. The absorptive capacity hypothesis is not supported by our results. The impact of health aid is nonlinear, but the nonlinearity suggests that aid to the health sector is more effective in poorer countries. The threshold in income per capita corresponding to a switch to harmful aid is around US$4,100 per capita (in PPP). Figure 2 depicts the effect of aid on child mortality rates below and above this income threshold, respectively. The threshold is quite high and implies that most African countries belong to the decreasing part of the relationship between health aid and health outcomes. Aid increases the child mortality rate in 8 of the 35 Sub-Saharan African countries in our sample: Botswana, Cape Verde, Gabon, Mauritius, Namibia, the Seychelles, South Africa, and Swaziland. In the remaining 27 African countries, aid tends to improve child health indicators.

It is worth noting that our baseline specification implies that we capture the direct effects of aid and remittances on child health indicators. Another channel through which aid and remittances could affect health outcomes is their impact on GDP per capita. Since GDP per capita is included among our set of regressors, this indirect impact is not taken into account. Assuming that both remittances and aid tend to improve income, we therefore probably underestimate the impact of these sources of financing on child health indicators.

An alternative way of testing the constrained absorptive capacity hypothesis is to introduce the square of health aid into the regression. A quadratic relationship between health aid and health indicators would reflect marginal decreasing returns to aid: after a given threshold of aid received, an additional dollar of aid is less effective because the country no longer has the capacity to absorb it. Aid squared is never significant when introduced into any of the regressions.[9] Moreover, its sign is negative, as is that of health aid. The absence of a quadratic relationship between health aid and health outcomes confirms our previous finding of no absorptive capacity constraint

TABLE 2. Nonlinearity in the Health-Aid Relationship, Two-Stage Least Squares (2SLS) with Fixed Effects

	Child mortality rate (1)	Infant mortality rate (2)
GDP per capita[a]	−0.355	−0.264
	(1.41)	(1.16)
Number of physicians per 1,000 inhabitants	0.023	0.026
	(0.40)	(0.49)
Female educational attainment	−0.063	−0.050
	(0.53)	(0.45)
Dummy for missing education variable	−0.305	−0.255
	(1.39)	(1.26)
Remittances per capita[a]	−0.115	−0.097
	(2.72)***	(2.46)**
Health aid per capita[a]	−0.839	−0.815
	(1.87)*	(1.99)**
Health aid per capita × income per capita[a]	0.100	0.098
	(1.85)*	(1.98)**
Year = 1995	0.071	0.084
	(1.24)	(1.62)
Year = 2000	0.044	0.049
	(1.69)*	(2.09)**
Fixed effects	Yes	Yes
Number of observations	237	237
Number of countries	86	86
Sargan (*p*-value)	0.31	0.25
Underidentification test (*p*-value)	0.04	0.04
Income instrumentation *F*-statistic (*p*-value)	0.00	0.00
Aid instrumentation *F*-statistic (*p*-value)	0.10/0.12	0.10/0.12
Remittances instrumentation *F*-statistic (*p*-value)	0.00	0.00

Note: GDP, gross domestic product. Numbers in parentheses are robust *t*-statistics. All variables except the education variable are averages over three-year periods, from $t-1$ to $t-4$, measured in logs.

a. Instrumented regressors. Instruments include twice-lagged GDP per capita; twice-lagged aid; and instruments for aid and remittances in the tradition of Tavares (2003), that is, total aid budgets of the five largest donors (the United States, Japan, France, the United Kingdom, and Germany) in constant dollars, weighted by a cultural distance variable (same religion) and a geographic distance variable. The ratio of broad money supply (M2) to GDP is also included as an instrument for remittances. Tests for excludability of the instruments are available on request.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

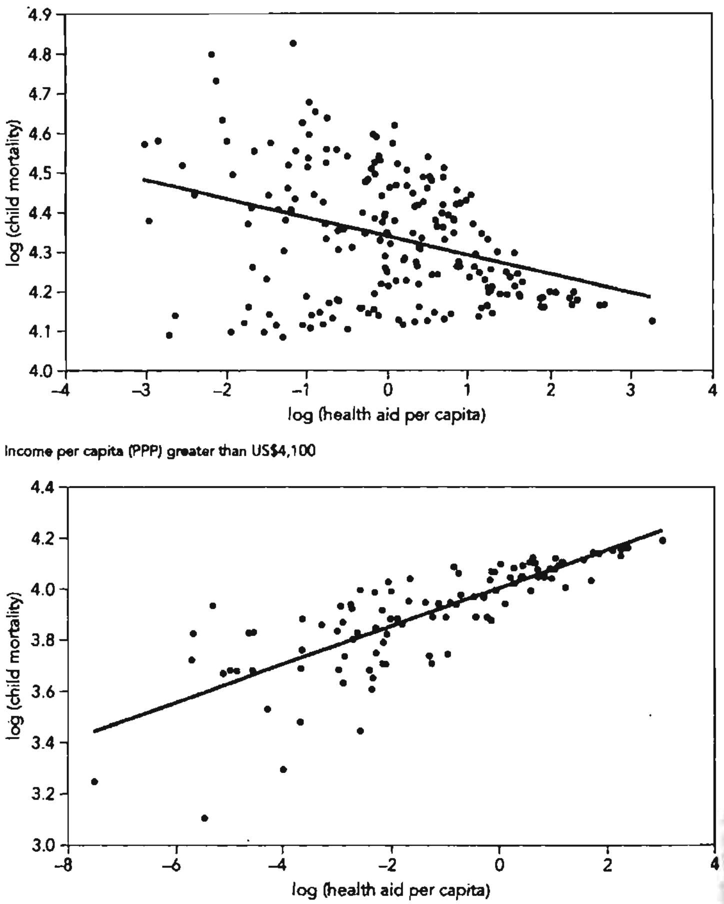
*** Significant at the 1 percent level.

on aid to the health sector. Health aid seems to be more effective where the prospects for improvements in health indicators are higher, that is, in poorer countries.

Finally, we explore whether the results using health aid disbursements are similar to those with aid commitments.[10] Regressions (1) and (3) of table 3 reproduce the baseline model; health aid disbursements are not significantly different from zero. In regressions (2) and (4), health disbursements interacted with income are significant,

FIGURE 2.
Impact of Health Aid on Child Mortality

Income per capita (PPP) less than US$4,100



Source: Authors' calculations.

confirming our previous finding. The resulting income threshold, US$4,000, is close to the one corresponding to regressions that include commitments.

Medical Brain Drain

Our baseline model suggests that migrants' remittances help improve health outcomes in developing countries. We now turn to analysis of the counterpart of workers' remittances—the impact of the brain drain induced by migration on health outcomes

TABLE 3. Impact of Health Aid Disbursements on Health Indicators, Two-Stage Least Squares (2SLS) with Fixed Effects

	Child mortality rate		Infant mortality rate	
	(1)	(2)	(3)	(4)
GDP per capita[a]	−0.619	−0.264	−0.516	−0.176
	(2.47)**	(1.00)	(2.33)**	(0.73)
Number of physicians per 1,000 inhabitants	0.044	0.039	0.046	0.041
	(0.77)	(0.61)	(0.90)	(0.70)
Female educational attainment	−0.020	−0.134	−0.005	−0.114
	(0.19)	(1.02)	(0.05)	(0.94)
Dummy for missing education variable	−0.248	−0.445	−0.194	−0.383
	(1.36)	(1.80)*	(1.16)	(1.68)*
Remittances per capita[a]	−0.124	−0.123	−0.106	−0.104
	(2.95)***	(2.70)***	(2.74)***	(2.46)**
Health aid disbursements per capita[a]	−0.028	−0.983	−0.019	−0.937
	(0.96)	(2.25)**	(0.73)	(2.28)**
Health aid disbursements per capita × income per capita[a]		0.118		0.113
		(2.16)**		(2.20)**
Year = 1995	0.061	0.075	0.075	0.088
	(1.20)	(1.38)	(1.64)	(1.79)*
Year = 2000	0.029	0.047	0.035	0.051
	(1.17)	(1.79)*	(1.55)	(2.16)**
Fixed effects	Yes	Yes	Yes	Yes
Number of observations	233	233	233	233
Number of countries	86	86	86	86
Sargan (*p*-value)	0.29	0.47	0.26	0.36
Underidentification test (*p*-value)	0.03	0.03	0.03	0.03
Income instrumentation *F*-statistic (*p*-value)	0.00	0.00	0.00	0.00
Aid instrumentation *F*-statistic (*p*-value)	0.08	0.08/0.11	0.08/0.11	0.08/0.11
Remittances instrumentation *F*-statistic (*p*-value)	0.00	0.00	0.00	0.00

Note: GDP, gross domestic product. Numbers in parentheses are robust *t*-statistics. All variables except the education variable are averages over three-year periods, from t − 1 to t − 4, measured in logs.

a. Instrumented regressors. Instruments include twice-lagged GDP per capita; twice-lagged aid; and instruments for aid and remittances in the tradition of Tavares (2003), that is, total aid budgets of the five largest donors (the United States, Japan, France, the United Kingdom, and Germany) in constant dollars, weighted by a cultural distance variable (same religion) and a geographic distance variable. The ratio of broad money supply (M2) to GDP is also included as an instrument for remittances. Tests for excludability of the instruments are available on request.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

in developing countries. More specifically, we explore the impact of the medical brain drain. Docquier and Bhargava (2007) provide a rich dataset containing information on the expatriation rate of physicians.[11] We introduce this latter variable into our model and estimate an equation of the following form:

$$\ln Health_{i,t} = \alpha_i + \tau_t + \beta \ln X_{i,(t-1,t-4)} + \delta \ln Remittances_{i,(t-1,t-4)} + \gamma MedicalBrainDrain_{i,(t-1,t-4)} + \theta_1 \ln Health\ aid_{i,(t-1,t-4)} + \theta_2 \ln Health\ aid_{i,(t-1,t-4)} \cdot \ln Income_{i,(t-1,t-4)} + \varepsilon_{i,t}, \tag{3}$$

where $MedicalBrainDrain_{i,(t-1,t-4)}$ is the expatriation rate of physicians averaged over a three-year subperiod and transformed in logarithms. Health outcomes and medical brain drain may be correlated with omitted variables such as the quality of health infrastructure. We therefore instrument this variable using the same set of instruments as for aid and remittances.

Regressions (1) and (2) of table 4 present the results when medical brain drain is introduced into the analysis. The coefficient of medical brain drain is highly significant and has the expected positive sign: a 1 percent increase in the rate of expatriation of physicians increases child and infant mortality rates by around 0.5 percent. The expatriation of human resources in the health sector has a direct, harmful effect on health outcomes in developing countries.[12]

Interestingly, the medical brain drain does not really affect the impact of health aid on health outcomes. The threshold of income for which the relationship between aid and child health switches from negative to positive remains similar to that found in table 2, between US\$4,700 and US\$5,000, and the slope does not change greatly: from −0.815 it goes to about −1, suggesting that the health-improving impact of aid is not altered when the medical brain drain is taken into account.

Intracountry Empirical Assessment

In this section, we investigate the intracountry impact of aid and remittances on child health indicators by analyzing to what extent these transfers are targeted to the poorest (or are not). The discussion begins with a description of the data and the empirical strategy and ends with comments on our main findings.

Model and Data

We use the World Bank's comprehensive Health, Nutrition, and Population (HNP) database, in which development indicators from Demographic and Health Surveys (DHSs) are compiled by asset quintiles within countries (Gwatkin et al. 2007). Asset quintiles are computed using the first principal component in an analysis of the correlations between various consumer durables and other household characteristics, following a method proposed by Filmer and Pritchett (2001).

Few studies have used the HNP database to analyze the determinants of child health outcomes. To our knowledge, the first is Fay et al. (2005). Using a sample of 39 countries and a country random-effect model, the authors assert that apart from traditional variables—such as GDP per capita, assets, education, and direct health interventions—better access to basic infrastructure services has an important impact on infant and child mortality and on the incidence of stunting. Ravallion (2007) questions the robustness of their results and criticizes their empirical strategy on three points. First, the model of Fay et al. (2005) is a linear model, but a logarithmic functional form would have been more appropriate, given that the dependent

TABLE 4. Medical Brain Drain and Health Outcomes, Two-Stage Least Squares (2SLS) with Fixed Effects

	Child mortality rate (1)	Infant mortality rate (2)
GDP per capita[a]	−0.486	−0.389
	(1.77)*	(1.56)
Number of physicians per 1,000 inhabitants	0.379	0.365
	(2.50)**	(2.67)***
Female educational attainment	−0.205	−0.185
	(0.99)	(0.98)
Dummy for missing education variable	−0.536	−0.476
	(1.49)	(1.45)
Remittances per capita[a]	−0.134	(0.114
	(2.54)**	(2.35)**
Health aid per capita[a]	−1.067	−1.033
	(2.02)**	(2.14)**
Health aid per capita × income per capita[a]	0.125	0.122
	(1.99)**	(2.12)**
Medical brain drain (MBD)[a]	0.504	0.481
	(2.61)***	(2.75)***
Year = 1995	0.093	0.105
	(1.33)	(1.64)
Year = 2000	0.086	0.089
	(2.39)**	(2.75)***
Fixed effects	Yes	Yes
Number of observations	237	237
Number of countries	86	86
Sargan (*p*-value)	0.99	0.99
Underidentification test (*p*-value)	0.07	0.07
Income instrumentation *F*-statistic (*p*-value)	0.00	0.00
Aid instrumentation *F*-statistic (*p*-value)	0.10/0.12	0.10/0.12
Remittances instrumentation *F*-statistic (*p*-value)	0.00	0.00
MBD instrumentation *F*-statistic (*p*-value)	0.01	0.01

Note: GDP, gross domestic product. Numbers in parentheses are robust *t*-statistics. All variables except the education variable are averages over three-year periods, from $t-1$ to $t-4$, measured in logs.

a. Instrumented regressors. Instruments include twice-lagged GDP per capita; twice-lagged aid; and instruments for aid and remittances in the tradition of Tavares (2003), that is, total aid budgets of the five largest donors (the United States, Japan, France, the United Kingdom, and Germany) in constant dollars, weighted by a cultural distance variable (same religion) and a geographic distance variable. The ratio of broad money supply (M2) to GDP is also included as an instrument for remittances. Tests for excludability of the instruments are available on request.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

variables are bounded. Second, by estimating a random-effect model, the authors implicitly assume that their country fixed effects are not correlated with the regressors. This is a strong assumption because many sources of latent heterogeneity across countries are suspected. Finally, there may be a strong presumption of bias arising from the omission of within-country differences in women's schooling. Using exactly the same data but estimating a fixed-effect model that includes female education and variables in log-linear form, Ravallion (2007) fails to detect any significant impact of infrastructure access on child health outcomes. His findings suggest a significant effect of access to health care and female educational attainment on child health.[13] The study by Fielding, McGillivray, and Torres (2008) employs the same data. It examines, using a system of simultaneous equations, the relationships between four MDG-related variables (health, educational status, access to water, and access to sanitation) and aid; the authors also explore the impact of aid on these variables. They find that although aid is effective overall, the poorest subgroups within each country are typically not the primary beneficiaries of the inflows.

In what follows, we use an updated HNP database in which some countries have multiple-year data. (See annex table A.3 for a listing.) This temporal dimension of the panel makes it possible to assess the impact of country-specific variables that vary over time, such as GDP per capita, aid, and remittances, in a model that includes country fixed effects. The dataset covers 47 developing countries, of which 25 are in Sub-Saharan Africa, with five asset quintiles for each country-year, yielding a total of 380 observations.

Table 5 provides summary statistics on the main variables of interest. It suggests that there are strong within-country health disparities that are correlated with asset inequality. Households belonging to the poorest asset quintile have the highest mean infant and child mortality rates; child mortality is almost twice as high for the poorest quintile as for the richest one. A similar gap can be observed in the female school completion rate, which varies from 29.15 for the poorest quintile to 76.34 for the richest. It is worth noting that the differences in mean health indicators between the poorest and richest quintiles are always smaller than the ranges across countries within each quintile.

The intracountry model to be estimated is very similar to the cross-country model presented in the preceding section in the sense that control variables are roughly the same and are expressed in log-linear form. The baseline model may therefore be written as follows:

$$\ln Health_{j,i,t} = \alpha_i + \beta \ln X_{i,(t-1,t-4)} + \nu \ln X_{j,i,t} + \delta \ln Health\ aid_{i,(t-1,t-4)} + \gamma \ln Remit_{i,(t-1,t-4)} + \sum_{j=2}^{5} \varphi_j q_j + \sum_{j=2}^{5} \tau_j q_j {}^* \ln Health\ aid_{i,(t-1,t-4)} + \sum_{j=2}^{5} \omega_j q_j {}^* \ln Remit_{i,(t-1,t-4)} + \varepsilon_{j,i,t}, \quad (4)$$

where j is the quintile index and q_j are quintile dummy variables.[14]

Vector $X_{i,(t-1,t-4)}$ includes GDP per capita in PPP constant terms and the number of physicians per 1.000 inhabitants. These variables are averaged over three years, from $t-1$ to $t-4$, and are measured in logarithms. Vector $X_{j,i,t}$ contains quintile- and time-specific female educational attainment expressed in log-linear form.

TABLE 5. Summary Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
Full sample (380 observations)				
Infant mortality[a]	72.13	33.75	11.90	187.70
Child mortality[b]	113.80	67.00	14.20	354.90
Female educational attainment[c]	50.44	31.94	0.50	99.80
Poorest quintile, measured by an asset index (76 observations)				
Infant mortality[a]	86.88	31.32	32.00	187.70
Child mortality[b]	140.08	62.82	39.10	297.90
Female educational attainment[c]	29.15	25.98	0.50	98.70
Second quintile (76 observations)				
Infant mortality[a]	82.62	32.71	23.80	152.30
Child mortality[b]	132.33	69.25	27.30	354.90
Female educational attainment[c]	39.24	29.75	1.00	99.50
Third quintile (76 observations)				
Infant mortality[a]	75.91	34.14	19.70	157.20
Child mortality[b]	120.08	69.44	23.50	348.30
Female educational attainment[c]	48.38	30.98	1.50	99.80
Fourth quintile (76 observations)				
Infant mortality[a]	65.64	32.17	11.90	142.00
Child mortality[b]	102.63	64.63	14.20	314.90
Female educational attainment[c]	59.09	29.71	4.80	99.60
Richest quintile (76 observations)				
Infant mortality[a]	49.58	24.51	13.80	97.20
Child mortality[b]	73.88	45.93	15.80	183.70
Female educational attainment[c]	76.34	20.13	27.00	99.80

Source: World Bank Health, Nutrition, and Population database.

a. Infant mortality is measured by the number of deaths of children under 12 months of age per 1,000 live births, based on experience during the 10 years before the survey.

b. Child mortality refers to the number of deaths of children under age 5 per 1.000 live births, based on experience during the 10 years before the survey.

c. Female educational attainment is measured by the percent of women age 15–49 years who have completed fifth grade.

To test whether the impact of health aid and remittances differs between quintiles, *lnHealthaid* and ln*Remit* are interacted with quintile dummies q_2 to q_5, the poorest quintile being the reference. We choose not to interact quintile dummies with the other control variables such as GDP per capita. in order to limit the number of instruments when the IV specification is used. Finally, we control for quintile fixed effects ($\sum_{j=2}^{5} \tau_j q_j$), as well as for country fixed effects.

As in the cross-country analysis, endogeneity of aid, remittances, and income is controlled for using an IV specification. The education variable has also been found to be endogenous to health indicators. This is probably because education is measured by the contemporaneous school completion rate. Instruments include lagged GDP per capita, the ratio of broad money supply (M2) to GDP, lagged health aid per capita, and total aid budgets for France, Japan, the United Kingdom, and the United States in constant dollars. We also include among the instruments lagged GDP per capita and lagged health aid per capita interacted with quintiles q_2 to q_5.

Estimation Results

The intracountry impact of aid and remittances on child health is assessed using child and infant mortality rates. We proceed in two steps. First, the baseline model is estimated without including any interaction terms between health aid and remittances, on the one hand, and quintile dummies, on the other hand (table 6). We then add these interaction terms to our set of regressors (table 7). Even though controlling for endogeneity and countries' unobserved heterogeneity is likely to provide more reliable results, as in regressions (3) and (6) of table 1, tables 6 and 7 also present the results of simple OLS and fixed-effects regressions.

As suggested by table 6, the impact of our control variables is quite similar to that found using our cross-country specification. GDP per capita, for instance, tends to decrease infant and child mortality rates. The coefficient of this variable suggests that an increase of 1 percent in GDP per capita reduces child and infant mortality by about 0.6 percent. As in the previous specification, the number of physicians per 1,000 inhabitants is found to have no significant effect on child health outcomes. Female education is found to have a negative impact on the child mortality rate but not on the infant mortality rate. This result is in accordance with our previous results but not with those of Ravallion (2007), who found a significant negative impact of female education whatever child health indicators were chosen. This lack of robust impact may come about because the education variable we use is less precise than that employed by Ravallion; we use the percentage of women age 15–49 who have completed the fifth grade, whereas Ravallion (2007) uses the average number of years of female schooling.

Turning to our variables of interest, estimation results suggest that remittances and health aid have no impact at all. Adding interaction terms substantially alters the picture. As suggested by table 7, migrants' remittances are now significant, and their impact on child health outcomes is found to be stronger for the richest quintiles than for the poorest ones. Remittances and remittances interacted with quintile dummies are jointly significant in the child and infant mortality equations. The impact of remittances on health indicators for the poorest quintiles is nil (column 3), whereas it is stronger for the middle and upper classes, at about 0.11, 0.16, and 0.23 for quintiles 3, 4, and 5, respectively. Overall, this result suggests that remittances tend to increase health disparities within countries.

By contrast, neither an antipoor nor a pro-poor effect is detected for health aid. This finding contrasts with that of Fielding, McGillivray, and Torres (2008), who estimate a system of simultaneous equations on several welfare measures, including

TABLE 6. Intracountry Specification without Interaction Terms

	Child mortality rate			Infant mortality rate		
	OLS	Within	2SLS	OLS	Within	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita[a]	−0.272	−0.871	−0.673	−0.281	−0.868	−0.620
	(3.41)***	(5.21)***	(3.16)***	(4.52)***	(5.04)***	(2.71)***
Number of physicians	−0.157	−0.111	−0.016	−0.081	−0.065	0.034
per 1,000 inhabitants	(4.55)***	(1.61)	(0.21)	(2.82)***	(0.92)	(0.39)
Female educational attainment[a]	−0.132	0.047	−0.220	−0.100	0.052	−0.186
	(3.26)***	(2.01)**	(1.79)*	(3.08)***	(2.13)**	(1.59)
Remittances per capita[a]	−0.031	−0.036	−0.075	−0.022	−0.022	−0.076
	(1.64)	(1.30)	(1.53)	(1.34)	(0.77)	(1.56)
Health aid per capita[a]	0.027	0.053	0.048	0.023	0.047	0.045
	(0.71)	(1.72)*	(0.90)	(0.66)	(1.48)	(0.83)
Constant	7.054	11.163		6.696	10.738	
	(11.63)***	(8.84)***		(14.07)***	(8.26)***	
Fixed effects	No	Yes	Yes	No	Yes	Yes
Quintile dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	380	380	370	380	380	370
R^2	0.79	0.72		0.74	0.64	
Number of countries		47	46		47	46
Underidentification test (p-value)			0.01			0.01
Sargan (p-value)			0.52			0.20
Income instrumentation F-statistic (p-value)			0.000			0.000
Female education instrumentation F-statistic (p-value)			0.044			0.044
Aid instrumentation F-statistic (p-value)			0.000			0.000
Remittance instrumentation F-statistic (p-value)			0.000			0.000

Note: 2SLS, two-stage least squares; GDP, gross domestic product; OLS, ordinary least squares. Numbers in parentheses are robust t-statistics. GDP per capita, number of physicians per 1,000 inhabitants, health aid per capita, and remittances are averages over three-year periods, from t − 1 to t − 4, measured in logs. Female educational attainment is measured at the same period as the outcome variable by quintile and is in logs.

a. Instrumented regressors in equations (3) and (6). Instruments include lagged GDP per capita; lagged health aid per capita; ratio of broad money supply (M2) to GDP; and total aid budgets of France, Japan, the United Kingdom, and the United States in constant dollars. Tests for excludability of the instruments are available on request.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

TABLE 7. Intracountry Specification with Interaction Terms

	Child mortality rate			Infant mortality rate		
	OLS (1)	Within (2)	2SLS (3)	OLS (4)	Within (5)	2SLS (6)
GDP per capita[a]	−0.271	−0.867	−0.673	−0.279	−0.865	−0.620
	(3.38)***	(5.63)***	(2.72)***	(4.46)***	(5.33)***	(2.39)**
Number of physicians per 1,000 inhabitants	−0.156	−0.109	−0.016	−0.080	−0.063	0.034
	(4.48)***	(1.72)*	(0.15)	(2.79)***	(0.95)	(0.31)
Female educational attainment[a]	−0.137	0.037	−0.220	−0.103	0.045	−0.186
	(3.53)***	(1.69)*	(1.49)	(3.29)***	(1.92)*	(1.39)
Remittances per capita[a]	0.017	0.015	0.035	0.022	0.024	0.011
	(0.73)	(0.56)	(0.49)	(0.99)	(0.83)	(0.16)
Remittances per capita × quintile 2[a]	−0.033	−0.040	−0.044	−0.034	−0.040	−0.029
	(3.37)***	(2.75)***	(1.00)	(2.80)***	(2.64)***	(0.69)
Remittances per capita × quintile 3[a]	−0.055	−0.063	−0.114	−0.052	−0.059	−0.087
	(3.64)***	(4.35)***	(3.15)***	(3.60)***	(3.84)***	(2.58)***
Remittances per capita × quintile 4[a]	−0.074	−0.077	−0.163	−0.067	−0.070	−0.132
	(4.25)***	(5.31)***	(3.99)***	(3.84)***	(4.55)***	(3.40)***
Remittances per capita × quintile 5[a]	−0.085	−0.076	−0.232	−0.068	−0.060	−0.187
	(3.61)***	(5.21)***	(2.98)***	(3.05)***	(3.93)***	(2.60)***
Health aid per capita[a]	−0.028	0.003	−0.073	−0.031	−0.002	−0.072
	(0.69)	(0.08)	(0.85)	(0.79)	(0.07)	(0.90)
Health aid per capita × quintile 2[a]	0.041	0.040	0.078	0.037	0.037	0.074
	(3.18)***	(1.75)*	(1.32)	(2.24)**	(1.50)	(1.28)
Health aid per capita × quintile 3[a]	0.067	0.062	0.121	0.059	0.055	0.120
	(3.11)***	(2.70)***	(2.20)**	(2.62)**	(2.26)**	(2.29)**
Health aid per capita × quintile 4[a]	0.096	0.087	0.194	0.097	0.089	0.178
	(3.35)***	(3.75)***	(2.94)***	(3.30)***	(3.63)***	(2.76)***
Health aid per capita × quintile 5[a]	0.074	0.061	0.210	0.076	0.066	0.209
	(1.95)*	(2.64)***	(2.17)**	(2.09)**	(2.69)***	(2.30)**
Constant	6.969	11.069		6.620	10.655	
	(11.43)***	(9.51)***		(13.82)***	(8.70)***	
Fixed effects	No	Yes	Yes	No	Yes	Yes
Quintile dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	380	380	370	380	380	370
R^2	0.81	0.76		0.75	0.69	
Number of countries		47	46		47	46
Joint significance of aid variables	0.038	0.000	0.073	0.061	0.005	0.100
Joint significance of remittances variables	0.000	0.000	0.000	0.003	0.000	0.007
Underidentification test (p-value)			0.14			0.14
Sargan (p-value)			0.66			0.31

TABLE 7. (continued)

	Child mortality rate			Infant mortality rate		
	OLS (1)	Within (2)	2SLS (3)	OLS (4)	Within (5)	2SLS (6)
Income instrumentation F-statistic (p-value)			0.000			0.000
Female education instrumentation F-statistic (p-value)			0.000			0.000
Aid instrumentation F-statistic (p-value)			0.000			0.000
Aid × q2 instrumentation F-statistic (p-value)			0.046			0.046
Aid × q3 instrumentation F-statistic (p-value)			0.046			0.046
Aid × q4 instrumentation F-statistic (p-value)			0.046			0.046
Aid × q5 instrumentation F-statistic (p-value)			0.046			0.046
Remittances instrumentation F-statistic (p-value)			0.000			0.000
Remittances × q2 instrumentation F-statistic (p-value)			0.003			0.003
Remittances × q3 instrumentation F-statistic (p-value)			0.003			0.003
Remittances × q4 instrumentation F-statistic (p-value)			0.003			0.003
Remittances × q5 instrumentation F-statistic (p-value)			0.003			0.003

Note: 2SLS, two-stage least squares; GDP, gross domestic product; OLS, ordinary least squares; q, quintile. Numbers in parentheses are robust *t*-statistics. GDP per capita, number of physicians per 1,000 inhabitants, health aid per capita, and remittances are averages over three-year periods, from $t - 1$ to $t - 4$, measured in logs. Female educational attainment is measured at the same period as the outcome variable by quintile and is in logs.

a. Instrumented regressors in equations (3) and (6). Instruments include lagged GDP per capita; lagged health aid per capita; ratio of broad money supply (M2) to GDP; total aid budgets of France, Japan, the United Kingdom, and the United States in constant dollars; and lagged GDP per capita and lagged health aid per capita, both crossed with quintiles q2 to q5. Tests for excludability of the instruments are available on request.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

health outcomes, and find a significant negative impact of total aid (as a percent of GDP) on child mortality and increased effectiveness of aid for the richest quintile.

As a final step, we check whether including medical brain drain among the set of regressors changes the baseline results (table 8). The expatriation rate of physicians does not seem to have a direct significant impact, but its inclusion among the set of regressors mitigates the impact of remittances: whatever the quintile, the impact of remittances on child and infant mortality becomes indeed very low.

TABLE 8. Intracountry Specification with Medical Brain Drain, Two-Stage Least Squares Estimations

	Child mortality rate (1)	Infant mortality rate (2)
GDP per capita[a]	−0.823	−0.814
	(3.41)***	(2.71)***
Number of physicians per 1,000 inhabitants	−0.913	−1.123
	(1.55)	(1.56)
Female educational attainment[a]	0.195	0.348
	(0.65)	(0.95)
Medical brain drain[a]	−0.983	−1.268
	(1.50)	(1.61)
Remittances per capita[a]	0.115	0.114
	(1.52)	(1.18)
Remittances per capita × quintile 2[a]	−0.064	−0.055
	(1.81)*	(1.35)
Remittances per capita × quintile 3[a]	−0.126	−0.102
	(3.85)***	(2.67)***
Remittances per capita × quintile 4[a]	−0.121	−0.077
	(2.78)***	(1.53)
Remittances per capita × quintile 5[a]	−0.077	0.012
	(0.69)	(0.09)
Health aid per capita[a]	−0.116	−0.127
	(1.54)	(1.44)
Health aid per capita × quintile 2[a]	0.053	0.041
	(1.10)	(0.68)
Health aid per capita × quintile 3[a]	0.061	0.043
	(0.98)	(0.56)
Health aid per capita × quintile 4[a]	0.096	0.052
	(1.11)	(0.49)
Health aid per capita × quintile 5[a]	0.068	0.026
	(0.57)	(0.18)
Fixed effects	Yes	Yes
Quintile dummies	Yes	Yes
Number of observations	370	370
Number of countries	46	46
Joint significance of aid variables	0.557	0.804
Joint significance of remittances variables	0.001	0.080
Underidentification test (*p*-value)	0.67	0.67
Sargan (*p*-value)	0.87	0.66
Income instrumentation *F*-statistic (*p*-value)	0.000	0.000
Female education instrumentation *F*-statistic (*p*-value)	0.000	0.000
Aid instrumentation *F*-statistic (*p*-value)	0.000	0.000
Aid × q2 instrumentation *F*-statistic (*p*-value)	0.046	0.046
Aid × q3 instrumentation *F*-statistic (*p*-value)	0.046	0.046
Aid × q4 instrumentation *F*-statistic (*p*-value)	0.046	0.046
Aid × q5 instrumentation *F*-statistic (*p*-value)	0.046	0.046

TABLE 8. (continued)

	Child mortality rate (1)	Infant mortality rate (2)
Remittances instrumentation *F*-statistic (*p*-value)	0.003	0.003
Remittances × q2 instrumentation *F*-statistic (*p*-value)	0.003	0.003
Remittances × q3 instrumentation *F*-statistic (*p*-value)	0.003	0.003
Remittances × q4 instrumentation *F*-statistic (*p*-value)	0.003	0.003
Remittances × q5 instrumentation *F*-statistic (*p*-value)	0.003	0.003
Medical brain drain instrumentation *F*-statistic (*p*-value)	0.000	0.000

Note: GDP, gross domestic product; q, quintile. Numbers in parentheses are robust *t*-statistics. GDP per capita, number of physicians per 1,000 inhabitants, health aid per capita, and remittances are averages over three-year periods, from $t-1$ to $t-4$, measured in logs. Female educational attainment is measured at the same period as the outcome variable by quintile and is in logs.

a. Instrumented regressors. Instruments include lagged GDP per capita; lagged health aid per capita; ratio of broad money supply (M2) to GDP; total aid budgets of France, Japan, the United Kingdom, and the United States in constant dollars; and lagged GDP per capita and lagged health aid per capita, both crossed with quintiles q2 to q5. Tests for excludability of the instruments are available upon request.

* Significant at the 10 percent level.

*** Significant at the 1 percent level.

Conclusion

For several years it has been asserted that the achievement of the Millennium Development Goals by 2015 will require increased external financing coupled with improved targeting effectiveness in favor of the poorest population. In this context, international migrants' remittances have been increasingly put forward as a promising source of external financing. Nevertheless, empirical assessments of the respective impact of aid and remittances on aggregate welfare, measured either by poverty in monetary terms or by human development indicators, are rather scarce.

In this paper we chose to focus on two child health outcomes—under-five mortality (MDG 4) and infant mortality—in order to examine the direct impact of aid to the health sector and of remittances on these human development indicators. Given our primary focus, we do not enter the debate on the relative importance of the direct and indirect (via government pro-poor expenditure) impacts of aid. To complete our diagnosis, we push our analysis further and investigate the net impact of migration—that is, the effectiveness of migration, including the effect of the medical brain drain. We also examine the intracountry allocation of aid and migrants' remittances.

Our results for health aid are in line with the literature that examines the welfare impact of aid using cross-country data in the sense that they suggest a nonrobust relationship between aid and welfare. Although the impact of health aid is found to be significant in our cross-country regressions (but only when aid is interacted with income per capita), this result vanishes when cross-country quintile level data are used.

By contrast, and for the first time, the trade-off between the gains from migration and its costs is underlined. As suggested by our paper, the net impact of migration is rather weak when the negative effect of medical brain drain is taken into account. Moreover, remittances are found to be more beneficial for children belonging to the richest households. This result is in line with other microeconomic evidence suggesting that remittances may increase within-country inequality. It differs from the finding of Chauvet and Mesplé-Somps (2007) that remittances have a pro-poor impact.

The small estimated impact of health aid and remittances net of brain drain costs might well explain why child mortality rates have not substantially improved for three decades, as asserted by Murray et al. (2007), despite the growing volume of health aid and migrants' remittances. This does not imply that official assistance is inefficient, nor does it mean that private remittances should substitute for aid. Rather, it means that further investigation into the microlevel determinants of child mortality rates is needed to improve our understanding of the bad performance on child health outcomes in most developing countries, and in Africa in particular.

ANNEX TABLE A.1 Cross-Country Regression Sample (109 countries)

Albania*	Egypt, Arab Rep.	Madagascar	South Africa
Algeria	El Salvador	Malawi	Sri Lanka
Argentina	Equatorial Guinea*	Malaysia	St. Lucia
Armenia*	Eritrea*	Mali	St. Vincent
Azerbaijan	Ethiopia	Mauritania	Sudan
Bangladesh	Fiji	Mauritius	Swaziland
Belize*	Gabon	Mexico	Syrian Arab Republic*
Benin	Gambia, The	Moldova*	Tajikistan*
Bolivia	Georgia	Mongolia	Tanzania
Bosnia and Herzegovina	Ghana	Morocco	Thailand
Botswana	Grenada*	Mozambique	Togo
Brazil	Guatemala	Namibia	Tonga
Burkina Faso	Guinea	Nepal	Trinidad and Tobago*
Cambodia	Guinea-Bissau	Nicaragua	Tunisia
Cameroon	Guyana	Niger	Turkey
Cape Verde	Haiti	Nigeria	Uganda
Central African Republic*	Honduras	Oman*	Uruguay*
Chad*	India	Pakistan	Vanuatu
Chile*	Indonesia	Panama	Venezuela, R. B. de
China	Iran, Islamic Rep.*	Papua New Guinea	Vietnam*
Colombia	Jamaica	Paraguay	Yemen, Republic
Comoros	Jordan	Peru	Zimbabwe*
Congo, Rep.	Kazakhstan*	Philippines	
Costa Rica	Kenya	Rwanda	
Côte d'Ivoire	Kyrgyz Republic*	Samoa	
Croatia*	Lao PDR	Senegal	
Dominica*	Lebanon	Seychelles	
Dominican Republic	Lesotho	Sierra Leone	
Ecuador	Macedonia, FYR*	Solomon Islands	

... 2SLS estimations.

ANNEX TABLE A.2 Instrumentation Equations

Variable	GDP per capita	Health aid per capita	Remittances per capita
Number of physicians per 1,000 inhabitants	0.027	−0.665	0.510
	(1.050)	(−2.040)**	(1.670)*
Female educational attainment	0.019	0.582	0.204
	(0.310)	(0.780)	(0.260)
Dummy for missing education variable	−0.059	0.886	−1.425
	(−0.560)	(0.660)	(−1.130)
Year = 1995	−0.187	−0.012	−0.923
	(−2.180)**	(−0.010)	(−1.580)
Year = 2000	−0.138	0.487	−1.178
	(−1.630)	(0.600)	(−2.140)**
Twice-lagged health aid per capita	0.004	−0.244	0.074
	(0.860)	(−2.160)**	(1.680)*
Twice-lagged GDP per capita	0.289	−0.170	−0.500
	(3.630)***	(−0.310)	(−1.320)
M2/GDP	−0.054	0.093	0.738
	(−1.050)	(0.230)	(2.170)**
Total French aid budget × same religion	0.175	−0.970	3.606
	(1.030)	(−0.740)	(4.140)***
Total French aid budget × distance	0.000	0.000	0.000
	(−1.080)	(0.940)	(0.750)
Total U.K. aid budget × same religion	−0.294	0.272	−3.825
	(−1.600)	(0.160)	(−3.620)***
Total U.K. aid budget × distance	0.000	0.000	0.000
	(−1.470)	(0.940)	(1.990)**
Total German aid budget × same religion	−0.272	−1.517	−6.228
	(−1.040)	(−0.620)	(−4.090)***
Total U.S. aid budget × same religion	0.151	0.228	1.825
	(1.200)	(0.150)	(2.400)**
Total U.S. aid budget × distance	0.000	0.000	0.000
	(0.620)	(0.620)	(−3.400)***
Total Japanese aid budget × same religion	−0.146	−4.828	6.449
	(−0.590)	(−1.550)	(1.630)
Total Japanese aid budget × distance	0.000	0.000	0.000
	(1.150)	(0.360)	(1.620)
Fixed effects	Yes	Yes	Yes
Number of observations	237	237	237
F-statistic (p-value)	0.0002	0.0997	0.0000
Partial R^2 of excluded instruments	0.3139	0.1760	0.2102

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

ANNEX TABLE A.3 Intracountry Regression Sample

Country name	Year	Country name	Year
Armenia	2000	Kyrgyz Republic	1997
Bangladesh	1996, 1999	Madagascar	1997
Benin	1996, 2001	Malawi	1992
Bolivia	1998, 2003	Mali	1995, 2001
Brazil	1996	Mauritania	2000
Burkina Faso	1993, 1999, 2003	Morocco	1992, 2003
Cambodia	1997	Mozambique	1997, 2003
Cameroon	1991, 1998, 2004	Namibia	1992, 2000
Chad	1996, 2005	Nepal	1996
Colombia	1995, 2000, 2005	Nicaragua	1997
Comoros	1996	Niger	1998
Côte d'Ivoire	1994	Nigeria	1990, 2003
Dominican Republic	1996, 2002	Peru	1996
Ethiopia	2000	Philippines	1998
Gabon	2000	Rwanda	2000
Ghana	1993, 1998, 2003	South Africa	1998
Guatemala	1995, 1998	Tanzania	1996, 1999
Guinea	1999	Togo	1998
Haiti	1994, 2000	Turkey	1993, 1998
India	1992, 1998	Uganda	1995, 2000
Indonesia	1997	Vietnam	1997, 2002
Jordan	1997	Yemen, Republic	1997
Kazakhstan	1995	Zimbabwe	1994, 1999
Kenya	1993, 1998, 2003		

Notes

1. The eight Millennium Development Goals are, in brief: (1) to halve extreme income poverty; (2) to achieve universal primary education; (3) to promote gender equality; (4) to reduce the under-five mortality rate by two-thirds; (5) to reduce the maternal mortality rate by three-quarters; (6) to reduce the incidence of AIDS; (7) to promote sustainable development and to halve the percentage of people without access to safe drinking water; and (8) to set up a global partnership for development involving more generous and more widespread official development assistance.
2. CRS data are available at the OECD Web site http://www.oecd.org/document/0/0,2340,en_2649_34447_37679488_1_1_1_1,00.html.
3. Unlike us, Mishra and Newhouse (2007) include in their sample data on health commitments covering the 1960s and 1970s.
4. Note that the introduction of country fixed effects contributes to solving, although imperfectly, the omitted variable bias.

5. Tavares (2003) and Rajan and Subramanian (2005a, 2005b) use similar instruments for aid and remittances.
6. Tests of overidentification and underidentification are reported in each table. Tests for weak instruments, excludability, and partial R-squared are available on request.
7. Following the literature on the determinants of health, and contrary to Mishra and Newhouse (2007), we do not estimate a system of moment equations using generalized method of moments (GMM) with a lagged dependent variable. The main reason is that the number of time periods is too small.
8. The kind of nonlinearity is still debated. Some authors argue that the relationship is quadratic (Hansen and Tarp 2001; Lensink and White 2001). Others claim that the impact of aid depends on economic policy (Burnside and Dollar 2000), on vulnerability to external shocks (Guillaumont and Chauvet 2001), on export price shocks (Collier and Dehn 2001), or on whether the country is tropical (Dalgaard, Hansen, and Tarp 2004).
9. Results are available from the authors on request.
10. We reran all our regressions using aggregate aid disbursements instead of health aid disbursements, but the variable was never significant, suggesting that not all types of aid affect health outcomes. Results are available on request.
11. The expatriation rate is also provided disaggregated by destination country.
12. Note that our estimations may underestimate the impact because the medical brain drain variable provided by Docquier and Bhargava (2007) measures only emigration of physicians, not that of other medical personnel such as nurses and midwives.
13. In a recent paper, Fay et al. (2007) briefly reply to Ravallion's comments.
14. We are not able to include time dummies because years vary from one country to the other and we only have one year of observation for half the sample.

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Comment on "Are Remittances More Effective Than Aid for Improving Child Health? An Empirical Assessment Using Inter- and Intracountry Data," by Lisa Chauvet, Flore Gubert, and Sandrine Mesplé-Somps

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In their paper, Chauvet, Gubert, and Mesplé-Somps investigate whether health aid or remittances matter for child health and, in particular, whether these help to reduce infant mortality. In this respect, the paper qualifies as one more aid-ineffectiveness study. The deeper issues that the authors address, however, are related to those examined in the paper by Jean-Paul Azam and Ruxanda Berlinschi, in this volume. Chauvet, Gubert, and Mesplé-Somps take note of the call for a progressive substitution of remittances for official aid. If, indeed, remittances from migrant workers prove, in general, more effective than foreign aid in alleviating poverty, the obvious next step is to promote more migration flows from poor to rich countries. The policy advice would be, do not offer aid in lieu of migration; instead, allow more migration in return for less aid—at least, those types of aid for which remittances have been found to be a superior remedy. For this reason alone, and given that the paper by Azam and Berlinschi suggests that rich countries have a hidden agenda of trading more aid for less migration (the opposite tack), this line of inquiry should be enthusiastically welcomed. The excitement of the topic, however, may have also led the authors to attempt too much with a dataset that is arguably dirty. (On the general state of aid data, see Easterly and Pfutze 2008, 30, 51.)

What the Authors Attempt to Do

Looking within and across countries, the authors investigate two key issues and attempt to tackle related interesting questions. The two main issues are (a) whether foreign aid targeted to the health care sector reduces infant (below age 1) and child (under age 5) mortality rates, and (b) whether remittances from migrant workers reduce child and infant mortality rates. Other questions concern the circumstances under which one form of intervention may be more effective than the other. If

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remittances are beneficial, does it matter that they come at the expense of loss of skilled labor from migrant-sending countries? To examine this issue, the authors focus on physician expatriation and its impact. The premise is that if expatriation is harmful, the negative consequences could be set against the perceived benefits of remittances, even though not all the measured remittances accrue from expatriated physicians alone. (The latter observation would, if correct, result in an underestimation of the net effect of brain drain, if such leakages do in fact occur.) The authors also look at the impact of aid and remittances across income deciles within a country and examine the issue of absorptive capacity that has been frequently raised as a serious negative consequence of poor donor aid delivery practices. In rankings of donor best practices, excessive fragmentation and overhead costs are key factors in the rating criteria (Easterly and Pfutze 2008).

What the Authors Find

Using a panel of developing countries, the authors determine that remittances promote child health care but that health aid matters only when the relationships among child health indicators, aid, remittances, and income are taken into account. Of course, this endogeneity effect runs deeper than can be addressed by tinkering with instrumental variables. Here the authors could be picking up the consequences of existing aid practices, perhaps the effect of aid conditionality. It has been argued that the persistence of conditionality is partly attributable to its usefulness as an instrument for the pursuit of donor multiple objectives, of which only a few may be, in fact, altruistic (see Ayogu 2006 for a discussion). Recipient countries understand this larger game. One dimension of the game is the Samaritan's dilemma elaborated in Svensson (2000), according to which a quandary for the do-gooder arises because recipients behave strategically; they have no incentives for implementing poverty reduction strategies when an increasing proportion of aid is conditioned on poverty. Overall, after all the econometric adjustments, the authors find that both types of intervention (foreign aid and remittances from abroad) improve health care outcomes.

Their indirect test of absorptive capacity constraints was not so fruitful, in that it was not supported by the data. Brain drain of doctors was, however, found to be harmful to child health. Medical personnel and health aid are complementary; the lack of one depresses the other. Brain drain therefore reduces the effectiveness of aid as well as the net benefit of remittances. Remittances are found to be more effective than health aid in improving health outcomes for children from richer households. The finding of higher marginal productivity of remittances for higher-income groups may be picking up several issues, such as the fact that remittances are fungible, whereas targeted health aid is not. Remittances have the capacity to improve overall family welfare in a way that targeted health aid is unable to match. Among poor communities, remittances carry a positive feedback and a selection bias. Families that receive remittances are big fish in a small pond—even if their relatives residing overseas are little fish in a humongous pond. Therefore, selectivity bias could be

confounding the interpretation of the finding that the revealed positive impact of remittances on child health discriminates with respect to income. Wealth is good for nutrition and other complementary ingredients for a healthy child, and the income flow from remittances may well add to household wealth over time.

What to Make of the Findings?

Although the authors are careful not to draw any hard recommendations from their study, they have nonetheless made clear that there are no implications here for a migration-aid trade-off. That is a prudent view; the whole question of brain drain, remittances, undocumented workers, and immigration policies in the context of a globalizing world has yet to be addressed adequately. For instance, a recent study (Clemens 2007) finds no evidence of the harmful effects of the external migration of health professionals. The more deleterious effect seems to be internal migration across sectors by professionals anxious to avoid "leaving the brain in the drain." According to the Southern African Migration Project (Crush 2008), working conditions emerge as the single most important predisposing factor for health professional emigration. Particularly influential are (a) the inequitable distribution of personnel across the public versus private and primary versus secondary health sectors, and (b) the urban-rural divide. With regard to the expatriation of physicians, analysts argue that many of the public health issues surrounding infant mortality—such as immunization and hygiene, diarrhea and dehydration, access to clean water, and other basic public health care issues—do not actually make huge demands of a physician's expertise.[1] Physicians do not appear to be as crucial as this study would seem to suggest. Drawing from the experiences of Médecins Sans Frontières (Doctors without Borders) in South Africa, it could be argued that even if the expatriation of physicians is assumed to be less than benign, the core of the primary health care problem lies in governance and in government underinvestment in clinics (Steinberg 2008, 273), rather than in the likely impact of brain drain on child health. Our view on governance is corroborated by a recent finding by Rajkumar and Swaroop (2008).

Finally there are some results that are difficult to reconcile, such as the finding that aid raises infant mortality in some African countries. Clearly, given the HIV/AIDS pandemic, it would have been advisable to control for HIV prevalence (see Deaton 2008). I am equally sympathetic regarding the data problems confronting the authors, including the problematic instrumental variables deployed. Nonetheless, aid practices such as timing of disbursements, conditionality, and the use of bilateral agencies are much more important than cultural distance and should have been used in constructing the proxy for health aid disbursements.

Note

1. I am grateful to Dr. Max Price for this insight.

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The Role of Emigration and Emigrant Networks in Labor Market Decisions of Nonmigrants

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The Indian state of Kerala is an ideal place to explore a question that is prominent in the migration literature: what role does the existence of migrant networks have in the labor market participation decisions of nonmigrant household members? Two linked statewide representative surveys in 1998 and 2003 that collected individual information about each member of 10,000 households, including members who had migrated, are used for this purpose. The analysis of the labor market participation of young men reveals interesting patterns. In cross-sectional data, young men in households with migrant members are found to be less likely to be employed, indicating that migration discourages labor market participation by nonmigrants. When, however, panel data are analyzed and individuals are followed over time, those males under age 30 are found to be more likely to migrate in the second period, taking advantage of their migrant networks. This result goes counter to the claim that migration induces unemployment or withdrawal from the labor market among family members. Rather, it suggests that young men in migrant households have a higher expectation of emigration and that they are less likely to take a job in Kerala while they prepare to emigrate.

Almost 10 percent of the labor force of Kerala State—close to 2 million people—lives and works in a Persian Gulf country. These numbers make Kerala one of the largest migrant-sending regions in the world, and an interesting place to study various aspects of emigration. This paper focuses on a paradox, created by migration, in the employment patterns seen in Kerala. Emigration there increased by around 35 percentage points between 1998 and 2003, and the unemployment rate for young males increased to 17.4 percent. Given the high unemployment rate in the face of massive emigration, the question arises: why has the exit rate of Kerala's labor force not decreased unemployment among nonmigrants in the state? More specifically, what influence does emigration have on the labor supply decisions of nonmigrant household members?

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