Missing in Action:

Teacher and Health Worker Absence in Developing Countries

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In this paper, we report results from surveys in which enumerators made surprise visits to primary schools and health clinics in Bangladesh, Ecuador, India, Indonesia, Peru, and Uganda and recorded whether teachers and health workers were present. Averaging across the countries, about 19 percent of teachers and 35 percent of health workers were absent, as shown in Table 1. In these countries, absent education and health providers are rarely replaced by substitutes, unlike in developed countries. When providers are absent, clients are either not served, or served by fewer providers.

A number of researchers have examined the problem of absence among education and health providers in recent years (Alcázar and Andrade 2001; Banerjee, Deaton, and Duflo 2004; Begum and Sen 1997; Chaudhury and Hammer 2003; Glewwe, Kremer, and Moulin 1999; Habyarimana et al. 2004; King, Orazem, and Paterno 1999; Kingdon and Muzammil 2001; Pratichi Trust 2002; PROBE Team 1999; Sen 1997; World Bank 2003; 2004). This study uses a common methodology – based on *direct physical observation* of provider presence – to collect data on absence based on unannounced visits to nearly nationally representative samples of facilities in six countries. It then explores a wide range of potential determinants of absence at the individual, facility, and state/country levels. Absence is not concentrated among a small number of frequently absent providers, but seems rather to be fairly widespread. Absence rates are generally higher in poorer regions; when school infrastructure is poor; and when a school hasn't been inspected recently. Higher-ranking and more powerful providers, such as headmasters and doctors, are absent more often than lower-ranking ones. The relationship between absence and contractual terms for teachers seems more complicated than often hypothesized.

Background

In most developing countries, including most of those in our survey, the education and health systems are largely centralized. Most teacher hiring and financing decisions in these countries are made by the national government, or, in India, by state governments responsible to scores or even hundreds of millions of people. Teachers and health workers are typically

unionized, and their unions are strong and politically influential. Both teachers and health workers are typically paid a flat salary prescribed by a civil service salary scale. (In contrast, general health care practitioners in developed countries are rarely paid a flat salary. In the United Kingdom, for example, they are typically paid based on the number of patients who sign up for their practice, creating potential competitive pressures.) Teachers in low-income countries earn about seven times GDP per capita, while their counterparts in rich countries earn only about three times per capita GDP (Mingat and Tan, 1998). This may in part be because teachers are more educated relative to the typical member of the labor force in poor countries, but teachers may also receive higher rents in poor countries (where 'rents' are defined as the premium over the market wage). Wages under national civil-service system are typically not fully responsive to local labor market conditions or to individual characteristics, and are often compressed relative to those in the private sector. The long queues of qualified people waiting to be hired as teachers in many developing countries suggest many teachers receive substantial rents. Skilled medical personnel – doctors in particular – likely earn much smaller rents, and it is possible that if they were present in their clinics as frequently as stipulated as their official contracts, they would earn less than their market wage.

Our absence data is based on *direct physical verification* of the provider's presence, rather than attendance logbooks or interviews with the facility head. The survey focused on public primary schools and primary health centers, although in some cases additional facilities were included (for example, in rural India and in Indonesia, enumerators also visited private schools located in the same village as public schools).

In Bangladesh, Ecuador, Indonesia, Peru, and Uganda, enumerators made two visits—typically several months apart—to each of about 10 randomly chosen health care centers and 10 randomly chosen public schools in each of 10 randomly chosen districts, yielding an average of about 3000 total observations on individual providers per country. (The median number of teachers sampled per school ranged from 4 in Bangladesh to 13 in Uganda, while the number of medical workers per health center ranged from 5 in Bangladesh to 13 in Indonesia.) In India, the survey was designed to be representative in each of 20 states, which together account for 98 percent of India's population. Three unannounced visits were made to each of about 3700 schools and 1300 clinics. For each country, a provider was counted as absent if, at the time of a

random facility visit during facility hours, he or she could not be located anywhere in the facility (school or health center).

The enumerators for the survey took several measures to ensure that the rate of absence would not be overestimated. The list of employees used for checking attendance was created at the facility itself, based on staff lists and schedule information provided by the facility director or other principal respondent. Enumerators then checked the attendance only of those who were ordinarily supposed to be on duty at the time of the visit. We omitted from the absence calculations all employees who were reported by the director as being on another shift, whether or not this could be verified. Only full-time employees were included in our analysis, to minimize the risk that shift workers would be counted as absent when they were not supposed to be on duty. These estimates of absence are slightly conservative and adjusting for survey round and time of day effects would increase the estimated teacher absence by 1 – 2 percentage points (Kremer et al., 2004).

We do not think that the absence rate is overstated because of work duties that take employees outside the health facility. At the beginning of the facility interview, the enumerator asked to see the schedule of all medical providers. Only those assigned to work at the clinic on the day of the interview (as opposed, for example, to being assigned to a sub-clinic for that day) were included in the sample. In general, health workers who do outreach or field work are not more absent than others. Also, a recent detailed study in Rajasthan, which found absence rates similar to those we report, made efforts to track down nurses who were absent from health sub-centers and found that only in 12 percent of cases of absence was the nurse in one of the villages served by her subcenter (Banerjee, Deaton, and Duflo 2003).

Absence across Sectors and Countries

Two clear generalizations emerge from the cross-country, cross-sector data on absence and from the variation across Indian states. First, health care providers are much more likely to be absent than teachers. As Table 1 shows, averaging across countries for which we have data on absence for both types of providers, health care workers are 15 percentage points more likely to be absent than are teachers. This difference may arise because health care workers have more

opportunities to moonlight at other jobs, or because health care workers receive smaller rents relative to what they would earn in the private sector, or because health care workers are harder to monitor, since they do not have as concentrated and regular a client base as teachers do.

Second, higher-income areas have lower absence rates. Figure 1 shows the absence-income relationship for the sample countries other than India (represented by triangles and labeled) and for the Indian states in our sample (represented by circles). The left-hand panel shows the relationship among teachers, the right-hand panel among health-care workers. Combining the two sectors across countries and Indian states, an ordinary least squares regression of absence on log of per-capita GDP (measured in purchasing power parity terms) and a dummy for sector (health or education) suggests that doubling of per capita income is associated with 6.0 percentage points lower absence. The coefficient on per capita income is significant at the 1 percent level, and the income and sector variables together account for more than half of the variation in sector-country and sector-state absence rates. When we run two separate regressions, one for the countries and one for the Indian states, we obtain very similar coefficients on log income. In the cross-country regression, doubling income is associated with a 5.8 percentage-point decline in absence; and in the Indian cross-state regression, a 4.8 percentage-point drop.[1]

However, the relationship between a country's per capita income and absence is stronger in education than in health. Among teachers, doubling income is associated with an 8.0 percentage-point absence decline (significant at the 0.1 percent level), compared with only a 3.8 percentage point decline in health-worker absence (falling short of significance at even the 10 percent level).[2] Again a very similar pattern holds in both the cross-country and the Indian cross-state regressions.

In seeking to explain the differences across countries in the level of absence, one set of explanations focuses on the specific institutional qualities in the civil service of each country,

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[1] When we calculate GDP per capita using current market exchange rates rather than the purchasing power parity rates, the results are quite similar. Doubling per-capita income is now associated with a 4.6 percentage-point decline in absence for the overall sample (3.9 across countries, 4.8 across Indian states), and the explanatory power of the regressions remains quite high (adjusted R^2 and p-values on the income coefficient do not change much).

[2] The absence-income relationship in the health sector appears to hold more strongly for doctors than for other medical personnel. Within India, regressing doctor absence on state per-capita income yields a much larger coefficient (in absolute value), significant at the 10 percent level, whereas the coefficient is small and insignificant for health workers as a group.

and how these differences might affect the behavior of civil servants. An alternative set of explanations argues that overall national factors, like the level of per capita GDP, are more important than national differences in institutions. Of course, these explanations may be complementary – that is, both level of development and specific institutions might matter.

The similar statistical relationships between income and absence across countries, which have different institutions, and across Indian states, which have similar formal institutions, raises the possibility that variation in formal institutions - such as civil-service rules and salary scales -- may not drive much of the relationship between absence and income. On the other hand, teacher and health worker absence are correlated across countries and states, even after controlling for per capita income. The residuals from the two regressions depicted in Figure 1 (with an additional dummy added for Indian states) are highly correlated with each other, with a correlation coefficient of 0.44 (significant at the 5 percent level). This result may occur because other non-income factors – such as the quality of governance – have important effects on absence levels in both education and health, or it could be due to difficult-to-measure cultural variables (including peer effects from one sector to another) that could have similar effects in both sectors.

Concentration of Absence

In understanding the phenomena of absence and designing policies to counter it, one key question is whether absences are spread out among providers or concentrated among a small number of "ghost workers" who are on the books but never show up. Table 2 illustrates the results. If most workers are not absent during any visit, it tends to support the ghost worker hypothesis. In thinking about the distribution of absence, it's useful to compare those who are absent once to those who are absent twice. For example, if the propensity to be absent is uniformly distributed in a population of teachers with a mean absence rate of 20 percent, then on any two independent visits, we would expect 4 percent to be absent both times (that is, 0.2 x 0.2 = 0.04), 64 percent to be present both times (0.8 x 0.8 = 0.64), and the remaining 32 percent to be absent once (2 x 0.2 x 0.8 = 0.32). On the other hand, if absence is completely concentrated in

certain providers, we would observe over 2 visits that 20 percent of the teachers are always absent, 80 percent are always present, and none are absent only once.

The general pattern that emerges from the data is that absence appears to be fairly widespread, rather than being concentrated in a minority of "ghost" workers, in the sense that those who are absent twice are usually a much smaller share than those who are absent once. Teachers in Ecuador are an exception and appear to be the leading candidates for a "ghost worker" explanation, with a very high percentage of teachers being present in both visits. When looking at medical workers, with absence rates among medical workers averaging 35 percent, a uniform distribution of absence would imply that about 12 percent of medical workers would be missing on any two occasions (that is, .35 x .35 = .1225) – which is roughly the pattern in three of the four countries. Medical workers in India have higher absenteeism to begin with, and correspondingly higher rates of being absent one, two, or three times.

A more formal approach to analyzing the distribution of absence rates across providers, but based on the limited number of visits by enumerators (a maximum of three visits per facility), this calculation requires some structural assumptions are necessary. Following Glewwe, Ilias, and Kremer (2004), we assume providers' underlying probability of absence follows a beta distribution and estimate this distribution using a maximum likelihood approach. The qualitative results confirm those in the text: that is, other than in Ecuador, absence is typically fairly widespread, rather than being concentrated in a minority of "ghost" workers.

Based on these distribution estimates, we can also estimate a Gini coefficient for the concentration of absences among providers. The Gini coefficient in the penultimate columns measures the concentration of absences among providers: a coefficient of zero would mean that each provider has an identical underlying probability of being absent, while if the same providers are absent in each round of observation, the Gini coefficient would be one minus the absence rate under the estimated beta distribution.[3] In three of the four countries for which we can make the comparison, Ginis for teachers substantially exceed those for health workers. Similarly, the Gini coefficients are higher in countries with lower absence (Peru and Ecuador).

However, higher absence levels imply that the maximum possible Gini will be lower. An alternative measure of concentration is the Gini divided by one minus the absence rate, which is

[3] This will not exactly equal the reported absence rate, though the differences are small.

the highest possible Gini conditional on the absence rate. With this measure, there is no longer a monotonic relationship between absence and concentration of absence in our education data. In three of the four countries for which we can make the comparison, Ginis for teachers substantially exceed those for health workers.

With a maximum of three visits per facility, estimation of the model requires fairly strong structural assumptions. Nonetheless the result that absence is usually broad-based, rather than concentrated among a few ghost workers, is consistent with data from studies where smaller samples of providers were visited more frequently. For example, Glewwe, Ilias, and Kremer (2004) estimate a distribution of teacher absences in two districts of Kenya. They find that although a few teachers are rarely present, the majority of absences appear to be due to those who attend between 50 percent and 80 percent of the time, and the median teacher is absent 14 to 19 percent of the time. Banerjee, Deaton, and Duflo (2004) also find that absences are fairly widely distributed among medical workers.

How Much of the Absence is Authorized?

In countries with high rates of absence, it seems likely that providers are frequently absent without prior authorization. The enumerators asked the facility-survey respondent – generally the school head teacher or primary health care center director – the reason for each absence. The main reasons given were: absent for official duties, like medical outreach, or meetings; absent on authorized leave, like sick leave or other authorized leave; and unexplained absence (which included claims that someone had left early or would be arriving late). These reasons should not necessarily be taken at face value, since facility directors may not always answer truthfully. Nonetheless, the stated reasons provide a plausible basis for evaluating some explanations of absence.

For example, it has been argued that teacher absence is high in south Asia because governments pull teachers out of school to carry out duties such as voter registration and public

health campaigns. But head teachers should have little reason to underreport such absences, [4] and in India, only about 1 percent of observations (4 percent of absences) are attributed to non-education-related official duties (Kremer et al. 2004).

Although illness is a somewhat more frequently stated cause of absence, in no sector/country combination do facility directors attribute more than 15 percent of absence to illness. Two countries of particular interest here are Uganda and Zambia, where HIV infection is prevalent. However, preliminary analysis by Habyarimana (2004) concludes that neither the demographic nor the geographic distribution of teacher absences in Uganda correlates very well with what is known about patterns of HIV prevalence. Moreover, Uganda does not appear to be an outlier with much more absence than would be expected given its income levels; and Zambia, which has much higher HIV prevalence rates than does Uganda, has considerably lower absence than predicted by the absence-income relationship. Therefore, HIV/AIDS does not appear to be a major factor accounting for absence even in Uganda and Zambia.

Many absences are likely unauthorized. Together "unauthorized absences" (including those unacknowledged by facility directors) and "left early/arriving late" typically account for at least 30 percent of stated reasons for absence, and sometimes over 50 percent. Moreover, many absences labeled by the facility directors as "authorized" may in fact be contrary to official policy.[5] Our calculations for the Indian case suggest that the fraction of absences that are claimed to be authorized are higher than one would expect based on the amount of leave providers officially have (Kremer et al., 2004).

Correlates of Teacher Absence

[4] Teacher unions and representatives repeatedly complain about being used for non-teaching tasks by the government, and the respondents should therefore have no reason to understate this reason for absence.

[5] Conversations with school inspectors in India reveal that a common ploy is for teachers to leave generic "leave application" letters with the head teacher, which can be produced to show an "authorized absence" in case an inspector shows up on a day when the teacher is absent. Also, since poor rural communication/transport infrastructure provides a plausible reason for teachers to not be able to communicate "emergencies", it is also possible for teachers to retroactively justify the absence on a day the inspector arrived as being due to sickness. Of course if headmasters collude with teachers, this absence would be deducted from the "sick leave" quota only if the inspector actually arrived on the day of absence.

What factors are correlated with teacher absence? Although our sample includes both low- and middle-income countries on three continents, certain common patterns emerge. Our approach here started by carrying out ordinary least squares regressions for each country. The dependent variable is absence, coded as 100 if the provider was absent on a particular visit and 0 if he or she was present. The explanatory variables are listed in Table 5; we also included district fixed effects in the specification that we report. To obtain estimates of average coefficients for the sample as a whole, we use hierarchical linear model estimation, in which a combined coefficient is estimated by averaging the coefficients of each of the countries, weighted in accordance with the precision with which they are estimated. (By contrast, a pooled ordinary least squares regression with interaction terms for country-specific effects would be swamped by India, since we have 30,825 observations from India and 4055 total observations from the other five countries combined.)[6] At the risk of oversimplifying the heterogeneity across countries, we will focus primarily here on the results for the sample as a whole.

Parental Literacy Rate

Teachers are less frequently absent in schools where the *parental literacy rate* is higher. The coefficient on school-level parental literacy is highly significantly negative for the sample as a whole: as Table 5 shows, each 10-percentage-point increase in the parental literacy rate reduces predicted absence by more than one percentage point. In our regressions for individual countries, summarized in the third column of Table 5, five of the six countries had negative coefficients on this variable and the coefficients were significant in two countries.

However, interpreting causality is not straightforward. More educated parents may be better informed about and more able to influence teacher performance and the quality of schooling. The literacy effect could also reflect greater demand for education by these parents, more pleasant working conditions for teachers (if children of literate parents are better prepared or more motivated), or reverse-causality or selection effects, with educated parents abandoning schools with high absence.

Salaries

[6] In this analysis, standard errors are clustered at the school level. Results using probit are similar.

While we do not have direct information on teacher salaries, we know that teacher's pay structures, salaries are highly correlated with the teacher's *age*, *experience*, educational background like whether the teacher has a *university degree* or a *degree in education*, and rank – like *head teacher* status. Table 5 provides little evidence to suggest that higher salaries, proxied by any of these factors, are significantly associated with lower absence. Head teachers are significantly more likely to be absent, and better-educated and older teachers are on average absent more often. Of course, it is possible that other factors confound the effect of teacher salary in the data; for example, if the outside opportunities for teachers increase faster than their pay within the government pay structure, the regression results presented here could be misleading.

India provides another source of data on the impact of teacher salaries. Since nominal teacher salaries are very similar across Indian states, effective teacher salaries are higher in poorer states, relative to outside opportunities. Yet poorer states in India have the highest absence rates for teachers. The fact that the absence-income relationship across Indian states is similar to that across countries in our sample suggests that any effect of salaries on absence is unlikely to be large.

Monitoring and Discipline

One reason that salaries are not negatively correlated with absence may be that teachers who are absent are extremely unlikely to be fired. For instance, despite India's 25 percent teacher absence rate, only one head-teacher in our sample of nearly 3000 Indian government-run schools reported a case in which a teacher was fired for repeated absence. In such circumstances, the mystery may not be why absence is so high, but why anyone shows up at all!

We examine two measures of the intensity of administrative oversight by Ministry of Education officials: a dummy representing *inspection of the school within the previous two months*; and a dummy representing *proximity to the nearest office of the ministry*, while controlling for other measures of remoteness like whether the *school is near a paved road.* [7] Inspections are often considered to be toothless by education experts and educators. Moreover, if "bad" schools are more likely to get inspected, the coefficient on inspections will be biased

[7] The proximity variables in these regressions—proximity to roads and to ministry offices—are defined slightly differently in each country. Because of the great differences in population density, in some countries a road or office may be counted as "close" if it is within 5 kilometers, whereas in other countries the cutoff is 15 kilometers.

upwards. Having a recent inspection is significantly associated with lower teacher absence in India, but not in the other countries nor for the sample as a whole. However, the coefficient on proximity to the ministry office is more robust. In three of the six countries, schools that are closer to a Ministry of Education office have significantly lower absence, even after controlling for proximity to a paved road; in no country are they more often absent. Of course, proximity to the ministry could proxy for other types of contract with the ministry, or for closeness to other desirable features of district headquarters.

We also attempt to measure the effect of community monitoring, using a dummy that represents whether the Parent Teacher Association (PTA) has met in the previous two months. The coefficient is not significantly negative anywhere, however.

However, the regression results do provide evidence for a different kind of monitoring and discipline story. The coefficients on individual characteristics suggest that more powerful teachers—who are least likely to be monitored and disciplined effectively—are absent more. We already mentioned that head teachers are absent more. In a number of cases, better-educated teachers appear to be absent more: for example, the coefficient on *ever received training* and on *has a degree in education* are both positive in the combined results, although not significant; the coefficient on *has university degree* is positive and significant in India and Uganda (although not positive in the combined results). The coefficient on gender also supports a power hypothesis: point estimates suggest male teachers are more absent in five countries (significant in India), and male teachers are two percentage points more likely to be absent in the global analysis. Finally, the higher teacher absence rate in the first survey round provides support for the idea that monitoring matters. If even the presence of survey enumerators with very little formal powers had a notable impact on absence, it is plausible that formal inspections would also have such an impact.

Working Conditions

Working conditions can affect incentives to attend school, even where receipt of salary is independent of attendance and hence provides no such incentive. The index measuring the quality of the school's *infrastructure* – a sum of the five dummies measuring the availability of a toilet (or teachers' toilet, in India), covered classrooms, non-dirt floors, electricity, and a school library. The analysis for the sample as a whole suggests that moving from a school with the

lowest infrastructure index score to one with the highest (that is, from zero to five) is associated with a 10-percentage-point reduction in absence.[8]

Strong anecdotal evidence suggests that location matters to teachers, with rural and remote areas seen as less desirable. In several countries, rural schools have higher mean absence rates than do urban ones. But after controlling for other characteristics of rural schools, such as poor infrastructure, there is no general positive correlation between remoteness and absence. The dummies for *school is in urban area* and for *school is near a paved road* are both insignificant in all countries in this specification. These variables might have offsetting effects on teacher absence, because being in an urban area or near a road might make the school a more desirable posting, but these factors could also make it easier for providers to leave for at least part of the day and reach other destinations (Chaudhury and Hammer 2003).

Training

A *degree in education* is strongly negatively associated with absence in Bangladesh and Uganda, but the association is positive in Ecuador. *In-service training* is negatively associated with absence in three countries, but not in the global analysis. Moreover, recent training is not associated with reduced absence, other than in Ecuador. The negative coefficient in Ecuador could be due to "ghost teachers" who attend neither schools nor training sessions.

Local Teachers

Teachers who were *born in the district of the school* appear more likely to show up for work, perhaps because they feel a connection to the community. Local teachers are less likely to be absent in all six countries (two of them at statistically significant levels), and the coefficient for the combined sample is also significantly negative.

However, since more developed regions typically have lower teacher absence, and if more developed regions also have a greater supply of qualified teachers, this correlation may be

[8] If frequently absent teachers can be punished by assigning them to schools with poorer facilities, then the interpretation of the coefficient on poor infrastructure becomes unclear. To address this possibility, we also examine Indian teachers on their first posting, because in India, an algorithm typically matches new hires to vacancies. Even in this sample, there is a strong negative relationship between infrastructure quality and absence.

spurious. The use of dummy variables for school district fixed effects could ameliorate this bias, but may not eliminate it. In India, where we are able to include more controls than we can in the multi-country sample, teachers who are from the local community do not have lower absence rates than teachers from outside the community after controls are included. Further caution about claims regarding the importance of local ties is provided by the absence of a significant correlation between the duration of a teacher's posting at the school and teacher presence (except in Uganda). Finally, absence rates in Indian non-formal schools, which are staffed by teachers from the community, are higher than in regular government schools.

Contract Status

Four of the six countries we examine make some use of contract teachers in their primary school systems. It has been hypothesized that these contract teachers, whose tenure in the teaching corps is not guaranteed, may feel a stronger incentive to perform well than do civil-servant teachers. On the other hand, contract teachers often earn much less than civil servants: in India, for example, public-school contract teachers typically earn less than a third of the wages of regular teachers. Moreover, the lack of tenure for contract teachers could increase incentives to divert effort to searching for other jobs. Empirically, we find that contract teachers are much more likely to be absent than other teachers in Indonesia, and that in two other countries and in the combined sample the coefficient is significant in magnitude but is not statistically significant. (Vegas and De Laat 2003) find that in Togo, contract teachers are absent at about the same rate as civil-service teachers.

Opposing forces are also likely at work in determining whether private-school teachers have higher or lower attendance rates than public-school teachers. On the one hand, private-school teachers often earn much lower wages than do public-school teachers; in India, for example, regular teachers in rural government schools typically get paid over three times more than their counterparts in the rural private schools. On the other hand, private-school teachers face a greater chance of dismissal for absence. In India, 35 out of 600 private schools reported a case of the head teacher dismissing a teacher for repeated absence or tardiness, compared to (as noted earlier) one in 3000 in government schools in India.

The absence rate of Indian private-school teachers is only slightly lower than that of public-school teachers. Separate analysis has shown, however, that private-school teachers in

India are 8 percentage points less likely to be absent than public-school teachers working in the same village.[9] Mechanically, this is because private schools are disproportionately located in villages that have government schools with particularly high absence rates. Advocates of private schools may interpret the correlation between the presence of private schools and weakness of public schools as suggesting that private schools spring up in areas where government schools are performing particularly badly; opponents could counter that the entry of private schools leads to exit of politically influential families from the public school system, further weakening pressure on public-school teachers to attend school.

Correlates of Absence among Health Workers

As in education, we began our analysis of correlates of absence among health workers by carrying out ordinary least squares regressions for each country. The dependent variable is absence, coded as 100 if the provider was absent on a particular visit and 0 if he or she was present. The explanatory variables are listed in Table 6; again, we used district fixed effects in the reported specification. We then obtained estimates of average coefficients by averaging the coefficients of each of the countries, weighted in accordance with the precision with which they are estimated (using hierarchical linear modeling).

Doctor Absence

In looking at mean differences in absence rate across health care workers, *doctors* are more often absent in every country, and the higher absence rate among doctors (not adjusted for other factors) is statistically significant in India (4.5 percent higher than non-doctors), Uganda (15.0 percent higher) and Bangladesh (17.5 percent higher). In the regression analysis, even after adjusting for other factors, doctors continue to have higher absence rates than do other medical professionals. In all of the countries in this study, doctors in particular have a

[9] While teachers in private aided schools have lower absence rates than those in private schools in the entire sample, they also have a much higher absence rate (7.5 percentage points more) than private-school teachers in the same village.

marketable skill and lucrative outside earning capabilities (moonlighting is illegal in some countries, but rules against moonlighting are rarely enforced). Doctors often work at private clinics when absent from public clinics. In the sample countries for which we have data on this question (India is excluded), an (unweighted) average of 41 percent of health workers say they have a private practice. By contrast, primary school teachers are unlikely to be working as teachers elsewhere when absent from school; on average, only about 10 percent of our sample teachers report holding any outside teaching or tutoring job.

Monitoring and Discipline

Health providers are less likely to be absent where the *public health clinic was inspected within the past two months* in every country, and the relationship is significant at the 10 percent level in the combined sample. Whether the *public health clinic is close to a Ministry of Health office* is a very strong predictor of lower absence in Indonesia, although the coefficient is not statistically significant in any other country and actually has a reversed sign in the combined sample.

As in education, there is some suggestion that the status of health care providers, and thus their ability to be free from effective monitoring, could also be a factor in absence rates. The strong positive coefficient on the doctor dummy variable could therefore reflect impunity from enforcement of attendance rules, as well as the greater outside earning opportunities discussed above. In more detailed studies of India, we find that for medical providers other than doctors, attendance at larger classes of facilities in India is much higher than in smaller sub-centers where no doctor (and therefore no one of higher status) is assigned. One interpretation is that doctors play a role in monitoring other health care workers.

Working conditions

In the area of infrastructure, the availability of *potable water* predicts lower absence at a statistically significant level in the combined sample as well as in India, Indonesia, and Uganda. However, whether the *public health clinic has toilets* is uncorrelated with absence in any country.

Another aspect of working conditions, the logistics of getting to work and the desirability of the primary health care centers' location, are also correlated with absence in some countries. In Bangladesh and Uganda, providers who *live in primary health care center-provided housing* (which is typically on primary health care centers' premises) have much lower absence, although this coefficient wasn't statistically significant in the global sample. In Indonesia, although not in the global sample, primary health care centers located near paved roads have much lower and statistically significant absence rates.

Providers who *work the night shift* were less likely to be absent for their daytime shifts. Given the usually voluntary and episodic nature of night shifts, this variable may proxy for intrinsic motivation. Alternatively, where night shifts are not voluntary, then perhaps night shifts are assigned to less influential employees, who are less likely to get away with absence.

Efficiency of Absence

It may seem obvious that a situation in which 19 percent of teachers and 35 percent of health workers are absent from their posts on a given day is scandalous. However, it is worth asking two separate questions. First, are teachers and health care workers earning rents beyond what they would obtain outside the public sector? Second, if society has made a decision that public teachers and health care workers will receive rents, then what are the efficiency properties of paying rents in the form of allowing high absence rates?

In the case of education, as discussed earlier, many primary school teachers in developing countries earn rents. In India, for example, public-school teachers earn much more than their counterparts either in the private sector or among contract teachers hired by the public sector, and qualified applicants form long queues to be hired as government teachers. The correlation between inspection intensity and teacher attendance in some countries suggests that teachers may be willing to improve attendance when they are monitored – which suggests that teachers do not wish to lose rents they are earning.

However, even if these countries wish to pay rents to teachers, paying such rents in the form of allowing teachers to be absent at random times makes little sense. At an intuitive level, it is efficient for students to show up when teachers show up. If teachers have a high value of time

on the first Monday of the month when they go into town to cash their paychecks, both students and teachers should be absent then. Efficient allocation of teachers and student time implies that teacher and student attendance should be perfectly correlated. (Of course, coordination of absence is a necessary but not sufficient condition for efficiency.)

It is hypothetically possible that students know when providers are available, or how to find them, even if researchers cannot discern a pattern. However, we are not able to discern a pattern in the data. As one rough test, we looked at data for India and estimated the regression $C^* = B_0 + B_1 P^*$ with fixed effects for each facility, where C^* is the fraction of client (student) attendance and P^* is the fraction of providers (teachers) present. Efficiency implies that $B_1 = 1$. When we test this prediction using school data from India, we find that $B_1 = 0.35$ and we can strongly reject the hypothesis that $B_1 = 1$. [10]

It is harder to prove that health care providers are obtaining rents. There are no queues of unemployed doctors in these countries. It seems possible that if doctors' wages were kept constant, but they were prohibited from being absent, many would quit and enter private practice or even migrate to richer countries. Chomitz et al. (1999) find that many Indonesian doctors will require enormous pay premiums to be willing to accept postings to islands off Java.

One interpretation of high absence rates among skilled health workers is that the government is paying providers to locate in an undesirable rural area and to spend part of their day serving poor patients at public facilities. In exchange, the implicit contract between the government and providers allows providers to work privately during the rest of the day. Our finding that medical personnel who ask to be posted in a particular place are absent less often could be interpreted as consistent with the view that absence rates can be seen as a compensating differential.

However, it seems unlikely that the most efficient way to implement a contract that allowed doctors to work part time for the government would be through a system in which

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[10] Even if different areas have different values of provider time, client time, and output (so different areas have different optimal absence rates), and even if providers have different costs of time at different periods (so absence rates may vary across time within a location), efficiency has testable implications. Efficiency within a particular facility implies optimal intertemporal allocation of provider and client time. If the cost of client time does not vary across periods, the marginal product of client time should be a constant, which implies that the ratio of clients to providers within a facility should be constant over time assuming client and provider time are complements. This argument assumes an interior solution with not all potential students attending each day. This condition is likely satisfied. A formal demonstration of this is available from the authors.

providers were formally required to be present full time but these regulations were not enforced. In their intensive study of medical providers in rural Rajasthan, Banerjee, Deaton, and Duflo (2003) find that "public facilities are thus open infrequently and unpredictably, leaving people to guess whether it is worth their while walking for over half an hour to. . . the closest public health facility." Patients with acute health care problems that require immediate attention cannot easily substitute for a missing doctor. It is also not completely clear what public policy goals are served by subsidizing many types of curative care in rural areas to such an extent. In the typical clinic in Peru, for example, the ratio of patients seen to provider hours was about 2.0**.** This ratio seems fairly low, with healthcare being very expensive to provide in these areas.

Political Economy of Absence

One important proximate cause of high teacher absence may be weak supervision, in which case a number of remedies suggest themselves. Headmasters could be required to keep good records and could be demoted if inspectors find their records are inaccurate. Such rules are typically on the books but are not enforced. More inspectors could be hired.[11] Duflo and Hanna (2005) suggest that technical means for verifying absence exist, like cameras.

Why doesn't the political system generate demands for stronger supervision of providers? Most of the countries in our sample are either democratic or combine elements of democracy and authoritarianism. Yet provider absence in health and education is not a major election issue. Apparently, politicians do not consider campaigning on a platform of cracking down on absent providers to be a winning electoral strategy.

One possible reason why provider absence is not on the political agenda is that providers are an organized interest group, whereas clients, particularly in health, are diffuse. Middle class teachers and health workers have more political power than those poor enough to use public schools and public clinics. In many countries, even those who are moderately well off send their children to private schools and use private clinics. This pattern may create a self-reinforcing

[11] In some of the countries we examine, provider absence was reportedly less of an issue during the colonial period, and absence has reportedly also been low in some authoritarian countries, such as Cuba under Castro or Korea under Park. Both sets of claims would be difficult to verify, however.

cycle of low quality, exit from the public sector, and further deterioration of quality (Hirschman, 1970).

Another possible reason is that the centralization of education and health systems in most developing countries contributes to weak provider accountability. Voters in a particular electoral constituency selecting a member of parliament may rationally prefer that their representatives use their political influence to obtain a greater share of education funds for their constituency -- for example, by building new schools there -- rather than to improve the overall quality of the system. The free-rider problem among politicians would be ameliorated if policy were set in smaller administrative units.

But smaller administrative units would face tradeoffs, too. In the civil service system in place in the countries we examine, providers have weak incentives, but the opportunity for corruption by politicians is somewhat limited. If oversight was provided by local elected bodies, teachers would have stronger incentives, but local politicians would also have greater opportunity to appoint friends, cronies, or members of favored ethnic or religious groups.

Once the decision has been made that teachers will be paid on a common civil service basis, it may be difficult for most developing countries to avoid a situation in which many teachers are earning substantial rents. Assume that people have a single dimension of ability and sort into professions according to their ability. The distribution of wages in the private sector tends to be skewed in most countries, so that, for example, the gap between wages at the 75^{th} and 85^{th} percentile of the ability distribution is much smaller than that between wages at the 87^{th} and at the 97^{th} percentile. Suppose 10 percent of the labor force is on a compressed civil-service pay scale and that the wage is set equal to the private-sector benchmark for those at the upper end of this 10 percent. Then workers below this ability will earn rents in the civil service. However, civil servants in developing countries are further up the ability distribution than in developed countries and the skewness of the wage distribution in the private sector implies that the typical teacher will earn much greater rents in a poor country. Moreover, heterogeneity in local labor market conditions and in the compensating differentials needed to attract skilled personnel to different regions will typically be greater in developing countries than in developed countries.

Once a system is in place in which many teachers earn above-market wages, there will be a tendency to install systems that protect these rents with pressures for strong civil service protection. In the absence of such civil service protection, those with the right to hire and fire

teachers will be able to extract rents from those teachers who would otherwise receive them. It's therefore understandable that teachers' unions will favor procedures that make it difficult for inspectors, headmasters, or school committees to get teachers fired. Even if high absence is an inefficient way for society to transfer rents to teachers, teachers may be constrained to take some of their rents in the form of high absence rates to protect these rents**.** Technical approaches allowing objective monitoring of teacher attendance such as the camera monitoring system explored by Duflo and Hanna (2005) may hold promise for allowing more efficient bargaining between teachers and society, if they can allay fears that teachers who are not frequently absent may still be unfairly subject to sanction.

Conclusion

With one in five government primary-school teachers and more than a third of health workers absent from their facilities, developing countries are wasting considerable resources and missing opportunities to educate their children and improve the health of their populations. Even these figures may understate the problem, since many providers who were present in their facilities may not be delivering services. Our results complement a large recent literature that argues that corruption and weak institutions in developing countries reduce private investment and thus growth. Poorly functioning government institutions may also impair provision of education and health. This could substantially reduce long-run growth as well as short-run welfare, since public human capital investment accounts for a large fraction of total investment in many countries.

Faced with high absence rates, policymakers have two challenges. First, how can education and health policy be adapted to minimize the cost of absence? Second, how can absence be reduced?

Policies in education and health should be designed to take into account high absence rates. For instance, doctor absence may be difficult to prevent, but possible to work around. Very high salaries may be required to induce well-trained medical personnel -- doctors in particular -- to live in rural areas where they will find few other educated people and where educational opportunities for their children will be limited. To conserve on permanently posted

rural workers who exhibit such high absence rates, health policy might shift budgets towards activities that do not require doctors to be posted to remote areas. This could include immunization campaigns, vector (pest) control to limit infectious disease, health education, providing safe water, and providing periodic doctor visits rather than continuous service, (Filmer, Hammer, and Pritchett 2000; 2002). Doctors could be used in hospitals, where medical personnel are likely to attend work more regularly (World Bank 2004), and efforts could be made to reduce the cost of getting patients to towns and hospitals.

Our results can provide only tentative guidance as to how absence rates could be reduced. In Ecuador, for example, identifying and eliminating ghost teachers could go a long way. More generally, our analysis does suggest a range of possible interventions that might be worth testing. Some, such as upgrading facility infrastructure and constructing housing for doctors, would involve extra budget outlays, but would not require politically difficult fundamental changes in systems. Others, such as increasing the frequency and bite of inspections, could be implemented using existing rules already on the books. More politically controversial would be reforms that gave local institutions like school committees new powers to hire and fire teachers or allowed clients to choose providers and that paid providers based on these choices. In the accompanying article in this journal, Banerjee and Duflo review evidence from a number of randomized evaluations of incentive programs linked to provider teacher attendance and to student performance. In interpreting the results of such studies and programs, it is worth bearing in mind that norms of acceptable absence may be influenced by providers' behaviour, perhaps with some lag (Basu 2004). Thus, fairly small changes in incentives for providers could create a multiplier effect, leading to large long-run changes in absence.

Finally, another potentially productive step would be for Ministries of Education and Health, or independent civil society groups, to monitor provider absence regularly. Such data may be useful in assessing the impact of alternative policies. In addition, publicizing data on absence could lead to pressure for reform.

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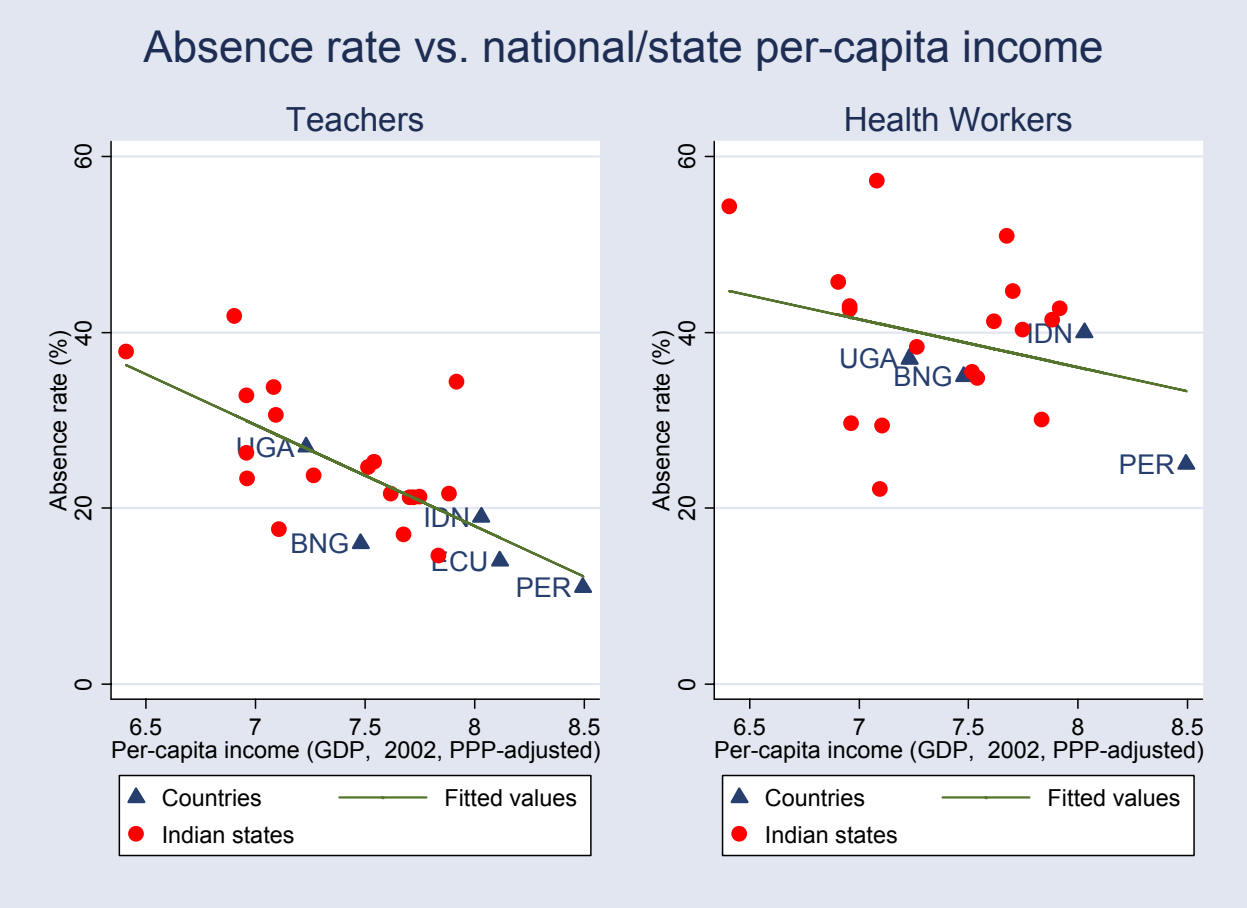
Figure 1



Source: Authors' calculations

Note: BNG=Bangladesh; ECU=Ecuador; IDN=Indonesia; PER=Peru; UGA=Uganda. India's national averages are excluded, due to the inclusion of the Indian states.

1

2

Table 1
Provider Absence Rates by Country and Sector

	Absence rates (%) in:	
	Primary schools	**Primary health centers**
From this project:		
Bangladesh	16	35
Ecuador	14	--
India	25	40
Indonesia	19	40
Peru	11	25
Uganda	27	37
Unweighted average	**19**	**35**

Notes: (1) Providers were counted as absent if they could not be found in the facility for any reason at the time of a random unannounced spot check (see text for further detail).
(2) In Uganda, the sampled districts were divided into sub-counties, and schools in sub-counties with level III health centers comprise the school sampling frame. This sampling strategy may have had the effect of understating slightly the national absence rate there, given that schools in more rural areas appear to have higher absence rates. *(We intend to adjust for this in later versions of the paper.)*

Table 2
Distribution of absences among providers

	Empirical distribution				Estimated underlying distribution							
	Percentage of providers who were absent this many times in 2 visits (3 visits in India)				Providers with underlying probability of absence in this range:							
					Pr(absence)<20%		20%<=Pr(absence)<50%		Pr(absence)>=50%		Absence Gini	Absence Gini (adjusted)
	0	1	2	3	Percentage of providers	Percentage of absences	Percentage of providers	Percentage of absences	Percentage of providers	Percentage of absences		
Teachers												
Bangladesh	73.4	23.5	3.2	--	63.1	41.4	36.4	57.1	0.5	1.5	0.31	0.37
Ecuador	82.8	6.9	10.4	--	80.6	9.7	5.1	11.0	14.3	79.4	0.78	0.92
India	49.1	32.7	13.5	4.8	48.4	18.9	40.5	53.1	11.2	28.0	0.41	0.55
Indonesia	67.7	27.5	4.8	--	61.5	22.4	28.9	46.8	9.6	30.8	0.52	0.64
Peru	81.0	17.3	1.7	--	80.3	38.0	16.8	46.2	2.9	15.8	0.60	0.68
Uganda	63.0	29.6	7.4	--	55.6	13.1	24.4	31.4	20.1	55.5	0.56	0.75
Unweighted average					**64.9**	**23.9**	**25.3**	**40.9**	**9.8**	**35.2**	**0.53**	**0.65**
Medical workers												
India	35.7	31.9	20.8	11.6	33.8	6.5	27.8	23.0	38.4	70.5	0.43	0.73
Indonesia	46.1	41.0	12.9	--	30.5	7.7	36.8	32.8	32.7	59.5	0.39	0.62
Peru	56.4	33.5	10.1	--	52.4	14.4	29.1	37.0	18.5	48.6	0.51	0.69
Uganda	52.0	38.0	10.0	--	41.1	9.0	29.2	28.4	29.8	62.5	0.47	0.71
Unweighted average					**39.5**	**9.4**	**30.7**	**30.3**	**29.8**	**60.3**	**0.45**	**0.69**

Notes:
(1) The "empirical distribution" columns give gives the distribution of absences observed for each type of provider in each country. For example, it shows that during 2 survey visits, 73.4% of teachers in Bangladesh primary schools were never absent; 23.5% were absent once; and 3.2% were absent during both visits. Bangladesh PHC workers are excluded, because the first-round survey was carried out for a different study, making it impossible to match workers across rounds and show the empirical distribution.
(2) The "estimated underlying distribution" columns show the underlying distribution of absence estimated using a beta-binomial procedure, as described in the text.

Table 3
Stated reasons for absence
(% of providers)

	Health workers						Teachers						
	Uganda	**Bangla.**	**India**	**Indon.**	**Peru**	**Average (unweighted)**	**Uganda**	**Bangla.**	**India**	**Indon.**	**Ecuador**	**Peru**	**Average (unweighted)**
Official duties	**9.6**	**11.4**	**21.0**	**16.9**	**10.3**	**13.7**	**5.7**	**8.6**	**8.4**	**3.6**	**3.4**	**1.4**	**5.1**
Medical outreach	4.0	1.3	15.0	12.1	3.1	6.7	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Other official duties	5.6	10.2	5.9	4.8	7.1	7.1	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Authorized leave	**15.0**	**12.1**	**11.0**	**9.9**	**7.4**	**11.1**	**9.1**	**6.8**	**8.4**	**7.0**	**3.2**	**2.6**	**6.0**
Sick leave	2.0	0.0	1.2	2.6	1.1	1.4	3.9	1.5	1.5	2.5	1.8	1.0	2.0
Other authorized leave	13.0	12.1	9.8	7.3	6.3	9.7	5.2	5.2	6.8	4.5	1.4	1.5	3.9
Unexplained absence	**11.5**	**11.5**	**6.9**	**13.2**	**5.7**	**9.7**	**11.1**	**0.6**	**8.1**	**7.8**	**7.2**	**5.9**	**6.9**
Unexplained	3.1	10.9	3.0	8.1	4.9	6.1	5.9	0.2	6.8	5.4	5.9	5.7	5.4
Left early/arriving late	8.4	0.6	3.9	5.1	0.8	3.5	5.2	0.4	1.2	2.4	1.3	0.3	1.6
Other reasons	**1.0**	**0.0**	**1.2**	**0.0**	**1.7**	**0.9**	**1.1**	**0.0**	**0.3**	**0.7**	**0.2**	**1.1**	**0.6**
Total absent	***37***	***35***	***40***	***40***	***25***	***35***	***27***	***16***	***25***	***19***	***14***	***11***	***19***

Note: Table gives the share of providers (among those who are ordinarily supposed to be present at time of visit) for which each of the listed reasons for absence was given by the facility director or other respondent. "Unexplained" absence includes (i) absences reported by the facility director (or other respondent) as being unauthorized; and (ii) absences that were not acknowledged by that respondent (and hence were not explained).

Table 4

Teachers: Mean differences in absence rate by selected characteristics

	Bangladesh	Ecuador	India	Indonesia	Peru	Uganda
Male	-0.6	0.3	5.2***	3.8**	4.0**	1.4
Received training	3.1	9.0	-12.6***	-5.6**	-0.7	-13.7***
Union member	-0.6	3.6*	-5.6***	-0.3	-1.5	-2.4
Born locally	-0.3	-5.4***	-4.2***	-2.7*	2.5	4.5**
Received recent training	0.9	-5.4**	-3.0***	1.5	1.9	-9.1***
Longer-term employee	-0.3	-1.3	-3.7***	-0.6	0.0	-5.6***
Older than median	-0.1	1.6	6.1***	3.5**	-1.1	8.6***
Married	-9.5*	-0.9	-12.0***	-1.0	-0.8	8.0***
Contract teacher	-	6.0**	-0.5	6.3***	6.9***	-
Has bachelor's diploma	9.2***	-3.2	-0.1	-0.1	-3.6*	19.3***
Has degree in education	-8.9***	-0.0	-13.4***	-6.0	-7.3***	-7.4***
Head teacher	2.6	-1.7	7.1***	9.4***	12.4***	21.3***
School inspected recently	-3.9	-5.3***	-4.5***	3.7**	-2.7*	-5.8***
School is near Ministry of Education office	-4.9*	-4.4**	-1.3**	-11.0***	-0.7	7.4***
School had recent PTA meeting	-0.1	8.1***	-4.8***	-1.2	2.2	-3.1
Students' parents have high literacy rate	-3.3	8.0***	-4.8***	6.3	2.1	-1.7
School has good infrastructure	1.9	-2.4	-8.2***	-2.0	-5.7***	3.2
School is near paved road	-0.5	7.2**	-6.9***	-0.5	-11.1***	-1.0
School has high pupil-teacher ratio	-5.6**	-7.4***	-0.7	-1.4	-0.9	2.8
School is in urban area	2.9	1.9	-2.3***	-3.0*	-6.1***	-3.2
School is large	-5.7**	-1.6	-3.2***	-3.9**	-2.5*	0.5
School has teacher recognition program	1.1	5.7***	-3.6***	-0.7	3.0*	-4.6**

* Significant at 10%, ** significant at 5%, *** significant at 1%

Table gives the difference in mean absence rates between the indicated category and its complement. For example, it shows that male teachers in India have an absence rate that is 5.2 percentage points higher than that of female teachers, and that the difference is significant at the 1 percent level.

Table 5

Correlates of Teacher Absence (OLS and HLM, District-Level Fixed Effects)

(Dependent Variable = Visit Level Absence of a Given Teacher: 0 = Present, 100 = Absent)

	Country-specific regressions						Global HLM
	[1] **Bangladesh**	[2] **Ecuador**	[3] **India**	[4] **Indonesia**	[5] **Peru**	[6] **Uganda**	[7] **All countries**
Male	3.518	0.669	2.327***	2.174	2.037	-2.356	1.942**
	[3.030]	[2.696]	[0.580]	[1.775]	[2.103]	[2.005]	[0.509]
Ever received training	2.929	23.859***	-2.661***	-6.176*	1.532	-5.565*	2.141
	[3.086]	[7.575]	[0.963]	[3.211]	[11.133]	[3.113]	[4.354]
Union member	-0.097	6.112**	0.405	4.174	0.395	-1.631	2.538*
	[2.704]	[2.617]	[0.731]	[2.978]	[2.246]	[2.529]	[1.258]
Born in district of school	-2.61	-4.722	-1.713***	-3.117*	-0.031	-0.2	-2.715**
	[3.829]	[2.969]	[0.607]	[1.746]	[2.559]	[2.343]	[0.833]
Received recent training	-2.017	-7.979***	0.402	2.42	2.262	-2.045	-0.74
	[3.173]	[2.924]	[0.713]	[1.870]	[2.472]	[2.695]	[2.070]
Tenure at school (years)	0.029	-0.116	-0.02	0.106	0.263	-0.721**	0.033
	[0.178]	[0.186]	[0.041]	[0.133]	[0.187]	[0.291]	[0.044]
Age (years)	-0.173	0.206	0.038	-0.04	-0.165	0.317*	0.021
	[0.207]	[0.145]	[0.034]	[0.155]	[0.153]	[0.177]	[0.046]
Married	4.615	-0.309	-0.651	0.928	1.165	4.904**	0.742
	[5.877]	[2.445]	[0.835]	[3.207]	[1.698]	[2.237]	[0.972]
Contract teacher		5.509	-0.687	8.250**	3.432		5.722
		[4.426]	[1.407]	[3.556]	[3.343]		[2.906]
Has university degree	4.271	-3.675	1.503**	-0.73	1.048	11.773*	-1.055
	[2.953]	[2.407]	[0.589]	[2.530]	[3.331]	[6.572]	[1.162]
Has degree in education	-28.601***	7.492**	1.758*	-4.277	-6.831	-16.266***	1.806
	[5.836]	[3.802]	[1.014]	[5.438]	[4.682]	[4.239]	[2.071]
Head teacher	3.326	0.724	4.482***	7.326**	6.205	5.849	3.771***
	[3.515]	[5.606]	[0.719]	[3.691]	[8.921]	[4.756]	[0.888]
School inspected in last 2 mos.	-2.227	-0.522	-2.435***	1.867	0.657	-3.86	-0.142
	[2.218]	[5.316]	[0.685]	[2.307]	[2.356]	[3.121]	[1.194]
School is near Min. Education office	-2.963	-11.105***	-1.535**	-5.454*	0.12	1.071	-4.944
	[2.554]	[4.217]	[0.773]	[3.199]	[3.066]	[3.569]	[2.642]
School had recent PTA meeting	1.248	4.261	-0.962	-1.816	4.880*	-1.092	2.308
	[2.486]	[4.515]	[0.707]	[2.479]	[2.518]	[3.038]	[1.576]
Students' parents' literacy rate (%)	-1.248	-10.313	-5.132***	-22.634	-24.295**	6.883	-9.361***
	[4.659]	[13.446]	[1.663]	[16.143]	[11.303]	[10.810]	[1.604]
School infrastructure index (0-5)	-2.126	-4.648*	-1.352***	-1.04	-1.991	3.197	-2.234***
	[2.090]	[2.682]	[0.382]	[1.817]	[1.751]	[2.771]	[0.438]
School is near paved road	1.338	4.116	-0.784	3.083	-3.317	1.264	0.040
	[3.760]	[6.353]	[0.964]	[4.103]	[8.523]	[4.103]	[1.106]
School's pupil-teacher ratio	-0.063	-0.440*	-0.014	0.153	-0.008	0.145	-0.095
	[0.046]	[0.255]	[0.017]	[0.112]	[0.126]	[0.097]	[0.080]
School is in urban area	-1.285	2.769	0.341	-1.436	1.189	-5.103	2.039
	[2.014]	[5.516]	[0.837]	[3.131]	[6.171]	[3.577]	[1.441]
School's number of teachers	-0.215	0.267	-0.046	-0.282	0.192	0.112	0.015
	[0.652]	[0.443]	[0.144]	[0.349]	[0.130]	[0.317]	[0.113]
School has teacher recognition program	-4.062	7.029	-1.098	-7.524***	5.25	-3.462	0.168
	[7.848]	[4.724]	[0.827]	[2.866]	[3.574]	[3.597]	[3.525]
Dummy for 1st survey round	0.416	7.543***	2.709***	-1.794	4.356*	3.037	2.938
	[2.512]	[2.790]	[0.839]	[2.125]	[2.264]	[4.460]	[1.874]
Constant	59.096***	1.996	31.215***	47.941**	33.524**	3.037	32.959***
	[15.449]	[25.291]	[2.763]	[20.410]	[14.712]	[11.096]	[1.963]
Observations	771	1163	30825	2137	1172	1624	34880
R-squared	0.09	0.21	0.06	0.06	0.11	0.14	

* significant at 10%; ** significant at 5%; *** significant at 1%

Robust standard errors clustered at the school level are given in brackets for OLS regressions in columns 1-6.

Regressions also included dummies for the days of the week.

Table 6
Absence Rate by Type of School and Teacher in India

	Type of school			Type of teacher (public schools only)			
	Public schools	**Private aided**	**Private schools**	**Head**	**Deputy head**	**Permanent /regular**	**Contract/ informal**
Teacher absence rate	24.8%	20.1%	22.8%	30.2%	22.2%	23.1%	24.0%
Number of observations	34918	3371	9098	7117	1979	23333	2037

Table 7

Health workers: Mean differences in absence rate by selected characteristics

	India	Indonesia	Bangladesh	Peru	Uganda
Male	-2.0***	4.1*	2.6	7.8***	6.7***
Longer-term employee	10.9***	-1.9	-11.4**	-1.5	-3.8
Born locally	-15.8***	-5.3**	-13.1***	9.4**	8.7***
Contract employee				-5.5**	
Employee is doctor	4.5***	2.3	17.5***	0.8	15.0***
Employee works at night shift	-6.1***	-20.1***	0.6	3.7	-9.2***
Employee provides outreach services	9.1***	4.8	-1.4	1.1	-6.8***
Employee resides in PHC housing	3.1***	-7.2**	-4.9	6.9	-8.9***
Facility inspected recently	-2.2***	-10.6***	-3.3	2.5	1.4
Facility is near Ministry of Health office	0.2	-5.6***	5.0	-8.2***	-0.2
Facility has toilet	0.1		5.5	5.3	
Facility has water	-3.8***	0.2	1.2	-14.3***	12.4***
Facility is near paved road	-2.5***	-28.6**	15.0*	-9.7***	0.5
Facility in urban area				-4.4*	
CHC (Larger facilities in urban/semi-urban areas)	-5.1***				

* Significant at 10%, ** significant at 5%, *** significant at 1%

Table gives the difference in mean absence rates between the indicated category and its complement. For example, it shows that male health workers in India have an absence rate that is percentage points lower than that of female teachers, and that the dif

Table 8
Correlates of Medical Provider Absence (OLS and HLM, District-Level Fixed Effects)

(Dependent Variable = Visit-Level Absence of a Given HC Staff Member: 0 = Present, 100 = Absent)

	Country-specific regressions					Global HLM
	[1] **Bangladesh**	[2] **India**	[3] **Indonesia**	[4] **Peru**	[5] **Uganda**	[6] ***(ex Bangl)***
Male	3.404	-2.624	2.11	0.934	1.121	-0.526
	[6.541]	[0.662]***	[2.119]	[2.929]	[2.958]	[1.546]
Tenure at facility (years)	-1.467	-0.469	0.682	1.05	-0.706	0.042
	[1.473]	[0.126]***	[0.501]	[0.863]	[0.608]	[0.357]
Tenure at facility squared	0.046	0.009	-0.029	-0.08	0.001	-0.005
	[0.073]	[0.005]*	[0.023]	[0.059]	[0.024]	[0.009]
Born in PHC's district	-13.479	0.237	-2.328	2.959	8.263	-1.394
	[4.609]***	[0.649]	[2.114]	[4.295]	[3.055]***	[0.863]
Contract employee				-7.058		
				[2.649]***		
Doctor	15.499	3.226	3.512	0.325	15.551	3.420
	[6.714]**	[0.854]***	[2.481]	[3.113]	[4.662]***	[0.758]**
Works night shift	-4.89	-4.921	-1.717	-4.013	-4.851	-3.840
	[5.829]	[0.672]***	[3.278]	[3.076]	[3.352]	[1.333]*
Conducts outreach	-1.286	6.297	4.874	1.422	-7.677	6.677
	[5.525]	[0.671]***	[2.995]	[4.027]	[3.246]**	[0.614]***
Lives in PHC-provided housing	-10.223	0.912	-2.334	-5.027	-5.64	-0.541
	[5.162]**	[1.063]	[2.638]	[5.298]	[3.400]*	[1.488]
PHC was inspected in last 2 mos.	-5.989	-0.356	-4.114	-1.357	-3.149	-1.951
	[5.545]	[0.676]	[2.895]	[2.802]	[2.815]	[0.618]*
PHC is close to MOH office	4.641	2.598	-5.054	-4.311	-0.945	0.868
	[5.261]	[1.550]*	[2.132]**	[3.191]	[4.604]	[1.959]
PHC has toilet	4.163	-0.863		11.162		
	[11.713]	[0.777]		[13.534]		
PHC has potable water	-10.283	-2.69	-8.106	1.871	8.233	-3.319
	[9.450]	[0.840]***	[4.815]*	[5.598]	[4.486]*	[0.846]*
PHC is close to paved road	8.865	-0.874	-32.652	-4.811	0.599	-5.782
	[9.386]	[0.775]	[11.357]***	[4.185]	[4.480]	[2.866]
Dummy for 1st survey round		4.697	-27.659	-8.664	-5.574	-12.390
		[0.674]***	[1.596]***	[4.903]*	[2.761]**	[11.197]
Dummy for 2nd survey round		3.648				
		[0.735]***				
Constant	25.866	36.723	74.061	44.076	51.087	37.317
	[16.876]	[2.074]***	[12.927]***	[17.566]**	[11.649]***	[1.408]***
Observations	339	26127	1767	1123	1264	27894
R-squared	0.12					
Number of providers	339	9493	1094	607	747	12280

* significant at 10%; ** significant at 5%; *** significant at 1%

Robust standard errors in brackets

Bangladesh regression uses only one round of data, and is therefore a simple cross-section.

Where applicable, regressions also include dummies for urban area (Peru) and for type of clinic (Bangladesh, India).