

## CHAPTER 6

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### TEACHER ABSENCE AND INCENTIVES IN PRIMARY EDUCATION:<sup>1 2</sup> RESULTS FROM A NATIONAL TEACHER TRACKING SURVEY IN ECUADOR

*High rates of absence of teachers from their posts is a serious obstacle to delivery of education in many developing countries, but hard evidence on the problem has been scarce. This study, carried out as part of a new multi-country survey project in health and education, is the first systematic investigation in Ecuador into the extent and causes of employee absence from primary schools. Data from our nationally representative survey reveals that teachers in Ecuador are absent from their posts nearly 14 percent of the time. While this overall absence rate is relatively low compared with those of other survey countries, it remains high enough that it is likely to impede learning. Moreover, it is higher in particular areas, with the absence rate exceeding 16 percent in urban areas other than Quito, and appears to be concentrated in particular teachers. We identify several important variables that are associated with increased absence: community characteristics, such as poverty and urbanization; and poor monitoring and discipline, including infrequent use of discipline by the school director, low rates of school inspections, and distance from the nearest Ministry of Education office. By contrast, we do not find strong or unambiguous effects of variables proxying for working conditions at the school, nor of monitoring of teachers by communities and parents. Finally, the findings do not support the idea that moving to non-formal or contract teachers will solve the problem of teacher absence by creating a more "incentivized" teaching force.*

6.1 Ecuador is one of the 189 countries that have pledged to meet the Millennium Development Goals (MDGs), which aim at eradicating extreme poverty and improving the living conditions of poor people. Education figures prominently in these goals: one

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1 This paper was prepared by F. Halsey Rogers and José Lopez-Calix, Nazmul Chaudhury and Jeffrey Hammer (all World Bank), Nancy Córdoba (CEDATOS), and Michael Kremer and Karthik Muralidharan (Harvard University). A preliminary version served as contribution to the World Development Report 2004.

2 The Latin America and the Caribbean Region of the World Bank (LC6) funded the survey on which this study was based, and the UK Department for International Trade and Development also provided funding for the study through its generous support for the World Development Report 2004's "Provider Absence in Education and Health" research project. We are grateful to the dedicated and professional survey enumerators at CEDATOS for their work collecting the data for this paper, and to Mona Steffen for her assistance in cleaning and preparing the survey data for this paper.

goal is to achieve universal primary education for all children by 2015, while another is to eliminate the gender gap in basic schooling.

6.2 Ecuador is on track to meet both goals, as well as other desirable educational outcomes. It has already achieved high net enrolment rates in primary education (probably well above 90 percent), and has achieved a higher average of years of schooling (7.3) than the mean for the Latin American countries. Literacy rates are also relatively high, at above 90 percent on average. Finally, Ecuador has essentially eliminated the education gender gap, with educational outcomes of the female population rising faster than that of males (Vos and Ponce, 2004).

6.3 Nevertheless, attaining the goal of universal basic education is not guaranteed. Ecuador's educational system continues to face serious problems in several areas. Access to secondary education is low, with net enrollment well below the LAC average at only 50 percent. Inequalities in access to education between urban and rural and between rich and poor are significant. Ethnic inequalities loom large, with the literacy rate for indigenous groups estimated at below 72 percent. Ecuador does spend more on education than on other social sectors, with budgeted education outlays (2.6 percent of GDP) in 2004 represented more than half of total social spending (4.8 percent of GDP); nevertheless, education expenditures are low compared to LAC average close to 5 percent of GDP. They are also on a long decreasing time trend it appears that spending on education has dropped from 4.3 percent of GDP in 1980 (Vos and Ponce, 2004). As a result of spending cuts, needed investments in education are not being made, school maintenance is minimal and teachers' salaries have been reduced in real terms. It has been argued that these changes have contributed to a higher turnover rate among teachers and absenteeism (Rojas, 2003).

6.4 Problems in the educational system go beyond limited access and limited resources. The system also features important shortcomings in its internal efficiency indicators, which relate educational inputs to outputs. The most commonly used indicators refer to repetition and desertion rates. If we compute the ratio of the number of students that completed a given level of education to the ideal number of students that would have reached that level with zero repetition and desertion, we find that it is only 88 percent; worryingly, that ratio deteriorated slightly in the 1990s. The decline in primary schooling efficiency appears to be concentrated in urban schools (Vos, 2004); surprisingly, as the analysis below will show, so does the problem of teacher absence.

6.5 Efficiency indicators like retention rates and education quality are likely to be affected by teacher absence. The little information available on absence in Ecuador suggests this is a problem, but few studies have explored it carefully. For instance, Rojas (2003) cites evidence that during the past 15 years an estimated one month per year on average has been lost because of teacher strikes, and in poorer areas an average<sup>3</sup> of nine school days per month is lost because of teachers' strikes and absenteeism. The last long school strike in Ecuador, which took place in early 2003, closed public schools for six weeks. Thus, exploring the determinants of teacher absence is a pressing subject for research.

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3 Unlike our estimates in this paper, this one was not based on direct observation of absence, nor on a representative sample of schools.

## I. Literature Review: What Do We Know about Teacher Absence?<sup>4</sup>

6.6 The problem of high levels of absence among teachers— extent, causes, and effects — has not been widely studied in a development context. Even in OECD countries, the literature on provider absence is relatively small and has failed to produce many robust conclusions.

6.7 For the case of developing countries, there are some limited findings on the *extent* of absence from primary schools, but until recently, they have been based on nonrepresentative surveys or surveys that are representative only of particular regions. For example, Glewwe, Kremer, and Moulin (1999) found that teachers in one area of Kenya were absent from school 28.4 percent of the time, and in school but absent from their class an additional 12.4 percent of the time. The 1999 Public Report on Basic Education for India found that one-third of head teachers were absent when PROBE investigators visited, sparking considerable public debate on the issue in India (PROBE Team 1999). In addition to those studies, a recent survey of primary schools in the states of Uttar Pradesh and Madhya Pradesh found that 17 percent of teachers were absent from school, and another 20 percent were at the schools but absent from their classrooms (Rao 1999; World Bank 2001). In a sample of schools in West Bengal, Amartya Sen found absence rates of 20 percent among primary school teachers (Sen 2002). In a large sample of public and private schools in the North West Frontier Province of Pakistan, the rate of teacher absence averaged 18 percent (Ali and Reed 1994; King, Orazem, and Paterno 1999). Another survey of primary schools in Pakistan found absence rates of about 10 percent in the surveyed schools (Reimers 1993). And a World Bank report on Bangladesh in the mid-1990s noted that “often 50 percent of teachers are absent, and cases where schools are functioning with only one teacher present for over a hundred children at different grade levels are not uncommon” (World Bank 1995). Overall, the problem appears from past research to be particularly serious in South Asia; new data collected in the global absence survey reported below confirms this impression.

6.8 But what these surveys lacked was an ability to assess how representative their estimates were. Before the project that produced this paper, there were very few nationally representative surveys of absence; these included most notably a survey estimating teacher absence at 15 percent in primary schools in Papua New Guinea (World Bank 2004), and another that set the rate at 17 percent for Zambian primary schools (Habyarimana et al. 2003).

6.9 On the *causes* of provider absence, a recent study on Nicaraguan schools (King and Ozler 2001) suggested that a lack of local control over schools may sometimes be responsible. Specifically, it concluded that Nicaragua’s program expanding school-level administrative autonomy and parental involvement had led to sharp increases in

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4 The term “absenteeism” is sometimes used to refer to the problem of high levels of absence among teachers and health care workers. We will generally use the term “absence” instead, because absenteeism typically implies that providers are irresponsible or derelict in their duties. While this implication is sometimes correct, we recognize that absence is often caused by exogenous circumstances, such as illness, or by official duties that take the provider out of the facility. What we are interested in investigating is the extent and causes of excessive absence, at least some of which seem likely to involve incentive structures.

attendance by teachers, with the largest improvements coming in schools in poor rural areas. Illness appears to be another major cause of teacher absence, with research indicating that teachers with HIV/AIDS are often repeatedly absent even before they reach the terminal stage of the disease (World Bank 2002). A DFID study on teacher resource centers (Fairhurst et al. 1999) notes that teacher training can itself be a cause of absence, when it removes teachers from the classroom for up to a month of training at a time, with no substitutes to cover for the teachers. In some cases, gender may play a role, as when competing demands of home and workplace contribute to high rates of absence among female teachers (El-Sanabiy 1989).

6.10 The effects of absenteeism in developing countries have not been well studied either. The analysis of NWFP schools finds that higher rates of teacher absence increase student promotion rates for a given level of test scores but reduces student continuation rates. The authors hypothesize that this is because teachers that are absent more often are less able to make accurate assessments of student progress (King, Orazem, and Paterno 1999). This study does not appear to test for the effects of teacher absenteeism on improvements in test scores. The other cited survey of primary schools in Pakistan did test for such an association, but failed to find any correlation between teacher absence and achievement levels (Reimers 1993). However, as the study looked at simple correlations without any control variables, the finding remains open to question. Clearly, there is a need for more research in this area, but the presumption should be that while merely having a teacher in place is not sufficient for students to learn, it is probably necessary.

6.11 The problem of teacher absence has received somewhat greater attention in developed countries—paradoxically, given that absent teachers are usually replaced by substitutes in rich-country schools, and thus the instructional costs of absence may be lower than in poorer countries. Nevertheless, even here the literature is sparse. On the causes of absence, one study found that more generous school district leave policies led to higher rates of absence, while more generous leave buyback provisions reduced absence (Ehrenberg, Rees, and Ehrenberg 1991). A study of teacher absence in one large school district suggests that there is persistence over time in absence — that is, the teachers who have been absent most often in the past are those who account for the most absences today — and that school employees with poorer performance ratings were absent significantly more often than average (Pitkoff 1993). A recent survey of the available studies on teacher absence concludes that there are few robust findings on its causes (Norton 1998).

6.12 In short, before this project, little was known from systematic studies based on nationally representative data about the extent and possible causes of teacher absence. If ensuring that teachers are present on the job is at least *necessary* for educational progress — even if it is not sufficient — then gaining a better understanding why so many are absent seems essential to meeting multilateral development goals in these sectors. This study aims to help fill these gaps in the case of Ecuador.

## **II. Study Approach And Methodology**

6.13 To begin to fill these gaps in our understanding of the extent and causes of provider absence, the World Bank, in collaboration with the Global Development Network,

initiated in 2002 a multi-country survey of service delivery facilities in basic health and education (Chaudhury et al. 2004). This survey encompassed seven countries—Peru, Bangladesh, Ecuador, Ethiopia, India, Indonesia, and Uganda — and the methods that were used paralleled a similar approach taken by recent studies in Papua New Guinea (World Bank 2004) and Zambia (Habyarimana et al. 2003). The objective was to gather data on absence using a common (and hence cross-nationally comparable) facility survey instrument in a representative national sample of education and health facilities in each country. (For more details on the global study, see Chaudhury et al. 2004.)

6.14 The Ecuador survey was carried out by staff of CEDATOS, a leading Ecuadorian public opinion and market research firm. The firm’s staff implemented a survey that had been designed by the World Bank’s global absenteeism study team and modified by the joint team to fit the Ecuadorian context. The primary survey instrument was an extensive survey to be administered at the level of the individual randomly selected primary school. Annex 1 describes in detail the survey instrument, sampling methodology, and related issues. The most important points to note here are the following:

- *Sampling.* The survey was administered to a *randomly selected national sample* of primary schools. Schools were clustered in parishes and municipalities randomly selected from a national sampling frame, stratified by region and by rural/urban status.
- *Survey Instrument.* The survey gathered extensive data on the schools and teachers, using a survey instrument that is comparable across countries. Information was collected through *interviews* with both the head teacher and the individual teachers, as well as through interviews and testing of a sample of students.
- *Survey Methodology.* Survey visits to schools were *unannounced*, to allow the enumerators to get an accurate assessment of typical absence rates. Enumerators did not rely on administrative records or head-teacher reports of absence, but instead *observed* all teachers and verified their presence or absence.

6.15 As a result, this Ecuador survey is part of a unique cross-national dataset that has allowed estimation of comparable teacher absence rates in six countries. Along with the companion study of Peru, it is producing the first national teacher-absence rates produced to date for South American countries.

6.16 Beyond the careful nationally representative survey of schools and teachers, we also carried out a smaller-scale survey of a nonrepresentative sample of education experts and officials to sketch out key features of the national institutional context for teacher absence. Before we proceed to the results of the school survey, Section 3 briefly summarizes the information on the institutions.

### **III. Institutional Context**

6.17 Teacher absence can take root in a context of institutional disarray, and the institutional interviews carried out for this study (described in Annex 1) confirmed substantial deficiencies in the organization of the Ecuadorian education sector. No reliable registry of regular primary-school teachers exists, nor does the central

government hold reliable and complete records of the contract teachers employed in the system. In part, the poor records may be a result of the circumscribed responsibilities of the Ministry of Education (MED). Although MED is also in theory entitled to administer the education budget, in practice it is confined to formulating policies and administering cultural affairs. The Ministry of Economy and Finance (MEF) is the agency charged with actually making decisions about payments to teachers (when they are not decentralized) and about transfers to decentralized schools. But MEF in turn, has little effect on decision-making at local levels, and on the non transparent system by which teachers are appointed

6.18 A poorly planned process of decentralization has contributed to this disarray. For instance, in the 1990s, the experience of *Redes Amigas* granted autonomy to about 2,400 schools (about 20 percent of all rural schools) in the management of their resources. In the same vein, about 1,800 secondary schools became managed as decentralized units and receive funds directly from MEF. These schools hardly consult with MED about their decision to hire teachers. Barely 10 percent of teachers are actually employed by MED at the provincial level, and data from the most recent teacher census indicate that more than 1000 public schools teachers are paid with community funds (Rojas, 2003).

6.19 Nevertheless, it is MED that formally makes teacher appointments, typically with little participation of the parents' committees. The result in an uncontrolled process of teacher appointment and transfers, as well as a relatively high level of transfers, with about 400 regular teachers transferred in 2003. Becoming a rural teacher and then transferring to an urban school, sometimes within a few months, is reportedly the simplest way to become indefinitely appointed as teacher. Our interviews confirmed indeed that most transfers were due to the teacher's own desire to get a better posting, rather than being transfers used as disciplinary devices.

6.20 Knowledge about salary levels is also poor in the education sector, making it difficult to assess the role of salaries in teacher absence. Only formally appointed teachers have a base reference salary that is known. Our interviews found that no such information is available on contract teachers, although it is believed that their total level of compensation approximately matches that of regular teachers. This is due to the myriad of bonuses and extra-salary benefits, including a frontier "bonus" of up to 25 percent of the base salary, on which little is known because of a lack of records.<sup>5</sup>

6.21 In this disarray, our interviews also found that official records on teachers' attendance are poor, sanctions against absent teachers generally very lenient, and supervisory visits to schools irregular. Although the Education Law requires a daily attendance record from principals in each school, maintenance of such records is generally considered to be poor. Our interviews found that teachers' absenteeism from class was the main reason for teacher dismissal in the schools surveyed in this study. In 2003, among 50 severe disciplinary actions taken, there were 12 dismissals, which is a high number considering the low level of inspections. As there is no incentive to have school inspectors perform their duties well, in a way that is free of corruption, school

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5 Interestingly enough, teachers were excluded from the 2003 new civil service reform law, which would have made more transparent and unified their benefits into a renewed base salary.

visits by MED inspectors are irregular, infrequent, and brief: they are estimated to take place only about 2-3 times a year, at an average duration of 1-2 hours each.

#### **IV. Descriptive Results: What is the Extent of Absence, and Who is Absent?**

6.22 In calculating teacher absence rates, we of course need to ensure that we are using the right sub-sample of the data. In the analyses below, we exclude various observations. First, we exclude an observation when the teacher is reported by the head teacher to have retired or been transferred, or to be assigned to another shift (that is, not on the current shift). Because there is no way of verifying these claims using the school-visit approach, this choice will make the overall absence estimates more conservative. Second, we further restrict the analysis to only those teachers who were reported to be working full time. Because we have already omitted teachers reported as being “on another shift,” this step should be superfluous. Nevertheless, it should remove any doubt about whether shift workers are counted as absent when they are not supposed to be on duty.

##### **A. Overall Absence Rates, Reasons, and Concentration**

6.23 In calculating absence rates, we code as absent any teacher who could not be found in the school at the time of the random visit. Restricting the sample as described above gives us a database of 1340 observations. Each observation is a teacher/round pair, meaning that in total we have about 720 fulltime teachers, observed twice each.<sup>6</sup>

6.24 With this sample, the overall teacher absence rate for 14.6 percent in the first round, and 12.5% in the second, for an overall average absence rate of 13.5 percent.<sup>7</sup> To place these figures in a comparative context, Table 6.1 gives the primary-teacher absence rates for the countries in the global project and those for which we have parallel surveys. Ecuador has the second lowest rate in this sample of countries, trailing only Peru. Cross-country analysis suggests that absence declines with per-capita income, however; given that Ecuador has the second-highest income level in the sample, its low absence rate is expected (Chaudhury et al. 2004).

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6 The exact number varies by round, since a teacher may be excluded from one round but not the other, if his employment status has changed between the two rounds.

7 The sample means in this section are adjusted using the appropriate sampling weights, to reflect differences in the probability of being selected.

6.25 What reported reasons are given for these teachers' absence? Table 6.2 shows that of the teachers who were recorded as absent by our survey enumerators, about 29 percent were out of school for reasons that would generate a leave record of some kind—that is, authorized leave and sickness. Another 18 percent were reported as being away from the school on some official duty, either teaching- or non-teaching-related.

6.26 Thus even if we take the “official duties” and leave reports at face value, we are left with over half of the absent teachers who are out of school for other reasons. This remainder – 53 percent of the sample, to be precise – was absent without any valid reason given at all. Half of this group (26 percent of the total absences) were acknowledged to be absent by the director or acting director, but without any valid reason given. The other half (27 percent of the total absences) were reported by the director to be present at the time of the visit, but could not be located in the school by the enumerators.

6.27 This list of reasons suggests how important it is to make direct observations of absence and attendance. If we were to rely on official *ex post* reports of absence, the calculated rate would be misleadingly low. Even if we assume that all the sick teachers fill out sick leave requests, and that those taking personal and administrative leave also fill out the necessary paperwork, it is possible that as few as 29 percent of teachers' absences would be picked up in any kind of retroactive assessment of absence rates based on administrative records. To put it another way, our calculated *ex post* absence rate would be 3.9 percent, far lower than the actual rate of 13.5 percent.<sup>8</sup>

6.28 Another way to look at the overall absence rates is to analyze the degree to which absence is concentrated in particular teachers. Are absences scattered among all of the teachers, or are they mostly concentrated in a small minority of teachers? The figures in Table 6.3 suggest that

**Table 6.1. Primary-school Teacher Absence, 2002-03**

	Absence Rate (%)
Bangladesh	16
Ecuador	14
India	25
Indonesia	19
Peru	11
Papua New Guinea	15
Uganda	27
Zambia	17

*Source:* Chaudhury, Hammer, Kremer, Muralidharan, and Rogers 2004 for most countries; NRI and World Bank 2003 for Papua New Guinea; Habyarimana, Das, Dercon, and Krishman 2003 for Zambia.

*Note:* Absent staff are fulltime teachers on current shift who were school at the time of an unannounced visit (see text for details.)

**Table 6.2. Reported Reasons for Teacher Absence**

	Share of absent teachers (%)
<b>Official duties</b>	<b>18.2</b>
Teaching-related duty	8.2
Non-teaching-related duty	10.0
<b>Sick or personal leave</b>	<b>29.1</b>
Sick	12.9
Authorized leave	9.9
Leave for Administrative tasks at the Ministry	6.3
<b>No Reason given</b>	<b>52.7</b>
Expected to arrive later	8.5
Left early	0.8
Don't Know	14.2
Unauthorized absence	2.7
No reason given; absence not acknowledged	26.5
<b>Total absent</b>	<b>100.0</b>

8 By contrast, if one calculated absence based on the official attendance logbook, the result would be to overstate absence rates. More than 17 percent of teachers were reported as not having signed the logbook on the day of the visit, and in another 2 percent of cases no logbook existed. Of those who failed to sign the logbook, 48 percent were actually present that day, which would make it hard to analyze the causes and correlates of absence using logbook records.



the latter is more likely. If all teachers had an equal probability of being absent, then far more teachers would be absent during one visit than during both visits. And indeed, this is the pattern seen in the other countries in the study. But in Ecuador, uniquely, the pattern is reversed, suggesting that a small minority of teachers is absent at much higher rates than their colleagues (Chaudhury et al., 2004). We lack the data to analyze this concentration of absences in detail in the analysis below, because only actual absences, and not underlying probabilities, are captured by the survey.

Nevertheless, Table 6.3 suggests that policies to reduce absence will need to distinguish between the large majority of teachers who attend at high rates and the small minority who account for much of the absence.

**Table 6.3**

**Concentration of teacher absences:  
Share of each type of teacher (%)**

	<b>Number of times absent in 2 visits</b>		
	<b>0</b>	<b>1</b>	<b>2</b>
Primary-school teachers in:			
Bangladesh	73.4	23.5	3.2
Ecuador	82.8	6.9	10.4
Indonesia	67.7	27.5	4.8
Peru	81.0	17.3	1.7
Uganda	63.0	29.6	7.4

**B. Absence Summary Statistics: Some Simple Correlations**

6.29 Before turning to multivariate analysis, we review briefly the simple correlations between teacher absence and certain geographic, individual, school, and institutional variables. Tables 6.4 and 6.5 show the mean absence rates for different categories of schools and teachers.

6.30 Table 6.4 shows the absence rates by region covered in the survey. The most striking feature of the table is the low rate of absence in the Oriente region, which is explored in the analysis in the next section. Contrary to the patterns described in a companion study of Peru (Alcázar et al. 2004), these data do not suggest *a priori* that the problem of teacher absence is concentrated in remote areas of the country.

**Table 6.4. Teacher Absence Rate and Region**

	<b>Absence Rate (%)</b>	<b>N</b>
Sierra	14.1	650
Costa	15.9	540
Oriente	3.6	168
Ecuador Total	13.5	1358

6.31 Table 6.5 lists several characteristics for which the differences in means are statistically significant. Because Section 5 discusses these factors in more detail, we review them only briefly here, to point out several intriguing relationships:

6.32 First, Table 6.5 supports the view that the problem of teacher absence in Ecuador is not one of remoteness. Teachers at rural schools have marginally lower absence rates than do those at urban schools, and teachers at the most remote schools (far from a paved road) have much lower absence rates.

6.33 Second, these correlations suggest that the supervision of teachers may matter. Despite the remoteness result, teachers working at schools that are farther from the nearest Ministry of Education office do have somewhat higher absence rates. It seems likely that distance from (and presumably reduced intensity of) supervision may be a type of remoteness that actually raises absence. Also, teachers in poor areas have higher absence rates, perhaps because poor communities lack the resources to supervise and enforce teacher attendance. And surprisingly,

teachers at schools with higher pupil-teacher ratios—who might be expected to find work more arduous and hence miss work more often—actually have relatively low absence rates. One possible explanation is that where absence would affect more students, the students’ parents and even fellow teachers monitor and punish absence more intensively.

6.34 Third, problems are concentrated in a particular class of schools. Ecuadorian schools are classified according to the number of teachers they have as either *unidocente* (single-teacher), *polidocente* (roughly, multiteacher but with multigrade teaching), or *polidocente completa* (larger schools, with at least one teacher per grade). Absence rates in the *polidocente completa* schools are far lower than in the *polidocente* schools. (*Unidocente* schools actually appear to have relatively low absence rates.)

6.35 Fourth, if we turn to look at the teacher characteristics in Table 4.4, we find few characteristics that are correlated with absence—a result that will appear also in the regression results of section 5. The largest difference is between civil servants and contract teachers,<sup>9</sup> with the latter much more often absent than the former. In addition, having a local origin and having received recent in-service training are associated with lower absence. Union members are absent more often than non-members. Other individual variables, such as gender, age, and commuting distance, are uncorrelated with absence.

6.36 Fifth, time and survey variables correlate strongly with absence. Among days of the week, absence rates are surprisingly highest on Wednesdays, rather than on Monday or Friday as one might expect. And in terms of survey rounds, enumerators found far fewer teachers absent the second time they visited a school.

6.37 These relationships are far from definitive, given that the correlations control for no other variables. But Section 5, to which we turn now, will show that many of these relationships hold up well in a multivariate setting.

**Table 6.5. Absence Rates by Significant Correlates**

	<b>Absence Rate (%)</b>	<b>Number of Teachers</b>
<b>School and Community Characteristics</b>		
Urban area	15.0	820
Rural area	13.1	520
Near paved road (< 15 km away)	7.8	1199
Far from paved road (> 15 km away)	15.0	141
Lower-poverty area (< 60% poverty)	12.3	765
Higher-poverty area (> 60% poverty)	16.9	575
School near Ministry of Education office (< 15 km)	12.5	794
Farther from Ministry office (> 15 km)	16.9	546
School has good infrastructure and equipment	11.8	459

9 Contract teachers are defined as those either listed as contract teachers by school directors or identify themselves as not having a civil-service rank.

Poor infrastructure and equipment	15.6	881
School is <i>olidocente completa</i>	12.4	959
School is <i>unidocente</i> or <i>olidocente</i>	20.3	355
School has low pupil-teacher ratio	17.9	688
High pupil-teacher ratio	10.4	652
<b>Teacher Characteristics</b>		
Civil servant	13.4	1147
Contract teacher	19.1	193
Born in this canton	11.3	617
Born in another canton	16.7	723
Received training recently (< 1 year ago)	13.0	1072
No recent training	18.3	262
Union member	15.4	923
Non-member	11.8	417
<b>Survey Characteristics</b>		
Teacher observed on a Wednesday	19.6	286
Observed on other weekdays	12.8	1054
First-round survey visit	15.7	670
Second-round survey visit	12.8	670

*Note:* All differences are significant at the 5 percent level or better. Absence rates apply to full-time teachers who would regularly have been on duty at the time of the survey visit. Averages are not weighted by sampling probability; note, however, that the differences between weighted and unweighted are small.

## V. Regression Results: What Factors May Be Causing Teachers Absence?

6.38 Many factors are likely to affect absence rates of teachers. In the description of the institutional setting for education above, we have focused on the institutional and management factors. But other factors beyond these formal incentive structures could plausibly affect attendance, including community characteristics and individual characteristics of the teachers. In this section, we analyze the data collected in the provider absence surveys to assess which factors have the greatest explanatory power. We examine each in turn, presenting the hypothesis and then discussing the evidence. As an econometric specification in the analyses in this section, we use a random-effects ordinary least squares for what is in effect a two-visit panel, with each individual teacher serving as the  $i$  variable.<sup>10</sup>

10 One alternative would be to use ordered probit; under this alternative, the dependent variable would be the number of times a teacher had been absent over the two visits (0, 1, or 2). Our specification has the advantage of making use of the information for teachers who are in the dataset for only one of the two visits—for example, those who were on staff at the time of the first visit, but had been transferred

## A. Explanatory Variables: Community and School Characteristics

6.39 In assessing the causes of provider absence, we start with the factors at the community and school levels – that is, the environment in which the teacher makes his or her attendance decisions, rather than the teacher’s own characteristics. These regressors are included in column (1) of Table 6.6 below.

6.40 *Community Characteristics. Remoteness and Poverty.* The characteristics of the community where the school is located may be important determinants of absence. Here, we focus on whether the community is remote, rural, or poor. These characteristics may affect absence through various conduits, including the desirability of the posting and the teachers’ opportunity cost of attendance.

6.41 *Rural and Remote Schools.* Worldwide, the problem of provider absence in health and education is often thought to be concentrated in remote rural areas, as in the case of primary school teachers in neighboring Peru (Alcázar et al. 2004) or in Papua New Guinea (World Bank 2004). Teachers and medical personnel in developing countries tend to have characteristics—such as relatively high education levels and an urban background—that might lead them to prefer urban life, both for the amenities that such areas offer and for the opportunities for outside income.<sup>11</sup>

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before the second visit. A second alternative would be random-effects probit. While that alternative makes sense, given that the dependent variable (whether the provider is absent) is a 0,1 variable, the random-effects OLS has the advantage that coefficients are immediately interpretable as the marginal effects of a one-unit change in the regressor. And significance results are highly robust to the approach used: the probit results closely track the OLS estimates, generally giving similar coefficients with much higher precision.

11 In the popular imagination in many countries, the archetypal absent provider is probably the teacher or doctor who rarely shows up at his rural post, so great is his urban orientation and his disdain for the uneducated rural populations.

**Table 6.6. Correlates of Teacher Absence (Random-effects OLS)**

	(1) Community & School Characteristics	(2) (= (1) + Teacher Characteristics)
Urban area	0.1695** (0.0389)	0.1803** (0.0386)
Paved road > 15 kms away	-0.1248* (0.0494)	-0.1207* (0.0492)
Poverty rate (for parroquia where school is located)	0.0024** (0.0009)	0.0026** (0.0009)
Discipline: Index of past actions (weighted)	-0.0187** (0.0044)	-0.0197** (0.0043)
Min Educ office > 15 kms away	0.1677** (0.0339)	0.1813** (0.0334)
PTAs: Share of schools in district with recent meeting	-0.0478 (0.0829)	-0.0562 (0.0826)
Infrastructure: School has toilet facilities	-0.0493 (0.0725)	-0.0519 (0.0721)
Infrastructure: Good score (top one-third of schools)	0.0706** (0.0264)	0.0621* (0.0262)
Multigrade (reported)	-0.2634** (0.0448)	-0.2673** (0.0443)
School is 'polidocente completo'	-0.2054** (0.0388)	-0.1822** (0.0385)
Pupil-teacher ratio	-0.0053** (0.0014)	-0.0051** (0.0014)
Observed on Tuesday	0.0703** (0.0202)	0.0700** (0.0205)
Observed on Wednesday	0.0839** (0.0225)	0.0901** (0.0227)
Observed on Thursday	0.0405+ (0.0227)	0.0418+ (0.0230)
Observed on Friday	-0.0107 (0.0238)	-0.0089 (0.0241)
Dummy for second round of observations	-0.0443** (0.0103)	-0.0472** (0.0105)
Female		-0.0032 (0.0164)
Teacher holds educational certification (titulado)		0.0613 (0.0440)
Age		-0.0095 (0.0058)
Age squared		0.0001+ (0.0001)
Tenure		-0.0036 (0.0028)
Tenure squared		0.0001 (0.0001)
Contract teacher (non-civil-servant or lacking CS rank)		0.0780* (0.0363)
Local ties: Teacher was born in this canton		-0.0274+ (0.0159)
Education: Instituto superior graduate only		0.0341 (0.0292)
Education: Bachelor's graduate or higher		0.0069 (0.0231)
Long commute (>30 minutes)		-0.0126 (0.0194)

Training: Teacher received training in past 12 mos.		0.0511 (0.0578)
Training: Teacher received training more than 12 mos. ago		0.0539 (0.0607)
Teacher holds outside employment		-0.0158 (0.0167)
Union member		0.0315+ (0.0185)
Constant	0.2440* (0.1240)	0.2947+ (0.1756)
Day-of-week dummies included?	Yes	Yes
Teacher age and tenure variables included?	Yes	Yes
Observations	1314	1308
Number of teachers	663	659
Wald chi2	144.1123	167.3302
Standard errors in parentheses		
+ significant at 10%; * significant at 5%; ** significant at 1%		

6.42 There are at least two major reasons why rurality and remoteness might increase absence rates—one logistical, the other motivational. First, from a logistical perspective, it may simply be more difficult for teachers in remote locations to make it to school on time, even if they fully intend to do so, because of the unpredictability of transportation or the need to travel farther to reach facilities such as banks and post offices. Second, from the perspective of teacher motivation, urban-educated teachers may find remote posts less attractive—because those posts are farther from friends and relatives, because they lack cultural and other amenities, or because they offer few outside earning opportunities (such as private tutoring). Teachers in these remote locations may spend more time away from their postings, for example heading to urban areas for long weekends and extended holidays.

6.43 On the other hand, remoteness could in theory reduce provider absence. If the area around the school offers few temptations for alternative pursuits—whether leisure or alternative employment—the teacher may decide that teaching school is the best use of his or her time during school hours.

6.44 As it turns out, in Ecuador absence is at least as much an urban problem as a rural one. The cross-tabulations in Table 6.1 showed that rural teachers are actually slightly less likely to be absent than their urban counterparts, and the multivariate regressions in Table 5.1 strengthen this conclusion. After we control for other variables – most notably poverty, which is lower in urban areas – we find that for a teacher in an urban school, the predicted absence rate is 16 to 18 percentage points higher than for a teacher in an otherwise similar urban school.

6.45 A more explicit way of checking the remoteness hypothesis is to measure the actual distance of the school from amenities of interest.<sup>12</sup> We used as a summary measure of remoteness the distance to the nearest paved road, since having a paved road nearby will lessen the effective distance to most of the other facilities. In Table 6.6, the measure used is a dummy variable that takes the value of 1 when the school is at least 15 km from the nearest paved road. Again, we see that remoteness is not associated with higher absence rates. In fact, the opposite is true: more remote schools have absence rates that are 12 percentage points lower than other schools.

6.46 These results support the hypothesis that in Ecuador, the primary force driving absence is not likely to teacher’s antipathy to rural areas. Instead, they suggest that the culprit may be

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12 Because the area around the school could be officially designated as rural and yet be near a major city, the remoteness variable is worth including for its effects beyond the official rural status of a village.

nearby amenities and employment may be causing teacher absence—the “pull factors” that lure the teacher away from school.

6.47 *Poverty Rate.* Like remoteness, the level of poverty in the school’s community could conceivably be associated with either higher or lower absence. Higher poverty could mean poorer supervision and monitoring by less educated parents; it could mean greater social distance between well-educated teachers and poor students and families, reducing the possibility of social sanctions against absenteeism; and it could reduce the teacher’s willingness to live in the community fulltime. Each of these factors would tend to increase teacher absence. On the other hand, a poorer community may offer the teacher fewer opportunities for outside income-earning, making him or her less inclined to skip work for outside employment.

6.48 Table 6.6 includes as a regressor the poverty rate for the parroquia (sub-provincial geographical unit) in which the school is located. Poverty is associated with much higher rates of absence: increasing the poverty rate by just one standard deviation increases the predicted probability of absence by more than 5 percentage points.

6.49 *Monitoring and Discipline.* One possible deterrent to opportunistic teacher absenteeism is monitoring and discipline, whether carried out by the school director, the Ministry of Education, or the community. This section assesses each of those in turn.

6.50 *School-level Discipline.* First, attendance may depend on the management style of the school director, including his or her willingness to use disciplinary measures when necessary. In the school survey, head teachers were presented with a list of disciplinary measures, and asked in turn whether they had ever used each of the measures to discipline teachers. From this survey data, we have constructed a severity-weighted index of the disciplinary intensity of the school director.<sup>13</sup> Table 6.6 shows that this measure is highly significant: teachers at schools whose directors have used more discipline in the past are considerably less likely to be absent. An increase of just one standard deviation in the discipline index is associated with a reduction in absence of 6 percentage points.<sup>14</sup> This result suggests that monitoring by school directors, if it is accompanied by disciplinary action, may be able to reduce absence.

6.51 *Official Inspections.* Another second possible mechanism for inducing higher effort levels by teachers is frequent inspections by district or Ministry of Education officials. If there are any sanctions associated with poor performance, exercised on either the teachers themselves or the school director, then the possibility of unforeseen monitoring could induce higher attendance.

6.52 Gauging the effect of inspections is not straightforward, however. If we were to include the frequency of school-level inspections as a regressor, that might not be a good test of whether inspections have an effect, because there may be an opposing, reverse causation. If serious attendance problems at a school may induce inspectors to visit the school more often, that would dampen or even reverse the expected relationship between inspections and absence.

6.53 To get around this problem, in Table 6.6 we include as a regressor the distance to the nearest Ministry of Education office. The theory here is that, once we control for other measures of remoteness, schools that are farther from external supervisors will be inspected less often and therefore will have higher absence rates—for reasons unrelated to the level of absence at the

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13 The index is weighted as follows: six points are given for dismissal of a teacher, five points for suspension of a teacher or withholding of pay, and so on, down to one point for an oral warning to an offending teacher. While in theory it could range from 0 to 23, in the data it ranges only up to 13.

14 We might surmise that the actual effect of discipline is even larger, given that the discipline index could suffer from the same offsetting reverse causality problem as the inspections measure: at a school that has had severe attendance and other behavioral problems in the past, the director is more likely to have had to use severe disciplinary measures.

school. In Table 6.6, the expected correlation comes through strongly: teachers at schools more than 15 km away from Ministry offices have predicted absence rates 16 to 18 percentage points higher than schools close to Ministry offices.<sup>15</sup> We take this as evidence that inspections are associated with lower absence.

6.54 *Parental Involvement.* As discussed in the literature survey, an emerging strain of the education service-delivery literature emphasizes the positive role that community involvement can play in school management. Studies from El Salvador and Nicaragua, to mention just two examples, suggest that giving greater discretion to parents and communities can reduce teacher absence and improve student test scores. The most obvious vehicle for parental involvement in the management of Ecuadorian primary schools is the parents' association (Comite de Padres de Familia, or CPF). As with inspections, we created a dummy variable indicating whether that association had met recently (defined as either "this month" or "last month").<sup>16</sup>

6.55 The results do not support a community-monitoring story. More active parents' committees are actually associated with higher teacher absence, probably because high levels of absenteeism spur a parents' committee to become more active. Again, to circumvent this problem of school-level reverse causality, we include in Table 6.6 an alternative measure of parents' committee activity: the share of the province's schools that have had recent CPF meetings. However, the estimated coefficient is not significantly different from zero.

6.56 Frequency of CPF meetings may not fully capture the effectiveness of the parental efforts to influence school management. What may be most important is having informed and influential parents, who have the knowledge and connections necessary to discipline a school director or individual teachers if their behavior is unsatisfactory. This pressure might be channeled through the CPF, but there may well be other mechanisms, including direct appeals to government officials and social pressure.

6.57 What is the best measure of parents' ability to influence the school? One obvious candidate is parents' education level, since more educated parents are likely to have both higher expectations of schools and greater resources to enforce those expectations. Another candidate is the size of the financial contributions that parents are required to make to the CPF. However, neither variable enters significantly in these multivariate regressions (and both are omitted from the Table 6.6 specification). Taken together, the evidence in this subsection does not suggest that parental involvement is a powerful force for reducing teacher absence in Ecuador.

6.58 *Working Conditions at the School.* Another set of factors that may influence teacher absence is the quality of the workplace and of the work. The previous subsection focused on external rewards for attendance, in that monitoring and discipline hold the threat of salary losses for absent employees, or perhaps social sanctions levied by the community. But non-pecuniary factors at the school may also be important in reducing absence; this section assesses that possibility.

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15 An alternative approach to estimation is to include the average inspection intensity for other schools in the province. This intensity should not be affected by the absenteeism at the teacher's own school, but may well capture how carefully the Ministry supervises schools in the area. When we include this variable, we find that provinces with greater inspection intensity have lower absence, even controlling for the distance to Ministry offices. (That result is not shown here, because it limits the sample slightly.)

16 Because virtually all of the teachers in the sample teach at schools reported to have an CPF, merely entering a CPF dummy variable will not be fruitful. Instead, we need to measure the activity level of the CPF, to distinguish those that are moribund from those that are active enough to influence the school director.



6.59 *School Facilities and Infrastructure.* First, like other employees, teachers are likely to prefer a workplace that has more amenities and comforts, as well as better school supplies. In the survey, we collected information on a variety of aspects of school facilities and types of supplies and equipment. For this regression, we use as a summary measure a dummy variable indicating whether the school has toilets of any kind.<sup>17</sup> Here, the results are ambiguous; the coefficient is negative but not significant in the regressions reported in Table 6.6, but it is highly significant in the alternative probit specification.

6.60 But this result, even if it does hold, applies only to the small percentage of schools that lack toilet facilities. On the broader question of infrastructure quality, the result clearly runs in the opposite direction: the schools that score highest on an index of infrastructure and equipment have absence rates 6 to 7 percentage points higher than other schools. We do not interpret this to mean that better infrastructure deters teachers from attending, but it does suggest that, beyond some minimal level of acceptability, facility quality plays little role in absence.

6.61 *Multigrade Teaching.* Another measure of working conditions is multigrade teaching. Reviews of multigrade teaching point out that this system can be frustrating and alienating for teachers, particularly if they are not assisted in developing approaches tailored to the multigrade setting (Little 1995; UNESCO/APEID 1989). In some other countries, multigrade teaching appears to be strongly associated with absence, and Table 4.4 showed that in Ecuador, schools with multigrade teaching had higher absence rates.

6.62 In Ecuador, however, the results on multigrade teaching are ambiguous. Teachers at schools that were self-identified as using multigrade teaching actually had a vastly lower predicted rate of absence (26 percentage points lower) than those at other schools. But the next variable in Table 6.6, indicating whether the school is *polidocente completo*, points the other way. As noted in Section 4, Ecuadorian schools are categorized as either *unidocente* (single-teacher), *polidocente* (multi-teacher, but with fewer class teachers than grades), and *polidocente completo* (multi-teacher and “complete”, in the sense of having more teachers than grades). Here, the teachers at *polidocente completo* schools have predicted absence rates 18 to 20 percentage points lower than those at other ostensibly multigrade schools. Because the *unidocente* and *polidocente* schools often have more teachers than implied by their official categories, however, the interpretation is not straightforward. Detailed analysis suggests that absence is concentrated in the larger *polidocente* schools (those that have more than seven teachers, and hence are not likely to use multigrade teaching).

6.63 *Pupil-teacher Ratio.* A third, related measure of working conditions is the school’s pupil-teacher ratio. We might hypothesize that teachers at schools with higher pupil-teacher ratios will be absent more often, if the heavy workload reduces the teacher’s motivation. Conversely, a higher pupil-teacher ratio might mean that a teacher is under greater pressure to avoid being absent: there are more parents to monitor the teacher’s presence, and other teachers may be more resentful of having to double up large classes when a colleague is absent. Here, the latter effect appears to dominate: higher pupil-teacher ratios are associated with lower absence. Moreover, the effect is large: increasing the ratio by one standard deviation reduces predicted absence by 5 percentage points. At a minimum, this result does not support the working conditions hypothesis.

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17 At first blush, we might want to use a dummy for “functioning latrines,” rather than simply latrines, since non-functioning toilets are unlikely to help morale. But “functioning latrines” may be endogenous—if fewer teachers show up at school, there will be fewer staff members around to make sure the latrines work properly. We had two indicators of types of toilet facilities – letrinas and cubiculos sanitarios. We chose to use the latter indicator (translated here as bathrooms), which fewer schools had. If instead we use a “no toilet facilities” dummy, we get roughly similar results (with the opposite sign, of course)

As hypothesized in Section 4, it may instead support the notion that supervision is important. If being monitored by a larger number of parents discourages absence, then this could lend some support for the community-monitoring hypothesis dismissed in the previous sub-section.

6.64 *Competition from Private Schooling.* Another possible source of performance pressure on school directors and teachers is competition from private schools in the local area. If at least some students have a credible exit option, the public schools may feel pressured to improve their performance.<sup>18</sup> But threat of losing students is not the only channel through which a private alternative could affect performance. Private schools may also serve as a benchmark for performance, by showing parents what quality of education is attainable under local conditions with a given level of resources. If either of these effects is at work, then the availability of private schooling in the area should be associated with lower teacher absence. Results of this analysis are not shown in Table 5.1, because of problems of missing observations. Teachers at schools in communities where private competition is reported have a predicted absence rate 7 percentage points below those where there is reportedly no private school.

## **B. Explanatory Variables: Teacher Characteristics**

6.65 Beyond the community characteristics, the characteristics of the individual teacher—training, background, age, gender, marital status, level—may affect attendance. Teachers are heterogeneous in their motivation and circumstances, and this heterogeneity may both affect absence and be correlated with exogenous characteristics.

6.66 Column 2 of Table 6.6 adds teacher characteristics to the regression, but the effect of these additional variables is minor. Only one of the teacher-level variables is significant at the 5 percent level, and that variable is the one most closely related to institutional structures: the teacher’s contract status. Nor does the inclusion of teacher-level variables have any material effect on the estimated coefficients reported in Column 1. These results suggest that in Ecuador, absence is driven substantially by community and school-level factors rather than by teacher characteristics.

6.67 *Gender.* One obvious characteristic to explore is the gender of the teacher. As with some other characteristics, being a woman could have offsetting effects on absence. We might expect that working women will have more family responsibilities that are likely to keep them away from the workplace, as noted above; in this case, women will have higher absence rates than men. Alternatively, it could be that women have fewer outside work opportunities, are less likely to be assigned administrative non-teaching tasks that take them away from the school, or are simply more concerned with the welfare of the children. Any of these factors could lower their absence level compared with that of men. Table 6.6 suggests that in the case of Ecuador, gender is uncorrelated with absence. This result is consistent with the cross-tabs of Section 4, which showed little difference between women and men.

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18 It is not clear at first glance why public-school teachers should feel threatened by loss of students. After all, if their jobs are secure, doesn’t this simply reduce their workload? But according to Indian government officials at a recent multicountry workshop on absenteeism organized by the authors, there are incentives here. First, they argued, the school director and teachers lose social standing if they are not able to attract and keep students. Second, there is at least theoretically a risk that the school could be closed or consolidated with another if it loses too many students, perhaps resulting in a disruptive transfer for the teacher.

6.68 *Intrinsic Motivation.* Where monitoring and discipline are ineffective, the teacher's attendance may be determined largely by his or her level of non-pecuniary motivation. Notably, a teacher may be motivated by professionalism. One possible proxy for motivation is educational specialization, in that a teacher trained in pedagogy may be more professionally motivated than a teacher who studied another subject. We have included in this regression a dummy indicating whether the teacher is *titulado*—that is, whether he or she has a certification in education. A second measure of professional motivation is past exposure to in-service training, in that good training may increase a teacher's desire to perform well. Third, if teachers enter the profession highly motivated, but “burn out” after a number of years of service, then motivation and attendance may decline with age. As Table 6.6 shows, these potential professional motivation variables—certification, training, and age—do not enter significantly in predicting absence rates. (Age is not shown here, because it is not significant at 5 percent, nor does it have the predicted sign.) While underlying professional motivation may matter for attendance, the proxies tested here do not pick it up.

6.69 A second set of possible non-pecuniary motivations concerns attachment to the local community. If local social pressure and intrinsic orientation toward service to the community are important, then we might expect teachers who come from the area near the school to have lower absence rates. (Conversely, if local teachers' greater attachment to the area translates into better out-of-school income-earning opportunities or weightier family responsibilities, there may be more factors pulling the teacher out of school.) Table 6.6 shows that a teacher was born in the canton where the school is located does have a lower predicted probability of absence, but the effect is small and not very significant. Another, more physical measure of ties to the area—the length of the commute faced by the teacher—has no effect at all. Nor does a third measure of local ties, the teacher's tenure at the school.

6.70 *Pecuniary Incentives—Contract Status.* A basic model of incentives would suggest that the teacher's contract status might affect his or her incentives. Regular (civil-service) teachers have tenure and face few salary incentives for good performance; by contrast, one might expect that contract teachers would be willing to exert more effort on the job, at least if they have some possibility of a reward at the end of the contract period. If their performance affects the probability of this reward, then contract teachers may have lower absence rates than regular teachers.

6.71 To test this hypothesis, we include in Column 2 a dummy variable for contract teachers, defined as those who were identified as contract teachers by the school respondent or who self-identified as not having a civil-service rank. Table 5.1 offers no evidence for the hypothesis that contract teachers will have an incentive to exert greater effort than regular teachers do. In fact, contract teachers are predicted to have absence rates 8 percentage points than civil servants do. Further investigation shows that for the largest class of contract teachers—those not hired by the school—the predicted absence rate is higher still.

6.72 What might account for this perverse effect of contract status, which is also found in Peru and Indonesia? There are various possibilities, which are explored in the companion project paper on Peru (Alcázar et al. 2004). Contract teachers could face greater logistical challenges or be required to carry out more non-teaching duties, but it is also possible that they feel less attachment to the teaching force and hence have to spend more time exploring or engaging in alternative employment. Whatever the motivation,

these results suggest that from the perspective of attendance, reducing the security of teacher tenure may not lead to higher-quality service delivery in education.<sup>19</sup>

6.73 *Opportunity Costs of Attendance: Outside Employment.* In the absence of effective monitoring and discipline, the teacher's attendance decision will depend in part on the opportunity cost of her time. If she has other income-earning work outside the school, her financial opportunity cost is likely to be higher, perhaps increasing her absence rate. But Table 5.1 provides no direct support for the outside-income story, as the coefficient is small and insignificant.

6.74 *Union Membership.* Finally, we test the effect of union membership. Union members might be expected to be more aware of the shortcomings of teachers' working conditions and rewards than other teachers, assuming that the union is an activist one. In fact, the union led a national teachers' strike in May 2003, a few months after these data were gathered. In Table 6.6, the teacher's union membership does appear, but it is small and only mildly significant, suggesting that unions are not a major factor in absence.

## VI. Conclusions and Policy Implications

6.75 The analysis of the correlates of absence in the previous section suggests several conclusions that may have implications for policy. It is essential to point out that none of these statistical associations establishes a casual relationship, so they should be taken as pointing the way for more in-depth investigation of the causes of absence. However, in this concluding section we lay out some of the policy implications that may follow, if these results are borne out by future research:

- Teacher absence in Ecuador appears to be driven primarily by features of the school, community, and institutional environment—some of which should be amenable to policy—rather than by individual characteristics. Age, tenure, education, region of origin, union membership, commuting time, even outside employment—none of these is strongly correlated with absence rates. The only individual characteristic that matters much is an institutional one, the contract status of the teacher (see below). In a sense, this should be encouraging: it means that reducing absence will depend in part on addressing systemic teachers incentive weaknesses, rather than targeting classes of teachers whose characteristics might not be easy to change. However, it also suggests that it will not be enough simply to hire the right teachers and hope that they do their jobs. At the community level, the poverty level is a strong predictor of absence, suggesting that poverty mitigating approaches, like school breakfast or cash-transfers programs, might have the effect of reducing absence.
- The “sticks” of inspections and discipline may be important in reducing absence. Both the province-level inspection intensity and the record of past discipline are strong predictors of lower absence, suggesting that these “sticks” may have a role in reducing absence further. The importance of inspections is perhaps unexpected,

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19 Of course, an assessment of the efficiency of contract teachers depends not only on their performance—measured by attendance, as well as by other measures of quality and effort—but also on their cost. If contract teachers are much less expensive than regular teachers, school systems may gain by employing more of them, even if they perform less well. This analysis suggests only that contrary to what might be expected, contract teachers may not exhibit perform better on the key metric of attendance.

given that Ecuadorian education experts report that inspectors generally do not make frequent surprise visits. But the importance of inspections is reinforced by the strong effect of distance from a Ministry of Education office. Schools that are farther away from a ministry office (and thus presumably inspected less often) have higher absence rates—even though remote schools in general have lower absence rates.

- More generally, there are indications that “pull” factors—perhaps including cultural amenities and alternative employment—may increase absence in urban areas. Contrary to the experience in many other countries, teachers at urban schools in Ecuador have much *higher* absence rates (15 percent) than those at remote rural schools (7.8 percent), with particularly high rates in urban areas outside Quito (16.2 percent). This urban absence effect holds up strongly in multivariate analysis. This is the reverse of the pattern often found in other countries, where less desirable rural posts suffer higher absence rates. A possible explanation is that less isolated areas offer more amenities or employment that can lure a teacher away from school. While detailed policy implications of this conclusion are not obvious, it does suggest that in Ecuador—unlike many other countries—efforts to combat teacher absence should start in urban areas. Urban *polidocente* schools in particular merit further investigation: their 27.6 percent absence rate is double the national average.
- Community involvement in the schools does not have clear effects in reducing absence. Schools in provinces with more active parents’ committees do not have lower absence rates, in contrast to what might have been expected from studies in other countries. Nor do other indicators of potential parental influence, such as parental literacy levels or financial contributions, predict lower absence rates. This does not imply that parental or community involvement in school management is a bad idea, but merely that it may not help on the absence front as might be expected.
- Nor are contract teachers—that is, teachers who presumably face a greater threat of punishment for non-performance—a simple fix for absenteeism. The major teacher-specific characteristic highly correlated with absence is the teacher’s contract status. Notwithstanding expectations that they might have greater incentives for at, contract teachers who have not been hired at the school level are absent at much higher rates than are regular civil-service teachers. Contract teachers hired by the school, while they do not suffer from the same absence problem, also fail to attend at any higher rates than do regular teachers. Governments may want to hire contract teachers for other reasons than budgetary savings, since salary levels are similar to those of regular teachers, once fringe benefits are included. Reasons like high turnover rates, especially in poorest rural schools, or the need to fill the gaps left by transferred teachers might explain this decision. But our findings show that, in any case, authorities should not presume greater teaching effort from contract employees.
- How much does it matter whether the government can lower teacher absence? This analysis has been based on the assumption that excessive teacher absence will have costs. One way to assess the magnitude of these costs would be to attempt to measure the student learning forgone as a result of teacher absence; a subsequent study will do this. But a second approach would be to calculate the budgetary waste from absence—the amount of salary expenditures that go to teachers who are absent without good reason. To make a rough calculation of these magnitudes, take as a baseline the half of absent teachers (or 6 to 7 percent of all teachers) whose absence is not reported or excused by school directors. According to our companion institutional survey, the salary costs for a teacher might be between \$100 and \$200 per month. Ignoring non-monetary fringe benefits and multiplying over 86,000

primary-school teachers, this suggests a rough absence cost of about \$500,000 a month, or about \$6 million per year. Alternatively, a cost can be calculated based on the \$300 million per year that Ecuador spends on primary education. About 80 percent of this goes for teacher salaries, meaning that the budgetary cost of excessive teacher absence might be some \$18 million per year. It should be underlined that these back-of-the-envelope estimates are merely suggestive, and that most teachers appear to be attending well. Nevertheless, the estimates suggest that modest programs to reduce absence, such as targeted inspections and increased discipline in urban schools, could pay off substantially through reduced waste. The data on concentration of absence rates are sketchy, since they are based on only two visits, but they suggest that in the Ecuadorian case, it might be particularly fruitful to try to improve the attendance of the relatively small fraction of teachers who are often absent.

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## **Annex 6.1: Survey methodology and sample selection**

This annex describes the survey and sampling approach used in gathering the data on school service delivery, discussed briefly in Section 3.

### **School survey procedures and instrument**

Data were gathered primarily through surveys of school directors and individual providers, carried out during unannounced visits to a random sample of schools. The survey instrument used in these school visits was intended first and foremost to establish a good estimate of the absence rate of providers at the school. To avoid contaminating the responses, the instrument and survey methodology were designed in such a way that they did not focus too heavily on attendance and absence questions. Instead, they collected a broad range of variables on the school and individual providers.

In filling out the survey, the enumerator met first with the school director in order to collect *school* information. If the director was absent, the enumerator met instead with the acting director or, failing that, any staff member who was willing to answer questions about the school. From the director, the enumerators obtained a list of the personnel (teachers or medical personnel) who were supposed to be working in the school, as well as their work schedules; this list served as the sampling frame for the observation of attendance and the surveys of providers. But in addition, the enumerator collected the following data on the school from the director:

- staffing and attendance: size of school and number and names of teachers assigned to it; presence or absence of each worker on the day of the visit, as well as the reasons for any absences
- school hours, services, and usage: the hours that schools are supposed to be in operation; usage by students
- remoteness of the school, measured by distance to (for example) the provincial capital or the nearest paved road or bank
- community characteristics, such as primary languages of students
- parental, community, and employee involvement in school management
- monitoring and supervision (frequency and type)
- disciplinary procedures used at the school and in the region
- school finances, including sources and uses of funds
- characteristics of the school

After obtaining a list of the personnel who were supposed to be at the school on the day of the visit, the enumerator selected a sample of *providers* to be interviewed. Where there were 15 or fewer teachers or medical personnel in the school, all were included in the school sample; where the total exceeded that number, then 15 were selected randomly for interviews. The enumerator then worked his or her way through that list twice. The first



circuit was the direct observation of attendance, aimed at verifying directly the presence or absence of each provider on the list; these direct observations provide the basis for the calculations of absence later in this paper. The goal of this first circuit of provider visits was to ensure that the measure of provider absence was as uncontaminated by the enumerator's presence as possible. If instead the enumerator had stopped in each room long enough to interview the provider before verifying the presence of the other providers on the list, it is possible that the director would have had time to get word to absent providers that they should return to the school in time to be enumerated.

Once the enumerator had recorded the attendance of each of the sampled providers, he or she then made a second circuit to carry out detailed provider interviews. Like the school-level interviews with the director, these interviews aimed to collect information on all of the correlates that seemed most plausibly related to absence and its effects:

- provider activity at the time of the visit
- demographic characteristics
- rank of the teacher
- educational background of each teacher
- job tenure and work history
- ethnic group and mother language of the teacher
- training and preparation for the job
- marital status and number of children
- commuting logistics
- ties to the local community
- outside income-earning opportunities
- information on the logistics of the teacher's pay
- motivations for career choice and current level of job satisfaction

Finally, there was a third module of the school survey instrument, administered to a sample of students. Specifically, enumerators selected a random sample of fourth-grade students during the second visit. Their teachers answered a very brief survey about the family backgrounds of these students (with help from the students if necessary), and the students were then asked to take a simple mathematics and language test. This test was intended to provide at least a crude metric of the educational outcomes that teacher absence would be presumed to impede.

Following the survey design, every school in the sample was visited twice by enumerators. Having multiple observations over time was aimed in part at helping us determine whether absences are concentrated among a few teachers, or are more spread out. This information could help shape policy. For example, a 10 percent absence rate could arise because all workers are absent 10 percent of the time, or because 5 percent of workers never show up while the majority are rarely absent. In this case, policies targeted

at the latter group would not threaten the majority of teachers. On the other hand, if all workers are absent 10 percent of the time, improving service delivery will require different measures. Repeat visits will help us understand which approach to solving the problem will be most promising.

Probably more important, the second visit also allowed collection of detailed individual-level data from teachers who were absent at the time of the first visit. This data allowed us to obtain much richer insights into the question of who is absent and why— detail that would be lacking had we surveyed only the teachers who were never absent. Without the second visit, all individual data on absent teachers would have had to come from directors or co-workers, increasing the noise of the responses.

### **Sampling Methodology<sup>20</sup>**

The sample for the school survey consisted of 102 primary schools, with two schools surveyed in each of 51 *parroquias* (or town) selected randomly.<sup>21</sup> To reduce fieldwork costs, the sample was selected using multi-stage clustering, as follows:

- First, the sample was stratified geographically into the three regions described above – Costa, Sierra, and Oriente. Within each region, a given number of *parroquias* were chosen randomly on a probability-proportionate-to-population (PPS) basis. The number chosen was based on the relative population of the three regions, so as to yield the following number of *parroquias* in each region: 23 in Costa, 22 in Sierra, and 6 in Oriente.
- Municipios and parroquias were chosen as follows, with stratification by rural/urban status:
  - In the Sierra region, 14 rural and 8 urban parroquias were chosen, reflecting the rural/urban breakdown in that region. To do this, CEDATOS first selected 14 municipios, on a randomized PPS basis (with replacement). From the list of urban parroquias in those 14 municipios, 14 were chosen on a PPS basis; similarly, from the list of rural parroquias in those 14 municipios, 8 were chosen on a PPS basis.
  - In the Costa region, 11 rural and 12 urban parroquias were chosen in the same way (i.e., first 12 municipios will be chosen, and then the rural and urban parroquias were selected from those municipios).
  - In the Oriente (Amazon) region, 4 rural and 2 urban parroquias were chosen in a similar procedure. In this region only, because of the inaccessibility of many villages, some parroquias were chosen using PPS sampling with an additional sampling weight given by a pre-defined accessibility parameter. This diminished the probability of selecting very inaccessible parroquias (for cost reasons), without eliminating such them

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20 May want to move detailed discussion to appendix.

21 Because the parroquias were selected with replacement – i.e., a parroquia could be selected more than once if it came up randomly multiple times—the actual survey included 41 distinct parroquias. (Double-check with Nancy.)

from the sampling frame altogether. In calculating the overall mean absence rate for Ecuador, the observations were therefore reweighted to reflect this intentional undersampling of the most remote locations.

- Once the 51 parroquias were selected, two schools were chosen randomly from each parroquia. The randomization was carried out on a PPS basis, using as population weights the official school enrolments.

Note that while the school sample selection process was centralized, the sampling of individual teachers occurred at the facilities during the field visits, as described above. The sampling frame at this level was the list of employees provided by the school director; the enumerator then either interviewed all of the teachers, or—for larger schools—interviewed 15 randomly chosen teachers. (We adopted this cutoff to keep the survey a manageable size and cost.)

### **Companion National Institutions Survey**

To complement the data collected through questionnaires at the school and individual level, we carried out a parallel effort to gather information on the national institutional environment for the education and health sectors. This institutional survey drew primarily on central government sources to illuminate such topics as: provider types, numbers, and qualifications; provider work hours and excused absences; provider salaries and benefits; recruitment, assignment, and transfer policies; provider participation in school management; private providers and the institutional environment; discipline and dismissal procedures; local involvement in personnel decisions; incentive schemes for attendance; and unionization. To illuminate these topics, we drew both on codified information about the formal institutions and subjective assessments of how these institutions work in practice. We collected this information by drawing on existing sources and by surveying higher-level education and health officials, non-government experts, and a subsample of providers during school-level survey work. Many of the results of this institutional survey are presented in Section 3 below, while others appear in the discussion of the results in

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