

Teacher Attrition and Absenteeism in Zambia

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List of Abbreviations

BESSIP	Basic Education SubSector Investment Programme
DEO	District Education Office
EFA	Education for All
EMIS	Education Management Information System
ESDS	Expenditure and Service Delivery Survey
GDP	Gross Domestic Product
GER	Gross Enrollment Rate
GNI	Gross National Income
GNP	Gross National Product
MDG	Millennium Development Goals
MOE	Ministry of Education
MOE-TED	Ministry of Education Teacher Education Department
NER	Net Enrollment Rate
PEO	Provincial Education Office
PRSP	Poverty Reduction Strategy Paper
PETUZ	Primary Education Teacher Union of Zambia
PTR	Pupil Teacher Ratio
RTI	Research Triangle Institute International
TSC	Teaching Service Commission
TTC	Teacher Training College
UNZA	University of Zambia
ZATEC	Zambian Teacher Education Course
ZATERP	Zambian Teacher Education Reform Program
ZNUT	Zambian National Union of Teachers

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Executive Summary

This study describes a detailed examination of teacher absenteeism and voluntary teacher attrition in Zambia. RTI International staff carried out the fieldwork and background research upon which this paper is based with funding from the United States Agency for International Development (USAID) under a subcontract to the American Institute for Research (AIR). We define *voluntary* teacher attrition as teachers who choose to leave schools and/or the education sector rather than those that leave due to illness, death, or retirement. We define teacher absenteeism as teachers who do not attend work. We acknowledge that the impact of HIV/AIDS on attrition and absenteeism is profound and that many teachers leave teaching because of illness, death, and retirement. However the investigation of the impact of HIV/AIDS on attrition and absenteeism in Zambia is beyond the scope of this study. In this study, we focus, on identifying factors that impact teachers' attendance and/or desire to leave teaching voluntarily.

The task of assessing and analyzing teacher attendance and attrition has been carried out through an examination of government documents and databases on teacher policies in Zambia, as well as via informal interviews with education officials, head teachers, teachers, and other stakeholders. A sample survey on teacher attrition and attendance in Zambia's nine provinces—covering urban and rural teachers as well as classroom and head teachers—also was carried out. The data from this survey allow us to statistically test several models that measure the impact that school, teacher, head teacher, community, and other characteristics have on teachers' risk of leaving their school and of leaving the education sector.

The survey data indicate that 38.6% of all teachers surveyed had considered leaving the current school in which they were employed and that 35.2% had considered leaving the education sector. The regression results for the models of the risk of leaving the education sector *and* for the risk of leaving the teacher's current school both suggest that there are strong relationships between several candidate explanatory variables and both measures of attrition risk.

For all sampled teachers, the following variables are associated with a higher risk of leaving the education sector:

- being married or cohabitating
- being more dissatisfied with school administration and management
- commuting from or living an increased distance from the nearest education office to the school
- teaching in a larger school (as measured by total enrollment).

When we consider important subsamples of our population, additional policy-relevant tendencies emerge:

- When considering only classroom teachers, we find that increased dissatisfaction with the head teacher is an important factor in increasing attrition risk.
- When considering only head teachers, having had specific school management training significantly decreases the risk.

The results for analysis of teacher's risk of leaving their current school are, by and large, quite similar. The following variables are associated with a higher risk of leaving the school where the teacher is currently employed:

- being married or cohabitating
- being more dissatisfied with the administration and management of their school
- being more dissatisfied with student behavior and performance
- commuting from or living an increased distance from the nearest education office to their school.

When we consider subsamples of our population, there are additional interesting and policy-relevant findings:

- For male teachers, having additional employment significantly increases the risk of attrition.
- For female classroom teachers, being a science and/or mathematics teacher significantly increases the risk of attrition.
- For all classroom teachers (and for the urban and female subgroups of classroom teachers), dissatisfaction with the head teacher significantly increases the risk of attrition.
- For head teachers, having had specific school management training significantly decreases the risk of attrition from the school where the teacher is currently employed. This effect exists for all head teacher subgroups.

With regard to the head teacher management training, additional analysis reveals that respondents are more frequently satisfied with school management and administration when the head teacher has had specific training in school administration and management.

With regard to absenteeism, our analysis reveals an absenteeism rate of 17.6%. Our findings show that the incidence of absenteeism is higher in urban (24.1%) than in rural schools (16.6%). Small schools report lower mean absenteeism than large schools, and more smaller schools fall into the categories of no and lower absenteeism than large schools. Schools with student teacher ratios under 30:1 report lower mean absenteeism, and a smaller percentage of them report high absenteeism than schools with student-teacher ratios of between 30:1 and 60:1. Interestingly, schools with exceptionally high student-teacher ratios of over 60:1 have low average absenteeism. Surprisingly, the results do not support the idea that distance from the seat of administration impacts attendance: Schools within 1 hour's walk of the District Education Office have a higher percentage of teachers not present/on time than more remote schools, and more of them fall into the category of Medium/High Absenteeism than schools farther away.

Conclusions

Based on these results and our understanding of the management regulations/structures existing in the primary education system in Zambia, some preliminary recommendations emerge. Further research and dialogue with Ministry of Education officials, teacher and parent representatives, and other stakeholders is needed to fully investigate and formulate these policy recommendations.

Attrition

Given that attrition risk was found to be lower in schools where head teachers had received management training, additional training for head teachers in school management and administration should be investigated as a relatively powerful and cost-effective means of reducing attrition risk for both head teachers and for classroom teachers.

Facilitating communication/interaction between schools and the District Education Office (DEO) might help lower attrition risk among teachers whose schools are located far from DEO offices.

Given the higher attrition risk for married teachers, Zambia may need to investigate a more flexible posting system—one that would allow teachers to remain with their families—could perhaps work to lessen attrition.

Absenteeism

The current management policy allows a significant amount of teacher absenteeism with little or no disciplinary repercussions for teachers. Such policies do little to discourage absenteeism and policies that more closely link teacher attendance and performance to salary should be examined. Closer ties between the community and teachers should also be examined as a means to render teachers more accountable to the community and, hopefully, reduce the incidence of absenteeism.

HIV/AIDS

Given the magnitude of the impact of HIV/AIDS on absenteeism and attrition, the findings from this study should also be viewed within the context of the disease. Though the analysis of HIV/AIDS was beyond the purview of this focused study, further research into the specific impact that HIV has on the education sector certainly needs to be investigated.

1 Introduction

Zambia is in the midst of several crises that are acting in concert to restrain its development. The near-collapse of the copper industry, historically the backbone of the Zambian economy, has been combined with high debt-servicing fees and an underdeveloped agricultural sector that has weathered droughts over the past 10 years. As a result, Zambians find themselves immersed in poverty. Nearly three-quarters of the population live below the poverty line (World Bank, 2002c) and 2.3 million—nearly one Zambian in four—need food aid (International Food Policy Research Institute, 2003). This situation is compounded by the devastating HIV/AIDS pandemic that has lowered average life expectancy by over 20 years and will continue to affect the population for the foreseeable future.

Zambia looks to the improvement and development of its education sector as a key mechanism for poverty reduction and national development. Beginning with basic education, Zambia, with the support of the donor community, is redoubling its efforts to create an education system that provides a high-quality basic education for all, that produces a literate, skilled population. Furthermore, education is included in a cross-sector strategy to combat the HIV/AIDS crisis.

As Zambia plans its education system in order to achieve national and international goals during the coming decade and beyond, the issues of education supply and demand become increasingly important. Growing population and ambitious system capacity goals combine with limited material and human resources to create challenges to the system. Nowhere is this more evident than when examining the supply, demand, and management of trained teachers. Presently, large numbers of trained teachers are exiting the system seemingly faster than they can be replaced, and the recruitment, training, and deployment processes themselves represent a daunting challenge. Ensuring that teachers remain in the teaching corps and in the classroom stretches the management capacity of most education systems, and is made all the more difficult in Zambia by the degree to which illness and death contribute to the challenge.

In this study we investigate factors associated with the risk of voluntary teacher attrition. Although the impact of HIV/AIDS is profound, as this study examines *voluntary* attrition, it is beyond the purview of this study to address issues related to death and AIDS. Similarly, we exclude those teachers who are required to retire given their age. We do, however, attempt to understand what causes teachers to choose to leave the education system—that is, to resign, retire early, or leave for unknown reasons.

The task of assessing and analyzing teacher attendance and attrition has been carried out through an examination of governmental documents and databases on teacher policies in Zambia, as well as via informal interviews with education officials, head teachers, teachers, and other stakeholders. A survey on teacher attrition and attendance in the nine Zambian Provinces—covering urban and rural teachers as well as classroom and head teachers—allows us to test two statistical models that measure the impact that school and teacher characteristics have on teachers' risk of leaving their school and of leaving the education sector.

We also briefly examine absenteeism. Our study focuses on the impact of absenteeism on schools, and the school characteristics that are more closely associated with its occurrence.

In Section 2 we provide information related to the overall development and education sector contexts for Zambia. In Section 3 we briefly examine the education sector with particular emphasis on teachers. In Section 4 we describe attrition and absenteeism in Zambia as well as a brief summary of the attrition literature. In Section 5 we describe our survey methodology and model design as well as principal findings. In Section 6 we provide recommendations regarding possible policy implications and suggestions for further research.

2 Zambia Development Context

2.1 People

Zambia's 10.6 million people are highly urbanized by African standards, with a few large population centers located along transportation axes accounting for approximately 40% of all Zambians (U.S. Department of State, 2002). The remaining population is spread out over an area the size of Texas, resulting in large swaths of under-populated areas and giving Zambia an extremely varied population density.

Zambia's population is relatively young, with one-third of all Zambians being of school age and nearly half under 15 years old (Hurskainen, 2002). Quality of life is poor, with infant mortality having risen to 122 per 1,000 (Save the Children 2003) and life expectancy having declined from a peak in 1980 of 50.5 to its current level of 35.3 (USAID, 2003a). Much of this can be attributed to HIV/AIDS (see below), but that disease is certainly not the only illness that affects the population. Malaria is the leading cause of death in children under age 5 (Save the Children, 2003), and malnourishment, hunger, parasites, anemia, and vitamin A deficiency are rampant among school children (World Bank, 1999). Zambia's orphan population is rising at an astronomical rate, with some models indicating over 900,000 children under 15 years old, or 19% of the age group, having lost a mother or both parents in 2010 (World Bank, 2000a). Though Zambia's total fertility has declined in recent years, 2001/2002 DHS data still reports it as one of the highest in the world, at 5.9, with half of all women having given birth to a child before their 18th birthday. (Central Statistical Office, 2003). Table 1 shows the trend in key health indicators over the past 20 years.

Table 1. Health Indicators

	1980-83	1990-93	1994-96	1997-00
Life expectancy at birth (years)	51	49	46	38
Infant mortality rate (per 1,000 births)	90	79	109	114
Under-5 mortality rate (per 1,000 births)	149	120	n.a.	187
Immunization coverage (% at 12 mos.)	n.a.	75	n.a.	58
Stunted for under 5 (%)	n.a.	41	48	50
Adult HIV/AIDS prevalence (%)	n.a.	17.5	19.9	20.0
Access to improved water source (%)	n.a.	52	n.a.	64
Access to improved sanitation facilities (%)	n.a.	63	n.a.	78

Source: Zambia Country Assistance Evaluation, World Bank 2002.

2.2 Workforce

Zambia's workforce of 4.4 million is largely rural, mostly engaged in the informal sector, and predominantly subsistence farmers. Fifteen percent of Zambians are unemployed, with the under-25 population accounting for three-quarters of the jobless. Available data indicate almost no difference in employment status based on education level, perhaps due to the fact that most of the unemployed are young, and younger Zambians have had more opportunities for education than the previous generation (Fluitman and Alberts, 2000). Nearly all, 88.5%, of those employed are part of the informal economy (Ministry of Finance and Economic Development, Economic Report 1998, cited by Jacaranda Consulting, 2003). The informal economy's share of overall employment has grown in recent years, and this may be attributed to the decline and restructuring of mining and manufacturing sectors, among others. Most Zambians are self-employed or unpaid family workers, with the majority of those engaged in the formal economy living in urban centers (Fluitman and Alberts, 2000). Informal sector agriculture makes up nearly 70% of total employment (Jacaranda Consulting, 2003). The public sector currently accounts for 44% of

formal employment (U.S. Department of State, 2002). The formal sector is better educated than the informal sector, with two-thirds of formal sector employees reaching secondary school, while most in the informal sector exit the system by grade 7 (World Bank Development Database, 2003). Table 2 gives additional details of the workforce.

Table 2. Employment Structure (1998)

	Number	% of Total Labour Force	% of Total Employed	% of Total Informal Sector Employed
Size of labour force	4,712,500	100.0%		
Unemployed	681,500	14.5%		
Total employed	4,032,000	85.5%	100.0%	
<i>of which</i>				
Formal sector employment	465,000	10.0%	11.5%	
Informal sector employment	3,566,000	75.5%	88.5%	100.0%
<i>of which</i>				
Informal sector agriculture	2,807,000	59.6%	69.6%	79.0%
Informal sector non-agriculture	795,000	16.9%	19.7%	21.0%

Source: Ministry of Finance and Economic Development, *Economic Report 1998:24*.

2.3 Economy

Zambia's economy has historically been driven by copper mining and is still depends on it to a large extent. In 1996, mining accounted for 11% of Zambia's GDP and 75% of its total exports, and 15% of all wage employment (Bollinger and Stover, 1999). Profits from this sector have declined over the past 25 years due largely to decreased output and a worldwide drop in copper prices, which tumbled by 65% in the 1970s and have yet to rebound (World Bank, 2002d). Zambia's economy, which was until recently not diversified, has suffered because of this change in the world market. The Zambian government, therefore, began to pursue financial assistance from international donors in the 1980s. The impact of this period is still felt, with Zambia facing \$7.2 billion in external debt in 2001 (USAID, 2003b).

In an attempt to increase profits, recent governments of the Third Republic—1991 to present—have undertaken privatization campaigns of many of Zambia's key sectors including mining, which had previously been inefficient and mismanaged. The initial result of this transition has been continued uncertainty around the sector, which has limited investment and has contributed to decreased output.

Zambia's GDP per capita declined on average by 5% annually from 1974 to 1990 (Jubilee Research, 2003), with GDP at \$3.6 billion in 2002 (World Bank, 2002c). The \$320 in GNI per capita recorded in 2001 (World Bank, 2002c) is barely half of 1975's level of \$590 (Das et al., 2003) and well below sub-Saharan Africa's average of \$470 (World Bank, 2002c).

2.4 Poverty

Poverty is pervasive in Zambia and is compounded by its depth. Extremely poor people outnumber the moderately poor by a margin of 4:1 (World Bank, 2002d), and many Zambians—54% in 1996—are living below the poverty line. This figure masks differences between rural and urban Zambians: 70% of the rural population lives below the line as compared to 28% in the urban areas (World Bank, 1996). This overall figure rose to 73% in 2002 (World Bank, 2002c).

As a result of this poverty, basic necessities represent a large proportion of total expenditures. In 1996, the mean per-capita expenditure per month was 24,000 Kwacha—approximately \$20—with the urban average at 37,000 and the rural average at 17,000. Nationwide, food represented

an average of 64% of household expenditures, and the figure was higher in rural households (68%) than urban ones (56%) (World Bank, 1996). Table 3 depicts the severity of poverty in Zambia and sheds light on disparities between urban and rural Zambians.

Table 3. Overall and Extreme Poverty in Zambia, in Rural and Urban areas, 1991-1998

Year	Zambia		Rural		Urban	
	Overall Poverty (%)	Extreme Poverty (%)	Overall Poverty (%)	Extreme Poverty (%)	Overall Poverty (%)	Extreme Poverty (%)
1991	69.7	58.2	88.0	80.6	48.6	32.3
1993	73.8	60.6	92.2	83.5	44.9	24.4
1996	69.2	53.2	82.8	68.4	46.0	27.3
1998	72.9	57.9	83.1	70.9	56.0	36.2

Source: Zambia Country Assistance Evaluation, World Bank 2002.

2.5 HIV/AIDS

HIV/AIDS impacts every facet of Zambian life and has a crippling effect on the nation's development. The current prevalence rate is estimated at 21.5% (USAID, 2003a) and, though this rate is likely to decline in the future, some models indicate as many as 1.2 million people infected in 2010, due to the increasing population size (World Bank, 2000). Life expectancy has declined from 50.5 in 1980 to its current level of 35.3 (USAID, 2003a), due in large part to the epidemic, and HIV/AIDS has undoubtedly contributed to Zambia's infant mortality rate of 122 per 1,000 (Save the Children, 2003), one of the highest in the world. Data show that 1.7% of the Zambian 15-49 age population dies annually from AIDS (World Bank, 2002b). Another product of the crisis is an alarming increase in the number of orphans in Zambia. Current estimates put the number of orphans under 15 years old at between 360,000 and 620,000¹ (World Bank, 1999, Hurskainen, 2002), and this figure may rise to over 900,000 by 2010 (World Bank, 2000a).

¹ Definitions of orphan vary, and may include children who have lost both parents as well as those who have lost their mothers (often referred to as maternal orphans).

3 Education Context

Zambia continues to struggle to meet its commitment to Education for All and Poverty Reduction Strategy pledges, despite a concerted effort on its part to increase enrollment and improve quality. The Ministry of Education has largely been limited by infrastructure and personnel constraints, compounded by a primary school-aged population that is expected to continue growing through 2010 (World Bank, 2000). The Basic Education Subsector Investment Programme, part of Zambia's PRSP, is currently in its second phase and seeks to increase enrollment, efficiency, and achievement by realizing several goals summarized in Table 4. The contributions to BESSIP from all its international partners represent 27% of all education expenditure in Zambia (Republic of Zambia Ministry of Education, 2002b).

Table 4. BESSIP Goals

• Expand basic education to 9 years by changing the 7-5-4 system to 9-3-4
• Increase GER to 100% by 2005
• Increase NER to 90% by 2005
• Decrease primary dropout rate to 2.5% by 2004
• Decrease repetition rate to 3% by 2004
• Increase primary completion rate to 84% by 2004
• Increase upper basic GER to 50% by 2004
• Increase high school GER to 50% by 2004
• Add 15,000 trained teachers by 2005
• Achieve and maintain a national pupil-teacher ratio of 35:1
• Reduce teacher attrition from 9% to 5% annually by ceasing additional postings to urban areas, establishing a higher starting salary for rural teachers, facilitating teachers' purchase of homes, decentralizing the payroll, and increasing in-service training
• Phase out the use of untrained teachers by 2002
• Create new in-service training
• Establish a student-textbook ratio of 1:2 in grades 1 to 7
• Reinforce equity in education
• Create a school policy on health and nutrition with corresponding interventions
• Build 6,000 new classrooms by 2005, with 3,763 of them built between 1999 and 2002
• Provide seating capacity for all children by 2002.
• Rehabilitate 3,000 new classrooms by 2005
• Build 2,000 teacher houses in rural locations
• Review and overhaul the curriculum to focus on literacy, numeracy, life skills, and HIV/AIDS
• Increase the share of the government's budget to the MOE to 20.5% in 2002, eventually to 25%
• Maintain 60% of the education budget allocation to primary education

Source: World Bank 1999.

3.1 Access, Efficiency, and Achievement

Table 5 highlights the fact that both gross and net enrollment rates have declined over the past 10 years, to 78.2 and 65.5, respectively in 2000, despite an increase in total enrollment of nearly 9%

during the same period² (World Bank Development Database, 2003). These figures highlight the government's struggle to keep pace with a rising demand for education that the 3.2% annual population growth rate has created (Fluitman and Alberts, 2000).

Table 5. Intake and Enrollment Rates and Pupil-Teacher Ratio

	1980			1985			1990			1995			2000		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
GER, primary	82.5	97.5	89.9	98.0	111.2	104.5	95.0	102.4	98.7	85.6	91.4	88.5	76.0	80.3	78.2
GER, secondary	10.8	21.8	16.1	14.0	25.2	19.5	18.2	30.1	24.1	20.3	32.6	26.5	21.1	25.9	23.5
GER, tertiary	0.6	2.4	1.5	0.6	3.6	2.1	1.3	3.4	2.3	1.4	3.6	2.5	1.6	3.4	2.5
NER, primary level	72.8	81.2	76.9							73.9	75.6	74.8	65.2	65.8	65.5
NER, secondary													17.7	20.5	19.1
Net intake rate to grade 1													39.7	36.7	38.2
Gross intake rate to grade 1													81.6	79.9	80.7³
Pupil-teacher ratio, primary			48.6			49.4			44.0			39.1			45⁴

Source: World Bank DevData 2003

Those students who do enroll find themselves in an inefficient system that often fails to provide a quality education. A 1996 survey found only 25% of grade 6 students achieved the minimum level of reading skill deemed necessary, and only 2.4% had achieved a “desirable” level (UNESCO, 2000). In 1999, grade 5 students tested in Reading and Mathematics scored 33.2 and 34.3, respectively, on a scale from 0 to 100 (Zambia Ministry of Education, 2002b). Efficiency trends worsened during the 1990s, a decade that witnessed decreasing retention and completion and rising repetition rates. In 2001, the national repetition rate was 6.5%, ranging from 4% in grade 2 to 15% in grade 7, and the dropout rate was 3.8% (Zambia Ministry of Education, 2002b). Preliminary EMIS data for 2002 show little change—a repetition rate of 7.7% and a dropout rate of 3.6%⁵. In 2000, it took 9.9 years of resources to produce each graduate from the 7-year primary cycle (Oxford Policy Management, 2002). As highlighted in Table 7, repetition rates are slightly higher for males than females. Conversely, primary completion rates are higher for males (see Table 6).

² These nation-level figures mask inequality that exists between provinces. For example, 2000 GER varied from 73% to 94%.

³ 1999 data.

⁴ 1998 data.

⁵ These repetition rates are below the 2000 levels in Uganda (9.7%), Namibia (13.2%), and Malawi. (15.4%).

Table 6. Retention, Completion, and Repetition Rates

	1995			2000		
	Female	Male	Total	Female	Male	Total
School life expectancy (years)	7.2	8.3	7.8 ⁶	6.6	7.3	6.9
Primary completion rate, total	75.4	89.8	82.7			67 ⁷
Primary repetition			2.8			6.2

Source: World Bank DevData

Table 7. Repetition Rates By Grade, 1999/2000 and 2002

Grade	1999/2000			2002		
	Female	Male	Total	Female	Male	Total
1	4.1	4.4	4.3	5.2	5.3	5.2
2	4.3	4.4	4.3	5.8	6.1	6.0
3	4.3	4.5	4.4	6.1	6.7	6.4
4	5.6	5.8	5.7	7.2	7.8	7.5
5	5.4	5.8	5.6	7.0	7.6	7.3
6	7.2	7.4	7.3	8.0	9.1	8.6
7				13.0	16.1	14.7
8				4.5	4.9	4.7
9				14.6	14.7	14.6

Source: EFA Global Monitoring Report 2002, Zambia Preliminary 2002 EMIS Data.

Possible factors that may contribute to this low internal efficiency include limited instruction time of 3.5 hours per day, multishift schools and multigrade classrooms, teacher and student absenteeism, inadequate facilities and resources, and outdated curriculum.

3.2 Finance

From 1997 to 2000, funding for total education declined in real terms, as a percentage of total government expenditure, and as a percentage of GDP (Oxford Policy Management, 2002). Education received 19% of the total Zambian public budget in 1999 (World Bank, 1999). In 1998, education accounted for 2.3% of Zambia's GDP (World Bank Development Database, 2003) and 2.1% in 2000 (Zambia Ministry of Education, 2002b). These funding levels were lower than most in sub-Saharan Africa, with only Madagascar, Sierra Leone, Chad, Guinea, Central African Republic, and Tanzania reporting education accounting for a lower share of GDP in 1998 (UNESCO Institute for Statistics 2003).

Per-pupil expenditure has dropped from 9.8% of GDP per capita in 1980 to 4.7% in 1997 (World Bank, 2002a), and in 2000, per-pupil government expenditure for grades 1-7 was \$25.80 (Zambia Ministry of Education, 2002b). In 1996, expenditure per secondary pupil was 2.3 times that per primary, and expenditure per tertiary was 127 times that per primary (World Bank, 1999). Teacher salaries account for most of the government's education expenditure; they made up approximately 65% of the total budget from 1997 to 2002, and 78% of the total in grades 1-7 in 2000 (Zambia Ministry of Education, 2002b). After a significant increase in salary and allowances in 2001, the figure rose to 91%.

Zambia is committed to raising the level of funding for education as a percentage of the national budget, and plans to continue to allocate 60% of the education budget to the basic education

⁶ 1994 data.

⁷ Data from "Unit Cost Study of Education in Zambia." Oxford Policy Management.

subsector (World Bank, 1999); however, in 2000, basic education received 56% of education expenditures (Zambia Ministry of Education, 2002b). The government also plans to increase spending on education as a percentage of GDP (Oxford Policy Management, 2002).

3.3 Equity Between Urban And Rural Schools

While rural postings may not be desirable, the expansion of education in rural areas has increased the demand for teachers. Recently, the MOE embarked on a massive reform in teacher deployment, including the development of teacher deployment guidelines, with emphasis on the needs of rural areas.

Zambia's education system favors urban students over rural ones on a number of levels. In 1998 in urban schools the average pupil teacher ratio was about 39, and in rural areas the average pupil teacher ratio was 48 (UNESCO, 1998 data). In 2002 these figures were 31.2 and 59.2 for urban and rural schools, respectively, (preliminary 2002 EMIS data), suggesting that rural school enrollment has grown at a rate greater than the Ministry's ability to staff the schools. Almost all (95%) of Zambia's untrained teachers, in fact, are found in rural schools⁸. There is a much higher concentration of teacher trainees and volunteers in rural schools (as high as 1 teacher in 5, as opposed to 1 in 10 in urban schools (World Bank ESDS). Rural teachers are less experienced, with one teacher in three having less than 2 years of experience and two teachers in five having been at their current school for less than 2 years (World Bank ESDS). Urban teachers earn higher salaries than do rural teachers, reflecting these higher training levels as well as more years of experience. There are half as many female teachers in rural schools than in urban schools. (UNESCO, 2000). All of these factors reflect the fact that rural postings are considered less desirable (especially for women) and, accordingly, the government has difficulty staffing them.

Staffing rural posts is difficult because of the many challenges that teachers face. Rural teachers have little pedagogic support and have difficult access to hospitals. Because rural schools are farther from the local district education office, there may be diminished opportunities for professional growth due to lack of contact with those in a position to evaluate performance. In addition, there is a general acknowledgement that women are reluctant to accept rural postings. Single women are reluctant to take rural postings because of the poor prospects for finding a husband in rural towns, and married women are unwilling to relocate at the expense of their husbands' jobs. One source cites women obtaining false marriage certificates to more easily justify urban postings (UNESCO, 2000).

Funding is another area of great difference between urban and rural schools, both publicly and privately. On the public side, per-pupil government funding is 47% higher in urban schools than in rural ones, representing the difference in staff allocations, rule-based funds (allocated on a per-school basis, regardless of enrollment), and discretionary funds per pupil (Das et al., 2003).⁹ On the private side, as the government looks to family contributions to assist in the increase of quantity and quality of education, differences between urban and rural conditions become more important. In the World Bank's 2002 EDSD survey¹⁰, private contributions (per-pupil) were nearly twice as much for urban pupils as those for rural ones (Das et al., 2003). Compounding this inequity between urban and rural sectors is the inequity between the haves and the have-nots: a 1993 survey found that while the \$24 rural households spent per child was higher than the \$21

⁸ The government planned to phase out all untrained teachers by 2002 as part of BESSIP.

⁹ For a detailed explanation of Zambia's education financing, see Das et al. A summary is presented in the appendix in Table A2.

¹⁰ All but five of the 184 ESDS-sample schools are public, and are drawn from Lusaka, Copperbelt, Northern, and Eastern Provinces.

that low-income urban households spent, it paled in comparison to the \$144 that high-income urban households provided (Hurskainen, 2002). In addition to the benefits of supplemental household-supplied resources, the 2002 EDSD survey indicates that schools with pupils from high-income households benefit from lower average class sizes of 39 than their low-income counterparts' class size of 64 (Das et al., 2003). Tables 8 and 9 show differences in educational inputs between urban and rural schools.

Table 8. Urbanization, Wealth, Location, Salary, and Class Size (2002)

Urbanization, Wealth, and Distance	Average Teacher Salary (K/Month)	Average Class Size
Schools with pupils from low-income households	212,135	64
Schools with pupils from middle-income households	235,606	60
Schools with pupils from high-income households	277,750	39
Schools that are urban	270,107	43
Schools that are rural	228,195	61
Schools that are less than 5 km from district office	273,929	41
Schools that are more than 5 km from district office	228,823	60
Schools that are less than 5 km from provincial office	286,344	41
Schools that are more than 5 km from provincial office	235,976	56

Source: ESDS Data, cited in World Bank's *Rules vs. Discretion: Public and Private Funding in Zambian Basic Education – Part I: Funding Equity*.

Table 9. Urbanization, Wealth, Location, and Public and Private Funding (2002)

Urbanization, Wealth, and Distance	Public Funding (Rule-based, Discretionary and Staff Allocations) K per Pupil	Private Funding (PTA, Registration, Sports and Other Fees) K per Pupil
Schools with pupils from poorer households	13862.83	1371.33
Schools with pupils from richer households	16918.55	3102.22
Schools that are urban	19473.16	3201.89
Schools that are rural	13203.38	1719.87
Schools that are less than 5 km from district office	21265.87	2473.91
Schools that are more than 5 km from district office	13018.46	2134.44
Schools that are less than 5 km from provincial office	10424.05	3337.80
Schools that are more than 5 km from provincial office	16038.40	2085.21

Source: ESDS Data, cited in World Bank's *Rules vs. Discretion: Public and Private Funding in Zambian Basic Education – Part I: Funding Equity*.

3.4 Teachers

Currently, five different types of professionals teach in Zambian schools. Trained teachers who hold a university or college degree, trained teachers who hold a primary diploma, untrained teachers, government-sponsored ZATEC (Zambian Teacher Education Course) student teachers, and privately-funded student teachers make up the 40,488 teachers working in the system in Zambia's 9-year Basic Education system 2002.

- There were 37,161 trained teachers in 2002 (preliminary Zambia 2002 EMIS), representing 92% of all teachers. These are divided into:
 - University and college-trained teachers, who are individuals teaching in schools who have completed teacher training college or university-level courses.

- Primary diploma teachers, who are individuals teaching in schools who have completed grade 12 and received a School Certificate or G.C.E “O” levels with at least 3 credits and 2 passes including English Language and Mathematics Teacher Training and Qualification.
- Government-sponsored and privately funded student teachers are individuals enrolled in the Teacher Training College programs during the school-based part of their teaching training program.

Untrained teachers are individuals teaching in schools who do not have any type of teacher training. Table 11 shows the breakdown of teachers by gender, training, and province. Nearly 90% of Zambian teachers in 1998 were trained¹¹, although this figure varies from province to province, ranging from 97.3% to 80.4%, and is much higher in urban areas (98.8%) than in rural ones (84.2%). As previously stated, 95% of Zambia’s untrained teachers are found in rural schools. A higher portion of female teachers are trained (92.5%) than are male teachers (87.5%) (UNESCO, 2000).

Table 10. Distribution of Primary School Teachers by Province, Gender, and Training Status (1998)

ProvincesAreas	Number of Teachers					
	Trained			Untrained		
	Male	Female	Total	Male	Female	Total
Copperbelt	2,288	4,264	6,652	119	68	187
Central	1,997	1,682	3,679	224	170	394
Lusaka	1,973	3,794	5,767	47	16	63
Southern	1,763	1,732	3,495	297	151	448
Luapula	1,546	701	2,246	186	112	298
Northern	1,978	1,058	3,036	503	235	738
Eastern	1,963	1,141	3,104	331	248	579
Northwestern	994	410	1,404	215	105	320
Western	1,439	1,099	2,538	362	178	540
Zambia Total	15,941	15,880	31,821	2,284	1,283	3,567
Rural	11,962	6,254	18,216	2,202	1,206	3,406
Urban	3,979	9,626	13,605	83	78	161

Source: 1998 UNESCO Country Report.

¹¹ According to preliminary EMIS data from Zambia, in 2002 the percentage of trained teachers had increased to 91.8% .

Table 10a. Distribution of Primary School Teachers by Province, Gender, and Training Status (1998)

Provinces/Areas	Percent of Teachers					
	Trained			Untrained		
	Male	Female	Total	Male	Female	Total
Copperbelt	95.1%	98.4%	97.3%	4.9%	1.6%	2.7%
Central	89.9%	90.8%	90.3%	10.1%	9.2%	9.7%
Lusaka	97.7%	99.6%	98.9%	2.3%	0.4%	1.1%
Southern	85.6%	92.0%	88.6%	14.4%	8.0%	11.4%
Luapula	89.3%	86.2%	88.3%	10.7%	13.8%	11.7%
Northern	79.7%	81.8%	80.4%	20.3%	18.2%	19.6%
Eastern	85.6%	82.1%	84.3%	14.4%	17.9%	15.7%
Northwestern	82.2%	79.6%	81.4%	17.8%	20.4%	18.6%
Western	79.9%	86.1%	82.5%	20.1%	13.9%	17.5%
Zambia Total	87.5%	92.5%	89.9%	12.5%	7.5%	10.1%
Rural	84.5%	83.8%	84.2%	15.5%	16.2%	15.8%
Urban	98.0%	99.2%	98.8%	2.0%	0.8%	1.2%

Author calculations

Despite this high level of training, compared to Namibia's 29%, Uganda's 45%, and Malawi's 53% (UNESCO UIS, 2003), Zambian teachers in general are poorly paid, earning only 2.4 times the GDP per capita on average in 1999 (World Bank, 1999) and 4.4 times GDP per capita in 2001 (Oxford Policy Management, 2001). This salary is less than the stipend university students receive, and puts them among the lowest paid teachers in sub-Saharan Africa (World Bank, 1999). Zambian teachers do, however, receive allowances on top of their salaries. These allowances compensate teachers for a range of activities, from teaching a double load (in a split-shift school) to working in a rural location (hardship and housing allowances).

Because of a shortage in the number of available teachers and the desire to raise intake and enrollment rates, most teachers in grades 1-4 are assigned two classes, resulting in a total number of just 3.5 instructional hours per class per day. Thus, even though the primary student-teacher ratio in 2002 was 46:1, the students-class ratio was 36.6:1 due to the double-shift strategy (Oxford Policy Management, 2002, 2002 preliminary EMIS data). While enabling more students to participate in education and lowering class size, this practice likely has an impact on the amount of learning actually taking place, and it puts additional strain on teachers, who may already be working with little motivation, by requiring them to teach 7 hours per day.

4 Teacher Management

Zambia's education sector goals focus on increasing the quality and quantity of basic education, and teachers play a lead role in this challenge. As education expands and as the demands on teachers increase, the teacher management process will become increasingly important to the development of education sector.

4.1 The Teaching Service Commission

Chapter 135 of Volume 10 of the Laws of Zambia details the teaching service in Zambia, the structure of the teaching profession, as well as the rules and regulations governing administration of teacher (rights, benefits, discipline, etc.).

According to the text of the law, the Ministry of Education is to be advised on matters related to the management of teachers by the Teaching Service Commission (TSC), which is comprised of a Chairman and "not more than two other members." The TSC's specific responsibilities are:

- (a) recruitment and selection procedures for employees in Divisions I and II (trained teachers)
- (b) appointments, including promotions and acting appointments for periods of more than 3 months, in Divisions I and II (trained teachers)
- (c) confirmation in appointment of employees
- (d) extension and termination of probationary appointments
- (e) renewal and termination of contracts and agreements of employees
- (f) retirement before the normal age of retirement
- (g) any disciplinary matters referred to it in accordance with the provisions of these Regulations and any other disciplinary matters which may be referred to it by the Secretary
- (h) any other matters affecting the Service which the Secretary may refer to the Teaching Service Commission for advice. (Republic of Zambia, 1995).

The TSC's tasks are facilitated by regional TSCs, made up of the Chief Education Officer and between two and four persons per region/province. These regional TSCs have responsibility for recruiting and appointing untrained teachers, as needed, and informing the national TSC on matters concerning regionally appointed personnel. Though the TSC may advise the MOE on such matters, responsibility for confirming teachers, promoting them, disciplining them, etc. remains the responsibility of the MOE (Republic of Zambia, 1995).

4.2 Teacher Recruitment and Deployment

To be a primary teacher, a grade 12 graduate has to attend a 2-year Teacher Training College (TTC), after which he/she will receive a Primary Teacher Certificate. Students about to graduate from TTCs should be notified by principals of their colleges about vacancies in schools. This information is supplied to principals by the PEOs and DEOs. In addition, DEOs are supposed to visit TTCs to advertise positions in their districts. It is the responsibility of the Teacher Education Department to convey this information to students at the University of Zambia (UNZA), COSETCO, and Nkrumah TC. From 2 to 3 months before the conclusion of the course, prospective teachers apply to the Teaching Service for a teaching job by completing an application at the same Teacher Training College where he/she studies or at the District

Education Office (DEO) closest to the school where they want to teach. These prospective teachers are eligible to start teaching only after they receive confirmation of passing from the Examination Counsel, and after they receive their Primary Teacher Certificate.

After the applications are received, the DEOs, in collaboration with the Teacher Education Department, make the final selection and deployment of teachers to schools. After deployment, DEOs are supposed to report excess applicants to PEOs in order to facilitate staffing needs being addressed through redeployment.

Deployment of teachers should be based on a number of criteria, including (in order):

- availability of vacant posts—no teacher shall be deployed unless a vacancy exists
- availability of accommodations
- gender representation—especially important for females in rural areas
- return from leave—when a teacher returns from extended leave he or she shall be redeployed if a vacancy does not exist in their original school
- personal reasons—teachers may request particular posts
- medical grounds
- ability to use local languages (Republic of Zambia Ministry of Education, 2001b).

It is important to note that according to the laws of Zambia, a teacher may be posted anywhere in Zambia (Republic of Zambia, 1995). The guidelines go on to state explicitly the outcome for teachers who refuse to take up their assigned posts. “Newly appointed teachers who resist deployment to MOE’s identified schools on marital grounds shall not be employed...Serving officers who resist re-deployment shall be put on unpaid leave, and where necessary disciplinary action shall be taken against them to deter others from doing the same...Any officer who deserts his/her station on unjustified grounds such as witchcraft shall be charged in accordance with the general orders.” (Republic of Zambia Ministry of Education, 2001b).

A probationary period of employment follows initial appointment of the teacher. Probation times vary from 2 to 4 years depending on teacher qualifications. After this period of probation, and based on the recommendations of managers, regional committees and the TSC, the MOE confirms teachers (Republic of Zambia, 1995). Usually, newly hired teachers are posted in schools they applied to, but this is not always true. If teachers are unsatisfied with their posting, no reallocation is possible during the current period. They can request a transfer only after confirmation as a teacher.

Recent interventions to improve teacher recruitment and deployments include raising awareness of DEOs of current management problems and orienting DEOs to undertake frequent visits to teacher training colleges to discuss teacher demand. In addition, the application for teaching posts can now be completed at the college and district level, which may result in a more responsive posting system. Positions are also advertised in both print and electronic media so applicants have complete information about the availability of posts. The MOE-TED has sponsored meetings with DEOs to discuss mechanisms to improve the allocation of teachers in the system through rethinking the allocation of primary school teachers to selected urban areas that are already well staffed.

Linking recruitment with deployment through announcing vacancies in particular schools and including this information in the application process facilitates managing shortages of teachers for particular schools and areas. In addition, it is the first step in identifying difficult deployment areas, where additional incentive packages should be implemented, including housing construction, difficult areas allowance, special school calendar, and so forth, to address the schooling demand.

4.3 Teacher Career Development

The system currently has a career schedule with vertical and horizontal progression schemes; however, the value of the increments is very limited. "Guidelines for Human Resource Deployment and Promotion in the Ministry of Education" (Republic of Zambia Ministry of Education, 2001b) lays out guidelines for promotions, which are to be based on the following criteria:

- **Zambian citizenship**
- **confirmation in appointment**
- **vacancy of posts : promotions may only be made if there is a higher-level vacancy**
- **academic qualifications**
- **experience**
- **competence**
- **conduct**
- **gender balance**

The MOE may grant raises based on annual reports from employees' managers and from regional committees. Similar advice informs the MOE's decisions regarding employee promotion. (However, anecdotal evidence suggests that the linkages between teacher performance, school inspections, and promotions may not be quite as clear as detailed in this plan.) An employee does not have access to his/her record of service, which includes comments and observations by managers, sick leave balance, medical history, and so forth.

Employees may retire at any point after reaching 55 years of age for men and 50 years old for women. Retirement is mandatory for males at age 60 and for females at age 55. Females may be required to retire if they marry (Republic of Zambia, 1995).

4.3.1 Pre-Service Teacher Training

There are two major teacher pre-service training programs, one provided by the two Zambian Universities (University of Zambia and Copperbelt University) and the other administered at Zambia's 14 Teacher Training Colleges (TTC). There are 12 TTCs exclusively dedicated to training teachers for grades 1-7 and another two for upper basic (grades 8-9) and high school (grades 10-12). The Natural Resources Development College also provides teachers for agriculture science.

4.3.1.1 University Program

The University of Zambia's School of Education offers various degree programs: a Bachelor of Arts in Education, a Bachelor of Science in Education, and a Bachelor of Arts in Special Education, all lasting 4 years. It also offers a Bachelor of Education in Primary Education, which lasts 3 years.

According to Zambia's Strategic Plan for 2003-2007, the involvement of University of Zambia in teacher education lacks coordination with national initiatives, despite having initial teacher education for high school teachers (10-12), a Special Education Department, and a degree program in primary education (1-7). A focus for the coming years is the creation of closer links between the University system and the Ministry of Education, in order to ensure that the teachers produced at the University meet the needs of the system (Republic of Zambia Ministry of Education, 2002a).

4.3.1.2 Teacher Training Colleges

There are two types of TTC students: government-sponsored students participating in the Zambian Teacher Education Course (ZATEC) and self-sponsoring students. ZATEC students receive bursaries during the entire program, and pay fees and board at the TTCs. Privately funded students, however, pay for their education and generally do not board at the school.

The TTC curriculum has been drastically revised over the last 3 to 4 years. As a result, all TTCs currently have the same curricula¹². The program is divided in two phases. During the first phase students study full-time at the College, and in the second phase, students are posted in schools teaching part-time and studying part-time, following a distance-learning program with modules and assignments related to the actual teaching.

Generally, District Education Officers supply details of teacher vacancies in the system, while TTC students indicate their assignment preferences at the college where they study. The final decision on posting is made by the TTC director, who considers factors such as if the student has accommodation or lives close to a particular post.

Although the two-phase system was initially designed to ease the transition into teaching, some difficult conditions may make the transition more challenging. For example, student teachers are frequently placed in schools where there are vacancies; often, these schools are located in difficult areas with little support and poor physical and material conditions. In addition, accommodation for student teachers is lacking, with the result that existing teachers sometimes host student teachers. In part to counter some of the challenges faced by new teachers, Resource Centres have been created to provide field support to all teachers.

Another barrier for student teacher transition into the professional life is that there is a mismatch between what student teachers learn at the TTCs and what senior teachers at schools are teaching. This occurs because curriculum reform is quickly incorporated in the TTC program, but implementation of the new curricula at school level takes longer.

4.3.2 In-service Teacher Training

Zambian teachers are entitled to receive in-service teacher training after having been confirmed as teachers, i.e., after their probationary period ends. There are two different in-service training programs: one provided by the National In-Service Teacher College and the other provided at the Resource Centres. In-service teacher training is also provided through distance learning. The Resource Centres are governmental structures created by MOE-TED to provide pedagogic support to schools.

The Ministry, in its Strategic Plan for the coming years, has recognized the need to harmonize its professional development efforts by creating a system of Continuous Professional Development. This system would coordinate Teacher Training Colleges, Teacher Resource Centres, in-service institutions, and UNZA, among others, to provide professional support to teachers, from pre-service training through the length of their careers. For the immediate future, the Ministry has decided to focus on the school- and zone-levels' in-service training opportunities and resources. (Republic of Zambia Ministry of Education, 2002a).

¹² To facilitate the shift to a 9-year basic education cycle, it is the Ministry's intention to revise the curriculum of ZATEC training again to focus on preparing teachers for grades 8 and 9, since the need for teachers is greatest in those grades (Republic of Zambia Ministry of Education 2002b).

4.4 Teacher Remuneration and Benefits

Teachers are the largest group of civil servants in Zambia, outnumbering the next largest group by a margin of 2 to 1. The ES salary scale for teachers is only one of five salary scales for education employees and one of 39 in the Zambian public service system. The ES scale is separate from those for Secondary Education, Technical Education, Technical Education Management, and Education Management employees. The government of Zambia has recognized that this system of pay scales makes lateral movement within the system difficult and results in incongruities in the pay structure, such as less experienced workers earning more than more experienced staff who fall under a different scheme. The government has been advised that it needs to simplify the salary structure of all public servants, and one solution to this issue is to incorporate the pay structures of all employees within a subsector, such as education, into a new universal scheme (Valentine, 2002).

A collective agreement between the Zambia National Union of Teachers (ZNUT) and the Government of the Republic of Zambia set forth the salary schedule for 2001 and 2002, as well as the details of additional allowances teachers are to receive for various conditions of service. The ES scale currently has a total of six grades, each with six steps. Entry points for the various positions in the salary scale include:

- ES2.6: An untrained teacher who is a university graduate
- ES2.5: A trained teacher who is a university graduate
- ES4.6: A non-graduate secondary school teacher with 2 years' training
- ES4.5: A non-graduate secondary school teacher with 3 years' training
- ES5.6: A grade 12 graduate primary school teacher with 2 years' training
- ES6.6: A grade 9/10 graduate primary school teacher with 2 years' training (Republic of Zambia Ministry of Education, 2001a).

In 2001, annual salaries for Zambian teachers ranged from 4,855,740 (ES6.6) to 5,756,496 (ES1.1) (Republic of Zambia, 2002). This initial salary for new teachers is the equivalent of just over \$1,000 using 2003 exchange rates, and is below the poverty line of \$1,380 (Oxford Policy Management, 2002). The complete salary scale can be found in Table A16 in the Appendix. Teachers' annual pay increases are linked to their level of education and years of experience. Pay increases are not linked to teacher performance and occur automatically every year¹³. Assuming an annual increase in step, teachers' annual pay increases are between 0.4% and 0.7%, which does not match the annual inflation rate of 17.5%, effectively giving teachers a negative annual salary change (Republic of Zambia Ministry of Education, 2002b; Das mimeo, 2003).

As noted earlier, Zambian teachers may receive allowances to compensate them for certain conditions of service. These include:

- responsibility allowance: 20% of one's basic salary
- extra duty allowance: 20% of one's basic salary
- rural hardship allowance: 20% of one's basic salary
- special education allowance: 30% of one's basic salary
- recruitment and retention allowance: 20% of one's basic salary (Republic of Zambia Ministry of Education, 2001a).

¹³ Discussions with Mr. Charles Ndakala, Senior Systems Analyst of the Information Section of the Planning and Information Directorate, Headquarters, Zambia Ministry of Education (Fall 2003).

Under the agreement between the government and ZNUT, teachers are entitled to additional benefits as well. These include:

- funeral grants
- meal allowances
- subsistence allowances
- house loans
- household loans
- car loans
- settling-in allowance (Republic of Zambia Ministry of Education, 2001a).

A full-time employee may be granted 180 days of sick leave at full salary and an additional 180 days of sick leave at half salary over the course of 2 years. Sick leave may be granted for short periods of time without a report from a medical expert, but extended absences require proof of illness. Sundays and holidays during periods of leave are considered days with leave, and count against the number of excused or unexcused absences. Teachers are required to inform their managers of their inability to work because of illness, and failure to do so is considered misconduct. An employee may be granted 30 days of leave during the school holidays, which may be carried over from one year to the next. Travel time is permitted to and from the employee's place of work and place of residence, to a maximum of 10 days per year.

In the event of urgent private affairs, employees may be granted leave without pay, at the discretion of the employee's manager. An employee may be granted special leave to attend training/instruction or to sit an exam, during which time the MOE may determine whether or not pay is to be given to the employee (Republic of Zambia, 1995).

4.5.1 The Views of Teacher Professional Organizations

In Zambia, there are three teacher union organizations: the Zambian National Union of Teachers (ZNUT), the Primary Education Teacher Union (PETUZ), and the Secondary Education Teacher Union. Teacher unions have the capacity to mobilize their members and promote strikes as a way to bargain with the government for change.

As recently as May 2003, Zambian teachers have been on strike. While the usual reasons for strikes are low pay and poor working conditions, in Zambia the largest union, ZNUT, is mainly concerned with the lack of support for professional development. This includes lack of a career plan that rewards good teaching and provides minimum guarantees to which any worker should be entitled. While unions agree that teacher wages are low, they are also concerned with the lack of compliance government has shown in keeping teacher payment schedules, facilitating collection of pay, revising career paths, and designing a supportive system that includes allowances and retirement benefits.

Union members have provided some interesting anecdotal evidence on the teacher unions' views. According to these discussions, teachers pay high fees and tuition for training, but when hired the returns are very low. The teacher unions believe there are many graduates who do not pursue a teaching career because of the working conditions and the debt they carry from higher education training. In addition, the unions report that teachers leave the country to pursue teaching careers abroad under better remuneration schemes. According to unions, if the high attrition rate of trained teachers could be reduced or eliminated (and teachers stay in the system), Zambia would have an excess of teachers.

Zambian teacher unions believe that high attrition and low attendance rates are related to difficult working conditions. They cite the fact that some teachers spend roughly half of their pay in

transportation, specifically costs to collect the remuneration at the DEOs, which are often far away from schools. From the unions' perspective, despite the fact that teachers are not teaching when they need to collect their salaries at the DEOs (sometimes it takes 3 days or more), teachers are on duty, and this absence is "official" or "justified." If teachers have to spend 3 days per month traveling to collect their pay, this accounts for roughly 15% of their time at school, which the unions view as the result of the inability of the government to pay its employees for the teaching services provided. This inability is accentuated in rural areas and constitutes an additional incentive for teachers to leave teaching in these areas or refuse posting there. The unions also cite the problem of late payment of teacher wages, sometimes taking from 20 to 60 days.

This problem of pay may be viewed as structural and not necessarily the responsibility of the MOE alone. The financial institutions and the bureaucracy used to transfer and certify resources, as well to guarantee the effective availability of funds, play a role in the issue. However, the unions claim that delays in pay are never justified or explained by the MOE, and there are no signs of the MOE exerting leadership in the process to find solutions for this problem.

The unions also view the training and use of student teachers as problematic. The school-based training that student teachers receive would be much more acceptable if there were a mentoring system (not only distance learning schemes) and if mentoring was not an additional task loaded onto the poorly paid teachers who are already over-burdened. As it stands, the unions believe that instruction alone cannot adequately prepare student teachers. In addition, the experiential learning component of student teachers would have more value and more impact if student teachers were additions to the current staff of schools, rather than to fill teacher vacancies. The union perceives the duration of the pre-service training (1 year in the TTCs and 1 year in the classroom) as too limited, though this opinion may have changed with the recent expansion of pre-service training to 3 years in place of 2.

For the unions, untrained teachers are not an option to fill teacher vacancies. Their proposal to address teacher shortages is to call back retired teachers under contract who have vast experience. However, the government proposal for retired teachers is to incorporate them into the career ladder and salary scheme starting at the lowest scale, the same as a recently graduated teacher. Unions believe that the low wages discourage highly qualified teachers from returning to teaching. They feel that using untrained teachers in the system threatens the quality and standards of the teaching career, which only makes the profession less appealing to potential teachers. The unions' also believe there is a need for an independent Accreditation Board for evaluating and monitoring the quality of the profession. Investments in rescuing and promoting the status of the teaching profession are critical to the improvement of the quality of education.

Another pay-related problem from the unions' perspective is lack of equitable pay for teachers with the same qualifications and experience. They feel that this problem has become more significant in recent years when the lack of explicit criteria for career advancement has made distribution of promotions and allowances inequitable and arbitrary. Decentralization may accentuate this problem if the government does not review the career plans and institute clearer parameters and criteria for promotion and incentives.

4.6 *Teacher Attrition in Zambia*

Increasing levels of enrollment, quality, and efficiency necessitate increasing the capacity of the system to accommodate the school-aged population, while at the same time providing an educational environment conducive to learning. In addition to the pedagogical and material resources this demands (such as classrooms, books, furniture), sufficient numbers of trained teachers are needed to guarantee that advances in quantity are not made at the expense of quality.

Lack of trained teachers is one of the greatest constraints to Zambia's progress in providing education to its population. In addition, changes in the management capacity of the schools and the Ministry of Education (MOE) are needed to accommodate the larger number of teaching staff.

Although a primary pupil ratio of 46:1 does not, on the surface, appear exorbitant, this ratio is misrepresentative; the number of teachers is, in fact, vastly insufficient, due to overstaffing of urban schools and understaffing of rural ones. According to discussions with MOE, remote rural schools are at times staffed by one teacher alone with a resulting student-teacher ratio of 250:1 or more¹⁴. In addition, to lessen the impact of low teacher supply, the MOE relies on double shifts in schools. Thus, even though the primary student-teacher ratio in 2002 was 46:1, the student-class ratio was over 36:1 due to the double-shift strategy employed (Oxford Policy Management, 2002, 2002 Preliminary EMIS data). Though double shifts have allowed schools to accommodate more students, they have also reduced the average class-time per pupil. The World Bank estimates that instructional time per student has been reduced 3.5 hours per day (World Bank, 1999). The MOE has worked to increase the output of teacher training colleges (4,667 trained teachers in 2000), yet the excess demand for teachers remains a problem exacerbated by attrition.

Besides thwarting the MOE efforts to provide an adequate supply of teachers, attrition has also resulted in a young and relatively inexperienced teaching corps. The World Bank's 2002 Expenditure and Service Delivery Survey (ESDS) collected and analyzed data from a pool of teachers in four of Zambia's nine provinces, and the results shed light on attrition, absenteeism, and the correlation between these two factors and student achievement. The study concludes that the high number of inexperienced teachers throughout the system suggests that many teachers are leaving the profession after only 1 or 2 years of service. Attrition appears to be worse in rural areas, and ESDS results show that rural teachers are less experienced than their urban counterparts—one teacher in three has fewer than 2 years of experience, and two teachers in five have been at their current school for fewer than 2 years (World Bank, ESDS Survey 2002).

Though figures on teacher attrition vary from source to source,¹⁵ the PRSP's goal is to reduce teacher attrition from 9% to 5%. Table 13 shows a breakdown of teacher attrition by reason for leaving.

Table 11: Total Number of Teachers Leaving the Profession

Teacher Losses	2000		2001		2002	
	Number	Percent	Number	Percent	Number	Percent
Assigned to non-teaching duties	143	7.1%	23	1.9%	29	2.5%
Contract expired	653	32.3%	141	11.8%	108	9.3%
Resigned	132	6.5%	88	7.3%	115	9.9%
Dismissed	61	3.0%	41	3.4%	37	3.2%
Retired	308	15.2%	233	19.4%	297	25.5%
Died	581	28.7%	485	40.5%	457	39.2%
Others	145	7.2%	154	12.8%	40	3.4%
Unknown	0	0.0%	34	2.8%	82	7.0%
Total	2,023	100%	1,199	100%	1,165	100%

Source: Zambia EMIS.

¹⁴ Discussion with George Caldwell – EMIS Consultant at the MOE.

¹⁵ This discrepancy may be due to a number of reasons including initial data source and the definition of attrition.

The leading cause of attrition (39.2%) in 2002 is death. There can be little doubt that AIDS is the major contributor to this large figure. Ministry of Education estimates that HIV/AIDS claims 2.5% of the teacher population every year (Zambia Ministry of Education, 2002b)¹⁶. Other sources cite total deaths of 680 in 1996, 624 in 1997, and 1,331 in the first 10 months alone of 1998 (UNESCO, 2000), with the 1998 figure representing 39% of the total 1998 output of teacher training colleges in Zambia (Zambia Ministry of Education, 2002a).

HIV/AIDS may contribute to teachers' resignations in several other ways as well. Staff may resign due to their own illness, or due to the need to care for family and friends who are afflicted with the disease, among others. From an economic point of view, HIV/AIDS may necessitate staff to seek alternative employment opportunities if the family's income is reduced due to a member's inability to work, and/or increased medical expenses. The disease may also lead to an increase in the number of opportunities available both within and outside of the education sector, as positions become vacated due to employee death. This is applicable to employment in Zambia and in the subregion as well. For example, one solution to the teacher crisis in Botswana has been the recruiting of foreign teachers, accounting for 6% of the teaching corps¹⁷. Zambians in particular are recruited to fill these posts, worsening the staffing situation in Zambia.

The second largest cause of attrition is retirement (25.2%). As stated in Section 4.3, Zambia has strict regulations regarding maximum retirement age of its teachers¹⁸. The third largest (9.9%) group is comprised of teachers who have resigned.

In this study, we investigate factors associated with the risk of voluntary teacher attrition only, not attrition associated with illness, retirement and/or death. The following section provides a brief review of the causes and impacts of teacher attrition as seen in the literature.

4.7 Attrition Literature¹⁹

Macdonald (1999) frames a review of literature on the issue of attrition by examining its patterns, factors that may contribute to attrition, its impact, and possible solutions.

4.7.1 Patterns of Attrition

Macdonald's review of the literature suggests that as rates of attrition, which vary from 5% to 30% worldwide, are examined, certain patterns emerge. Based on several studies (Gottelmann-Duret and Hogan, 1996; Gritz and Theobold, 1996), the review finds that attrition tends to be lower in developed countries than in developing ones; it tends to be lower during times of economic difficulty or stagnation than during periods of economic growth and prosperity; and it tends to be lower in urban areas than in rural ones, even in developing countries. The work of Murnane and Olson (1989) found that teachers with university degrees are more likely to leave the profession than those with minimal professional qualifications. Distinct attrition patterns emerge when examining teacher age and experience. In Macdonald's review, work from Huberman (1993) is used to show that attrition tends to be high in younger teachers entering the

¹⁶Note, however, that preliminary MOE 2002 EMIS data reports only 1.1% of its teachers having died in 2002 for all causes (preliminary 2002 EMIS data).

¹⁷ World Bank (2002c).

¹⁸ Retirement is mandatory for males at age 60 and for females at age 55.

¹⁹ This review is based on literature reviews by Macdonald (1999), Chapman and Mulkeen (2003) and Certo and Fox (2002), as well as on the work of Grissmer and Kirby (1997).

system. It then tapers off for mid-career educators, and increases again near the age of retirement. This is supported by the work of Grissmer and Kirby (1997).

4.7.2 Contributing Factors

Macdonald divides the factors that contribute to attrition into conditions that affect teacher service and the conditions of service themselves. Socioeconomic factors play an important role in teacher attrition by influencing employment alternatives for teachers. Literature such as Forojalla (1993) and Wagner (1993) suggests that a poor or weak economy with limited employment opportunities results in low attrition, while a strong economy may lead to loss of teachers to more attractive jobs in general, and in particular may drain the system of specialists with enhanced economic options, such as those with expertise in science or technology. This is supported by Grissmer and Kirby (1997), who cite their earlier research that identified teacher age, salary structure (including pay scale limits), non-education sector employment options, and teaching level and subject as factors influencing attrition.

Certo and Fox use the work of Ingersoll (2001) to point out that the work environment influences teacher attrition even after controlling for teacher and school characteristics. Elements of this environment include physical conditions, such as availability of books, classroom conditions, student-teacher ratios, interaction with colleagues, classroom observations, administrative support, and salary, among others. These factors affect teacher job satisfaction, which influences turnover and attrition. Other factors affecting teachers' service include lack of parental and/or community involvement, an inability to adapt to changing curriculum, teacher health, and comfort at their posts.

Both the ILO (1991) and Gritz and Theobald (1996) found that the inability to survive on a teacher's salary and the comparison of teachers' salaries to salaries of other professions lead to teachers exiting the system. Rodgers-Jenkinson and Chapman (1990) show that teacher pay scales that are overly bureaucratic and unrelated to teacher performance may decrease attrition for poorly qualified and low-performing teachers while raising attrition for well-qualified and high-performing teachers, effectively lowering the quality of teaching. As Grissmer and Kirby (1997) point out, this is the exact opposite of the goal (ideally, one would want high attrition of low-performing teachers and low attrition of high-performing teachers), and they advocate merit-based pay as a mechanism to encourage good teachers to stay in the system.

Aside from pay, research by Brown (1992), Burke (1996), Hargreaves (1994), Macdonald (1995), OECD (1990), Schools Council (1990) and Smyth and Shacklock (1998) also points to continued learning opportunities, increased responsibility, and varying of tasks as key issues for teachers when they are considering leaving the system.

Work by the National Center for Education Statistics, cited in Certo and Fox (2002), finds that in the U.S., 9.3% of teachers in public schools left the system before the end of their first year, while over 20% failed to reach 3 years of service before leaving. The authors point out the importance of mentoring and professional development opportunities in maintaining teacher job satisfaction, and they stress its increased importance during the early stages of teachers' careers when teachers are transitioning from a supportive environment of a training institution to a more isolated and unstructured classroom environment. For newer teachers, the transition from learner to teacher is often a difficult one, with everyday classroom management issues such as time planning, curriculum development, and student discipline challenging them, and administrative obligations "demotivating" them (Gritz and Theobald, 1996; Huberman, 1998; Willett and Singer, 1991). Macdonald's review also highlights the fact that for those new teachers who are poorly trained (e.g. untrained teachers brought into the system to fill a gap), these challenges are all the more

daunting, and these teachers may have a higher attrition rate than their trained colleagues (Kemmerer, 1990.)

These challenges are compounded by low initial levels of teacher commitment, resulting from the perception of teaching as a fall-back career and the planned use of skills and experiences acquired through teacher training as a stepping stone to a better career (Thompson, 1995, Chapman and Mulkeen, 2003). According to Chapman and Mulkeen (2003), teaching is perceived as a “last resort” career, especially for those who have been unable to gain admittance into university. They point out that this may result in those who enter teaching having low academic performance records.

Chapman and Mulkeen (2003) point to declining morale and motivation as key factors in teacher attrition all across sub-Saharan Africa, and they note that it affects teacher performance. Among factors contributing to low morale are problems associated with receiving pay, including delays and not receiving correct pay amounts. Chapman and Mulkeen point out that these problems also lead to teacher absence, with rural schools being adversely affected due to their distance from education offices, where teachers must go to sort out pay issues. These problems are also more problematic for rural teachers because, as Chapman and Mulkeen note (citing Hedges, 2002), these teachers are isolated from their families and support networks and are not in a position to rely on others for financial assistance when needed.

Further contributing to low morale is the degradation of professional standards of the teaching service in many sub-Saharan African countries. Chapman and Mulkeen cite the work of Gaynor (1998), who found that governments’ initiatives to place more teachers in classrooms quickly, at the expense of their training and professional development, may lead to “de-professionalization” of the career.

Motivation is adversely affected by the lack of professional development opportunities and recognition of high performance (VSO, 2002). The latter is exacerbated by the unclear processes used for promotion, which often seem unrelated to merit (Gaynor, 1998).

Another related factor is the inadequacy of supervision of teachers, including inspections. If Ministries cannot or do not place importance on inspections and supervision, teachers may begin to believe that the quality of instruction in schools is not important. Furthermore, in the absence of a sufficiently staffed, funded, equipped, and motivated inspectorate, school visits may become bureaucratic and administrative in scope, rather than constructive for the development of teachers’ skills (Chapman and Mulkeen, 2003).

Chapman and Mulkeen address the issue of teacher deployment by stating that rural postings are often undesirable and that this leads to issues of rural/urban equity. Among the reasons they cite for rural postings having low value are:

- Many teachers come from urban areas and wish to remain there (Hedges, 2002).
- Rural locations may be viewed as more dangerous and have limited medical facilities (Towse et al., 2002).
- Rural schools may be perceived to have poorer or inadequate facilities (World Bank, 1992).
- Urban postings more easily permit further studies and professional development.
- Single female teachers may feel rural areas are unsafe, and married female teachers may not want to leave their husbands (Gaynor, 1998).
- Rural locations may necessitate mastery of a local language, and teachers who do not speak that language are reluctant to live there.

The result of this low perception of rural postings is that teachers do not accept rural assignments, thus necessitating the use of untrained teachers and/or increasing the challenges for teachers who do accept postings (i.e., higher student-teacher ratios, double shifting). Gaynor (1998) found that

government policies of forcing teachers to take up rural posts led to high turnover and attrition, and resulted in a young and inexperienced rural staff. Samuel (2002) found that such policies make the prospect of teaching unattractive and contribute to low interest in the career.

Deployment practices affect teacher morale by creating instability in assignment from one year to the next, both from class to class and from school to school. This instability may also be caused by teacher absence for any number of reasons including training and illness.

4.7.3 Impact of Attrition

Attrition impacts the supply of teachers by putting additional pressure on teacher training colleges and universities. In systems that struggle to produce enough trained teachers to satisfy demand, attrition leads to the use of untrained or poorly trained teachers, which compromises the quality of education while at the same time demoralizing trained teachers who find themselves working among less qualified colleagues (Macdonald, 1999). Furthermore, when attrition takes the best and the brightest teachers from the system, it also takes school and community leaders, which impacts the quality of education as well as the work environment for those teachers who remain (Thompson, 1995). Coping with teacher attrition has meant doing more with less, as exemplified by increased class size, longer work days, split-shift schools, and the introduction of untrained or poorly trained teachers (ILO, 1991a, b; Konadu, 1994; Thompson, 1995).

Grissmer and Kirby (1997) point out that details of retirement programs influence how long teachers stay in the system, which in turn influences the timing and quantity of new teachers needed. They also point out that new teachers replacing old teachers has an impact on the education budget, as new teachers' salaries are likely to be lower than those of the experienced teachers who they replace. These issues that accompany attrition—timing, quantity, and financial implication—are critical pieces of information for education system planners.

4.8 Teacher Absenteeism

The difficulties caused by attrition in Zambia are further exacerbated by absenteeism. With instructional time limited to 3.5 hours per day (World Bank, 1999), teacher absence further reduces already limited learning opportunities.²⁰ According to the World Bank (1999), teachers have an estimated annual average of 500 hours of contact with students during the first 4 years of primary school, which is inadequate and well below the worldwide norm of 900 hours.

The World Bank's ESD Survey, in which teachers were asked to report their absences for the past month, found that 17% of teachers were absent on the day the survey was fielded (Das mimeo, 2003). Little difference was discerned between males and females or between teachers of different grades (Das mimeo, 2003).

The ESD study also examined the causes and duration of teacher absence and found that of those surveyed, 25% had taken some time off during the previous month, and that personal absence accounted for 192 of 376 episodes of absence (51%). The average duration of a personal absence episode was 3.1 days, with urban teachers taking an average of 0.9 days longer than rural teachers, and 34% of all respondents having taken some personal time during the past month. Leading causes for personal absence were attending funerals (41%), followed by own illness (25%) and illness of others (24%).

²⁰ In addition to teacher absence, student absenteeism is a significant problem in Zambia, with causes not unlike those of teacher absenteeism: illness, caring for family members, assuming the role of wage earner when parents are incapacitated.

Apart from personal absences, the ESDS also recorded “official” absences. These absences included those due to in-service training, extracurricular activities, and workshops. The ESDS reported that these official absences averaged 2.6 days per episode, with workshops accounting for 35% of episodes. Of those surveyed, 32% had taken official time off during the past month. The study determined that, in total, 12% of all teachers’ time was lost to absence, with funerals, illness, and training being the leading causes. Tables A5 and A14 in the Appendix Section 7.1 provide more details.²¹

Causes of absenteeism include: lack of supervision, lack of professional role models, lack of administrative capacity to distribute monthly salaries (teachers must often travel long distances to collect their salary), distance from home to work, and refusal to occupy rural postings (resulting in teachers who are assigned and paid but fail to assume their posts). Factors that are known to impact attrition as well as absenteeism include: poor working conditions, low teacher satisfaction, second jobs and illness.

As it does with attrition, HIV/AIDS plays a significant role in absenteeism in Zambia. HIV/AIDS may impact teacher attendance in several ways. First and foremost, an infected person typically endures between 12 and 14 illnesses before succumbing to the disease (Kelly, 1998). During these illnesses, teachers are unlikely to take official sick leave, as doing so would be financially detrimental. This teacher absence without being reported results in no substitute teacher being sent to replace the ill teacher, even when the absence is extended. In this case, students are either not taught at all, or a colleague is burdened with teaching a second, if not third, class or doubling enrollment in their own class. This lack of productivity creates inefficiency, as the absent teacher continues to be paid despite the fact that he or she is not working. The teacher cannot be terminated while ill, and thus system managers have little recourse (World Bank, 2002b).

In addition to absences caused by infected teachers’ illness, HIV/AIDS and the resulting death and funerals of colleagues (as well as family members) results in absence, often for several days and again without substitute teachers being deployed. The financial implications of teacher absenteeism are enormous: salaries paid to absent teachers are estimated at three times the cost to train replacements for teachers who have died (World Bank, 2002b).

Discussions with MOE staff provide insight into the regulations regarding absenteeism. Teachers are allowed a maximum of 10 consecutive days of absence without any repercussion; however, teachers are requested to provide an explanation for this absence. If teachers do not provide an explanation for their absence, the head teacher has the right to dock their pay though, apparently, this happens quite rarely. For teachers who are absent for less than 10 consecutive days, the clock starts over again the next time they are absent. In other words, they can again be absent for a maximum of 10 days without repercussion. After 10 consecutive days of absence, teachers are required to present a medical excuse. If teachers do not provide a medical excuse, they could be terminated. As previously stated, there is no link between teacher performance and teacher pay increases. Teacher pay is determined by teacher qualifications and teacher experience. Pay increases occur automatically on an annual basis. Teachers who perform well do have the option to earn additional money by taking on additional responsibilities. If the head teacher is not happy with the teacher's performance—due, for example, to recurring absenteeism—that teacher will not be given the opportunity to take on additional responsibilities.²²

²¹ These self-reported data were compared with head teachers’ records and were similar, but with some differences. According to head teachers’ reports, their own illness accounted for 35% of all absences, while family member illness accounted for 12% and funerals 15%.

²² This information was gathered via discussions with Mr. Charles Ndakala, Senior Systems Analyst of the Information Section of the Planning and Information Directorate, Headquarters, Zambia Ministry of Education (Fall 2003).

4.9 Teacher Satisfaction

Attrition and absenteeism are both impacted by teachers' job satisfaction. To gain a clearer understanding of teacher attrition and absenteeism in Zambia requires understanding the factors that influence teacher job satisfaction in general. For example, the U.S. National Center for Education Statistics (NCES, 1997) reports the findings of the NCES survey of schoolteachers and sheds light on the relationship between teacher conditions and satisfaction. It reports "parental support, student behavior, principal interaction, staff recognition, teacher participation in school decision-making, influence over school policy, and control in the classroom" are strongly associated with job satisfaction. These conditions were much more strongly related to satisfaction than were salary and benefits.

Ingersoll (2001) frames his examination of job satisfaction around teacher turnover, exploring the causes of job satisfaction and dissatisfaction and their implications for staff migration and attrition. He proposes reducing attrition and migration to stabilize the workforce for increased efficacy, rather than perpetuating the "revolving-door" syndrome. Among those "turning over"—i.e., either migrating or leaving the profession—42% reported "...either job dissatisfaction or the desire to pursue a better job, another career, or to improve career opportunities in or out of education." His findings support the NCES findings, with one notable exception. He, too, finds that school conditions such as administrative support, autonomy, and participation in school decision making and student behavioral issues influence job satisfaction that may result in turnover of one form or another. However, unlike NCES, Ingersoll found salaries to be an important element to consider when looking at teachers' satisfaction. He reports that teachers in schools with higher average salaries are less likely to leave (either the school or the profession). This decreased potential turnover is found in schools with higher levels of administrative support and in schools with fewer student behavior issues, as well as in schools where teachers have more autonomy and a greater role in school management. Ingersoll's study found that poor salary was cited as a contributing factor by 47% of migrating teachers ("movers") and 45% of those leaving the profession ("leavers"). The second most frequently cited reason was inadequate administrative support (38% and 30% for movers and leavers respectively), and other frequently (more than 10%) cited reasons include student discipline, lack of faculty influence, lack of community support, unsafe environment, lack of student motivation, and inadequate time to prepare.

Scott, Dinham, and Brooks (1999) report the results of their work using teacher data from Australia, England, New Zealand, and the United States to create a teacher satisfaction scale. From New Zealand data, they found that factors that influenced satisfaction were: school leadership, climate, and decision making; promotion procedures and opportunities; school infrastructure; school reputation; status and image of teachers; student achievement; pastoral care; workload; change and change management; and professional self-growth. Results from United States data yielded the following 16 satisfaction factors: student welfare; teacher welfare; teachers' associations; extra curricular activities; community involvement; student attitudes and behavior; collegiality; in-service training; professional self-growth; educational change; school infrastructure; professional efficacy; recognition; student and community interaction; empowerment; and workload. These findings are supported by Parkes and Stevens (2000), who analyzed survey data from public school teachers in Albuquerque, USA to identify the relationship between satisfaction and attrition. They reported that a combination of teachers' perception of his/her efficacy, professional development opportunities and support, school leadership and decision-making processes, relationship with students, school climate, and mentoring served as an effective predictor of teacher overall satisfaction.

5 RTI Survey

From May to June 2003, RTI, with the assistance of DCDM Consulting Ltd., a Zambian firm, conducted a survey of teachers in rural and urban schools randomly selected in each of Zambia's nine provinces. This survey instrument examines the risk of voluntary attrition, the occurrence of absenteeism, and the school and teacher characteristics associated with both. Characteristics considered in the survey include: school location, working conditions, teacher satisfaction, teacher qualifications and experience, salary and additional sources of income, classroom practices, migration, mobility and other relevant information. There are a total of 101 questions in the questionnaire. A copy of the questionnaire is provided in Appendix Section 7.2.

A preliminary test of the survey instrument was implemented in September 2002 in two primary schools in Lusaka and in a rural district close to Lusaka. The instrument was tested again to check the consistency and appropriateness of the questionnaire in one urban and one rural primary school in the Lusaka district in November 2002.

5.2.1 Target Population

The survey target population is composed of teachers and head teachers in primary education schools from the nine Zambian Provinces. There were a total of 40,488 primary teachers and 4,556 basic schools in Zambia in 2002 (Ministry of Education, 2002).

5.2.2 Sample Design

The schools in each of nine provinces of Zambia were partitioned into urban and rural schools. The survey was conducted in randomly selected urban and rural primary schools within each of the nine provinces in the country.

In the first stage of the survey, 30 schools (15 urban and 15 rural schools²³) in each province were randomly selected. Within each province, the sample was initially allocated to districts proportional to the number of schools in each district. However, there are many districts in the initial allocation that had no participating schools in the final sample. Delays in the start-up of fieldwork caused by multiple factors including the onset of the rainy season (December 2002) and later, teachers' strikes (February, March, and April 2003) left a very limited window of opportunity in which to conduct the fieldwork and meet the project's prescribed deadlines. The reduced timeframe necessitated that the more remote schools be excluded from the survey.

A random sample of the remaining unsampled schools in the *accessible* districts was then conducted to replace inaccessible district schools and nonresponsive schools. The final sample design is presented in the following table.

²³ Schools were classified as urban or rural according to the MoE's classification.

Table 12

PROVINCE	RURAL	RURAL	URBAN	URBAN	TOTAL
	NO. OF SCHOOLS	NO. OF SCHOOLS SAMPLED	NO. OF SCHOOLS	NO. OF SCHOOLS SAMPLED	NO. OF SCHOOLS
Central	252	9	45	21	297
Copperbelt	87	10	237	20	324
Eastern	592	21	27	9	619
Luapula	314	26	13	4	327
Lusaka	110	9	187	21	297
Northern	600	17	19	13	619
North-Western	355	24	11	6	366
Southern	522	9	55	21	577
Western	443	19	29	11	472
Total	3275	144	623	126	3898

In the second stage, two primary school teachers and one head teacher from each sampled school were interviewed. Since there is only one head teacher per school, head teachers were selected irrespective of gender. For teachers, interviewees selected one male and one female teacher from each school based on a prescribed method designed to ensure a random sample. This method is detailed in the DCDM field report (appendix 7.5). The total sample yield was 809 teachers and head teachers.

After undertaking the survey, 5% of respondents (that is, among the same teachers and head teachers originally surveyed) were resurveyed for quality control.

The fieldwork began on May 27th 2003 and was completed on June 13th.

5.2.4 Data Collection

DCDM was responsible for all data collection, including recruiting and training of supervisors and surveyors for conducting the face-to-face interview on school premises. DCDM specializes in survey research, and since 2000 they have had a fully trained and experienced pool of some 50 freelance surveyors in Zambia conducting face-to-face interviews. Surveyors and field supervisors were selected from the pool of surveyors and supervisors already working for the Central Statistical Office of Zambia and from among university students. The surveyors received training on interviewing techniques and proved effective, especially considering the large survey size and nation-wide sample. Close supervision guaranteed standardization and reliability of the data collection process. Based on past surveys requiring closely monitored fieldwork, some of the surveyors were given additional training to act as team leaders (field supervisors).

On average, each surveyor was responsible for administering approximately 30 questionnaires over a period of 5 days. For cost and time effectiveness, each province had a team of 27 surveyors comprised of 9 field supervisors and 18 enumerators. The field supervisors, apart from

conducting interviews, were also responsible for collecting completed questionnaires from field surveyors; controlling the quotas achieved and the quality of questionnaires, and conducting field accompaniments and random crosschecks. The field manager was responsible for monitoring the completion of quotas and checking, editing, and coding the questionnaires prior to data input. The re-survey was undertaken among 40 teachers and head teachers who were interviewed previously for the survey, and was carried out by the nine supervisors. Each supervisor conducted resurvey interviews in a different province from the one in which they were originally placed for the survey.

5.2.5 Data Processing

Data entry and verification of questionnaire completeness, consistency, and correctness of records took place in DCDM's Mauritius office starting on June 24th. The final data set was cleaned of inconsistencies, and frequency counts were undertaken to ensure completeness of records. The DCDM Mauritius team then coded and entered and edited the data. Please see appendix 7.5 for the DCDM field report.

Statistical analysis weights, needed to make inferences at the national level due to the complex nature of the sample design, were calculated by the RTI team. These weights compensate for gender and location (urban/rural) bias generated by the sample design. As with all samples, non-response bias is introduced when respondents choose not to participate. We were not able to use statistical analysis weights to compensate for the non-responses in this case as the needed documentation of the non-responsive schools was not available. Please see appendix 7.6 and 7.7 for a full explanation of the statistical weights used.

5.3 Models of Teacher Attrition Risk

As described in the literature review of Sections 4.7 and 4.9, there are many factors that cause teacher attrition and that impact attrition risk. These factors range from those which are specific to individual teachers, to characteristics of the schools and communities within which teachers work, to aspects of the teaching profession itself and the role and status of teachers in society as a whole.

Section 4.7 describes the main findings related to these factors in the literature on attrition. The current section moves beyond the findings of the literature and describes some of the behavioral and institutional channels/contexts through which the factors impact attrition risk. We do not attempt to catalog all of the ways through which these factors might operate, but seek rather to highlight some of the underlying detail concerning how these factors act to impact attrition risk.

Within the confines of the Zambia Teacher Attrition Survey, we may group these factors under the three headings shown below. For each of these headings, we describe the primary variables that we will use in the model estimations presented in Section 6.1. We also describe the relative importance of these variables in determining the risk that teachers leave the education sector/teaching profession and the risk of leaving the particular school at which the teacher is currently employed.

5.3.1 Individual Teacher Characteristics

Numerous characteristics of individual teachers impact attrition and attrition risk. These characteristics include:

Teacher age

Teacher age can be an important factor in determining attrition risk for several reasons. Temporal proximity to retirement and eligibility for pension/retirement benefits can make older teachers greater risks for attrition. Older teachers not near retirement, however, may believe that they have fewer opportunities outside of teaching, implying decreasing attrition risk as teachers age. Younger teachers, on the other hand, are more likely than older teachers to have education and training that is more in demand by current labor markets—training in computers and information technology, for example. The overall role of teacher age in determining attrition risk depends, therefore, on the net impact of these effects.

gender

As with age, teacher gender can have conflicting impacts on attrition risk. Female teachers might face discrimination in non-education labor markets and, therefore, be at lower risk of attrition. Career interruptions due to childbirth and childcare, however, can lead to increased attrition risk for female teachers. Again, the overall role of gender in determining attrition risk depends on the net impact of these effects.

highest level of education completed

The role of teacher education attainment in attrition and attrition risk, however, is less ambiguous. Teachers who have completed high levels of education are almost universally found to be higher attrition risks.

teaching experience (years)

Teachers who have been in the teaching force for a relatively long period of time are likely to be lower attrition risks for several reasons. More experienced teachers have passed through the most difficult period of teaching—the first several years of a teacher’s career—where attrition risk is highest. In addition, more experienced teachers might represent a group that has a higher commitment to teaching, an unobservable but highly important variable in determining attrition risk.

science/mathematics teacher

Most studies of attrition find that science and/or mathematics teachers (obviously, but importantly, individuals with science and/or mathematics backgrounds) are at greater risk of attrition. This heightened risk is typically attributed to the fact that the skills that these teachers possess are in relatively high demand by contemporary labor markets. Because of differences in the skill profiles demanded in urban and rural areas, a science and/or mathematics background might be a more powerful influence on attrition risk for teachers in urban settings than for teachers in rural settings.

teacher salary category

As with science/mathematics teachers, the effect of teacher salary on attrition risk is fairly clear. While the low salaries of teachers *as a whole* clearly contribute to attrition, teachers with higher salaries are less at risk of leaving the system than are teachers with lower salaries.

teacher is married or cohabitating

Marriage or cohabitation has conflicting impacts on attrition risk. Married teachers typically have a stronger economic and psychological “safety net” and are more able to cope with the hardships that leaving a teaching career impose. Because their spouse may also be locally employed, however, relocating to a new school or job is more difficult for married teachers than for unmarried teachers.

teacher was born in district where school/employment is located

As with marriage/cohabitation, attrition risk for teachers who are from the district where they are currently teaching is impacted in conflicting ways. Teachers who are teaching in the district where they were born are more likely to have existing family and other support networks. These networks make teachers more comfortable with their current lives, make teachers better able to withstand job stress, can help teachers deal with the low salaries in the education sector, and can be associated with lower attrition risk. Local support networks can, on the other hand, act to mitigate the financial and psychic costs of leaving an education post and can act to increase attrition risk. Overall, however, existing survey research and other findings typically point to lower attrition for teachers employed in the district where they were born.

time required to travel to school (minutes)

Travel from home to school impacts teachers in several ways.²⁴ Because travel is costly (both in direct financial terms and in because of the opportunity cost of teachers’ time devoted to travel), long travel to and from school lowers the financial return from teaching relative to employment that is geographically closer to the teacher’s residence. Long travel to school can also be (and be viewed as) dangerous, particularly for female teachers in some settings. Overall, longer travel times to school should act unambiguously to increase the risk of attrition.

has other employment

Whether or not teachers have other employment impacts—and is related to—attrition risk in several income-related ways. Having additional employment, whether in the education or non-education sectors, can serve as a signal that the remuneration from individual teaching posts is not adequate to support the teacher (and, where relevant, their family) and can be associated with elevated attrition risk. Also, teachers with “outside” employment who are considering leaving education or the school where they are currently employed would face less severe interruptions to their income should they leave their current education post. By acting to supplement income from teaching, having additional employment can, on the other hand, lower attrition risk. There are also non-income channels through which having additional employment impacts attrition risk. Having additional employment is often associated with increased absenteeism and attrition.

5.3.2 Teacher Satisfaction

The Zambia Teacher Attrition Survey contains numerous questions that allow construction of measures of teacher satisfaction with various aspects of the schools within which surveyed teachers are currently employed. As discussed in Sections 4.7 and 4.9, low teacher satisfaction has been shown to be one of the primary determinants of attrition and attrition risk. By

²⁴ Many of these arguments related to travel time to school apply equally well to discussions of student dropout risk.

combining a range of detailed questions into individual indices, we are able to construct indices covering teacher satisfaction with:²⁵

- salary and non-salary benefits
- job security
- school organization and administration
- performance of the school's head teacher
- student behavior and academic performance
- interaction with and support from parents and the community
- school physical facilities.

A priori, we would expect higher levels of satisfaction with any of these aspects to be associated with lower levels of attrition risk. Conversely, lower levels of satisfaction with any of these aspects should be associated with higher levels of attrition risk. Because particular satisfaction factors might dominate decision making for any given individual or subgroups, however, all factors might not be significant for all subgroups.

5.3.3 Other School, Community, and Professional Characteristics Data

A variety of school, community, and professional characteristics impact attrition and attrition risk. These characteristics include:

average student-teacher ratio at school

Teaching larger classes of students is inherently more difficult and, therefore, stressful than teaching smaller groups. On average, we can expect that higher student-teacher ratios should be associated with increased risk of attrition.

school size

It is more difficult for teachers—particularly younger, less experienced teachers just leaving the more supportive environment of teacher training institutions—to integrate into larger schools than into smaller schools. In addition, larger schools are more likely to impose higher amounts of administrative/reporting tasks on teachers and simultaneously providing less support in the understanding and completion of these tasks. All other things equal, we can expect larger school size typically to be associated with increased risk of attrition.

community type

Rural environments can be more difficult for teachers for a variety of reasons. Teachers might be required to master a local language with which they are not familiar; teachers are more likely to be isolated from their families and support networks; they are often deprived of amenities that they are accustomed to in the communities where they previously lived and/or where their teacher training institution is located; and teachers find it more difficult to access further professional development and training opportunities. Living in a more rural and/or isolated area, therefore, is likely to be associated with increased risk of teacher attrition.

²⁵ As with the teacher characteristic variables, each category of satisfaction index is followed by (i) the variable name used for the index in the estimations described below and (ii) the questions from the Zambia Teacher Attrition Survey that are used to construct the variable.

head teacher school management training**head teacher years of experience****head teacher highest level of education completed**

Schools having head teachers with specific training in school management, more years of experience, and, higher education attainment in general are more likely to well-run institutions where teachers can carry out their roles as classroom teachers. Head teachers with school management training are—assuming that their management training has been adequate—better able to identify motivational and satisfaction problems among their teaching staff and to intervene to help teachers. Teachers in schools where the head teacher head has had specific school management training, has more years of experience, and has completed a higher level of education are, other things being equal, likely to face lower attrition risk.

distance of school from education office (walking, minutes)

Teachers posted to schools that are farther from the nearest education office must travel long(er) distances to local education offices to receive their pay. This travel burden can lead to increased absenteeism and heightened attrition risk.

5.3.4 Specification of Attrition Risk Models

The Zambia Teacher Attrition Survey allows specification of variables that describe both teachers' risk of leaving the school where they are currently employed (termed ATRISKSC) and teachers' risk of leaving the education sector (termed ATRISKED). The current section describes the attrition models to be estimated using survey data for each of these attrition risk measures.

ATRISKSC which measures teachers' risk of leaving their current school is defined as follows:

- 0 = teachers never consider leaving school
- 1 = teachers consider leaving school once a year
- 2 = teachers consider leaving school twice a year
- 3 = teachers consider leaving school once a month
- 4 = teachers consider leaving school once a week but so far have taken not action to leave
- 5 = teachers consider leaving school once a day
- 6 = teachers consider leaving school once a week & they have taken action to leave (i.e they have sent out a CV)
- 7 = teachers consider leaving school once a day week & they have taken action to leave (i.e they have sent out a CV)

ATRISKSED which measures teachers' risk of leaving the education sector is defined as follows:

- 0 = teachers never consider leaving the education sector
- 1 = teachers consider leaving education sector once a year
- 2 = teachers consider leaving education sector twice a year
- 3 = teachers consider leaving education sector once a month
- 4 = teachers consider leaving education sector once a week
- 5 = teachers consider leaving education sector once a day
- 6 = teachers consider leaving education sector once a week & they have taken action to leave (i.e they have sent out a CV)
- 7 = teachers consider leaving education sector once a day week & they have taken action to leave (i.e they have sent out a CV)

Each type of risk is determined by three broad categories of underlying factors: teacher characteristics, teacher satisfaction with aspects of the teaching experience/setting, and non-

teacher characteristics. Equations 5.3.4.1 and 5.3.4.2, immediately below, show general specifications of how these factors map onto attrition risk.²⁶

$$5.3.4.1 \text{ ATRISKED} = F [(\text{teacher characteristics}), (\text{satisfaction}), (\text{other characteristics})]$$

$$5.3.4.2 \text{ ATRISKSC} = F [(\text{teacher characteristics}), (\text{satisfaction}), (\text{other characteristics})]$$

Because the decision to (and the risk of) leaving an individual school are different from the decision to (and risk of) leaving the education sector, below we will specify different factors as determinants of ATRISKED and ATRISKSC. In addition, different factors might be relevant for different subgroups of teachers. We will make these differences clear as well.

Based on the discussion above, we can begin to explain each of these broad categories of underlying factors.

Risk of Leaving the School Where Currently Employed

risk of leaving school where currently employed: classroom teachers

Equation 5.4.4.3 shows, for classroom teachers, the risk of leaving the school where the teacher is currently employed ($\text{ATRISKSC}^{\text{CR}}$) in terms of the individual factors discussed above:

$$5.3.4.3 \text{ ATRISKSC}^{\text{CR}} =$$

F [age, gender, education, qualifications, experience, science/mathematics teacher, salary, married/cohabitating, from district where school is located, travel time, has other employment, satisfaction with salary/benefits, satisfaction with job security, satisfaction with school management/administration, satisfaction with head teacher, satisfaction with students, satisfaction with parents/community, satisfaction with school facilities, average student-teacher ratio, school size, community type, head teacher highest level of education completed, head teacher management training, distance of school from education office]

risk of leaving school where currently employed: head teachers

For the head teacher subgroup, the basic set of determinants is retained, with two minor modifications: because no head teachers are science/mathematics teachers—implying zero variance in the variable and no possibility of explanatory power—the corresponding variable must be removed. For obvious reasons, head teachers were not asked to provide information regarding their satisfaction with the head teacher, and this variable is removed as well. Equation 5.3.4.4 describes determination of the risk of leaving school where currently employed for the head teacher subgroup ($\text{ATRISKSC}^{\text{HT}}$):

$$5.3.4.4 \text{ ATRISKSC}^{\text{HT}} =$$

F [age, gender, education, qualifications, experience, salary,

²⁶ “F” denotes, in general terms, a functional relationship between factor categories (or individual factors) and measures of attrition risk. The exact functional form for each type of risk and for each teacher group is, of course, different.

married/cohabitating, from district, travel time, has other employment, satisfaction with salary/benefits, satisfaction with job security, satisfaction with school management/administration, satisfaction with head teacher, satisfaction with students, satisfaction with parents/community, satisfaction with school facilities, average student-teacher ratio, school size, community type, head teacher highest level of education completed, head teacher management training, distance of school from education office]

risk of leaving school where currently employed: all teachers

For all teachers (a group that includes head teachers), the set of explanatory factors is perforce identical to that for head teachers. Equation 5.3.4.5 describes determination of the risk of leaving school where currently employed for all teachers ($ATRISKSC^{ALL}$):

5.3.4.5 $ATRISKSC^{ALL} =$

F [age, gender, education, qualifications, experience, salary, married/cohabitating, from district, travel time, has other employment, satisfaction with salary/benefits, satisfaction with job security, satisfaction with school management/administration, satisfaction with head teacher, satisfaction with students, satisfaction with parents/community, satisfaction with school facilities, average student-teacher ratio, school size, community type, head teacher highest level of education completed, head teacher management training, distance of school from education office]

Risk of Leaving Employment in the Education Sector

The models estimated for risk of leaving the education sector are similar to those for risk of leaving the school where currently employed. Several school-specific factors were removed, however, because they are more directly relevant to the risk/decision to leave an individual school rather than employment in the education sector. These removed factors are satisfaction with the school’s head teacher, satisfaction with the school’s facilities and buildings, the indicator of whether the teacher was born in the district where the school is located, the type of community in which the school is located, and satisfaction with job security in the current school assignment.

risk of leaving the education sector: classroom teachers

Equation 5.3.4.6 shows, for classroom teachers, the risk of leaving the school where the teacher is currently employed ($ATRISKED^{CR}$) in terms of the individual factors discussed above:

5.3.4.6 $ATRISKED^{CR} =$

F [age, gender, education, qualifications, experience, science/mathematics teacher, salary, married/cohabitating, has other employment, satisfaction with salary/benefits, satisfaction with school management/administration, satisfaction with students, satisfaction with parents/community, average student-teacher ratio, school size, head teacher highest level of education completed, head teacher management training, distance of school from education office]

risk of leaving the education sector: head teachers

For the head teacher subgroup, the basic set of determinants is retained, with two minor modifications: Because no head teachers are science/mathematics teachers—implying zero variance in the variable and no possibility of explanatory power—the corresponding variable

must be removed. For obvious reasons, head teachers were not asked to provide information regarding their satisfaction with the head teacher, and this variable is removed as well. Equation 5.3.4.7 describes determination of the risk of leaving school where currently employed for the head teacher subgroup (ATRISKED^{HT}):

5.3.4.7 ATRISKED^{HT} =

F [age, gender, education, qualifications, experience, salary, married/cohabitating, has other employment, satisfaction with salary/benefits, satisfaction with school management/administration, satisfaction with students, satisfaction with parents/community, average student-teacher ratio, school size, head teacher highest level of education completed, head teacher management training, distance of school from education office]

risk of leaving the education sector: all teachers

For all teachers (a group that includes head teachers), the set of explanatory factors is perforce identical to that for head teachers. Equation 5.3.4.8 describes determination of the risk of leaving school where currently employed for all teachers (ATRISKED^{ALL}):

5.3.4.8 ATRISKED^{ALL} =

F [age, gender, education, qualifications, experience, salary, married/cohabitating, travel time, has other employment, satisfaction with salary/benefits, satisfaction with school management/administration, satisfaction with students, satisfaction with parents/community, average student-teacher ratio, school size, head teacher highest level of education completed, head teacher management training, distance of school from education office]

6 Findings

6.1 Attrition Risk Model Estimation

Risk of Leaving the Education Sector (ATRISKED)

The regression results for the model of the risk of leaving the education sector (ATRISKED^{ALL}) for all teachers suggest that there are strong relationships between several candidate explanatory variables and ATRISKED^{ALL} (see Appendix 7.7 Table 7.7.1). The coefficients on these variables typically have the sign that we would expect (based on both behavioral logic and on the findings of the past studies described in Sections 4.7 and 4.9).

The data for all teachers yield the following results (see Table 7.7.1):

- being married or cohabitating is associated with a higher risk of leaving the education sector
- being more dissatisfied with the administration and management of the school where they are currently employed is associated with higher risk of leaving the education sector

- increased distance from the nearest education office to the school where the teacher is currently employed results in increased risk of leaving the education sector²⁷
- teaching in a larger school (as measured by total enrollment) is associated with higher risk of leaving the education sector.

These outcomes are all consistent with the previous studies of teacher attrition cited in Sections 4.7 and 4.9. While the overall explanatory power of the model is not high ($R^2 = 0.1565$ for the “all teachers” model, meaning that we have explained roughly 15% of the total variation in $ATRISKED^{ALL}$), the existence of these relationships is, in fact, more important as a guide for understanding the observable determinants of risk and in developing policy recommendations.

It is somewhat surprising, however, that increased dissatisfaction with other aspects of their current employment—salary/benefits and student behavior and performance, for example—are not significant determinants of increased attrition risk. Nearly 80% of respondents report being dissatisfied with their salary/benefits, however, and this lack of variation likely accounts for the lack of relation to attrition risk. It is also interesting to note that the survey data for all teachers show that higher average student-teacher ratios are associated with decreased risk of leaving the education sector.

When we consider various subpopulations of teachers (see Appendix 7.7 Tables 7.7.2 and 7.7.3), these results are broadly confirmed. There are, however, several interesting wrinkles that shed light on the characteristics of these subpopulations and that have policy relevance. We highlight these specific results, and one puzzling result, in the bullets immediately below:

- The role of being married or cohabitating as an increaser of attrition risk seems to be largely driven by female teachers and urban teachers. In terms of previous attrition studies (and the behavioral descriptions contained in section 5.3), these are probably not surprising findings, because (i) female teachers typically face higher attrition risk due to family-related career interruptions and (ii) urban areas often present more career options to those that leave the education sector and teachers with the safety net of a spouse’s income would face lower financial costs if they left the education sector to pursue other career options.
- For classroom teachers, increased dissatisfaction with the head teacher is an import factor in increasing attrition risk.²⁸
- For male teachers and for head teachers (a typically male subpopulation), dissatisfaction with salary and benefits has some explanatory power vis-à-vis attrition risk. While this is possibly due to male teachers being more likely to be the primary income-earner for their families, we cannot make an unequivocal conclusion without additional data.
- For head teachers, having had specific school management training significantly decreases the risk of attrition from the education sector.

Risk of Leaving the School Where Currently Employed ($ATRISKSC$)

As with $ATRISKED^{ALL}$, the regression results for the model of the risk of leaving the school where the teacher is currently employed ($ATRISKSC^{ALL}$) for all teachers suggest that there are strong relationships between candidate explanatory variables and $ATRISKSC^{ALL}$ (see Appendix 7.7 Table 7.7.4). The coefficients on these variables also typically have the sign that we would

²⁷ Because the majority of rural respondents live far from local education offices, distance to the education office is not likely to be a factor that explains attrition risk for rural teachers.

²⁸ Note that this variable was not included in the analysis for all teachers (including head teachers) because head teachers did not respond to this question.

expect (based on both behavioral assumptions and on the findings of the past studies described in Sections 4.7 and 4.9).

The results for all teachers show (see Appendix 7.7 Table 7.7.4). that:

- being married or cohabitating is associated with a higher risk of leaving the school where they are currently employed
- being more dissatisfied with the administration and management of the school where they are currently employed is associated with higher risk of leaving the education sector
- being more dissatisfied with student behavior and performance is associated with higher risk of leaving the education sector
- increased distance from the nearest education office to the school where the teacher is currently employed results in increased risk of leaving the school where they are currently employed
- there is no statistically significant relationship between the distance that teachers must travel from their homes to the school where they are employed.

As with $ATRISKED^{ALL}$, the overall explanatory power of the model is not high ($R^2 = 0.1605$ for the “all teachers” model, meaning that we have explained roughly 16% of the total variation in $ATRISKED^{ALL}$). The existence of relationships between attrition risk and underlying factors is, however, an important source of understanding of the observable determinants of risk and in developing related policy recommendations.

These results generally hold for various subpopulations of teachers as well, with some interesting variation (see Appendix 7.7 Tables 7.7.5 and 7.7.6):

- For male teachers, having additional employment significantly increases the risk of attrition from the school where the teacher is currently employed.
- For female classroom teachers, being a science and/or mathematics teacher significantly increases the risk of attrition from the school where the teacher is currently employed.
- For all classroom teachers (and for the urban and female subgroups of classroom teachers), dissatisfaction with the head teacher significantly increases the risk of attrition from the school where the teacher is currently employed.
- For head teachers, having had specific school management training significantly decreases the risk of attrition from the school where the teacher is currently employed. This effect exists for all head teacher subgroups.

6.2 Basic Demographic Findings

Nearly two thirds, 63%, of all staff are female. This figure is considerably higher in urban schools (72%) than in rural ones (58.5%). The contrast is much more stark when examining head teachers separately—only 17% of rural head teachers are female, compared to 41% of urban teachers. Regional aggregation shows that Luapula, North-Western, and Western provinces have the lowest percentage of female staff, while Copperbelt and Lusaka have the highest.

Most staff, 70%, are married or cohabitating. This does not differ drastically between urban (71.2%) and rural (69.4%) staff, but is higher for male staff (81.6%) than female staff (63.2%). Interestingly, the largest group not married or cohabitating is rural female staff.

The average staff age is 36 years old, with urban staff 3 years older on average (38) than rural staff (35). Urban teachers are older than rural teachers on average (37.8 compared to 34.1), and

urban head teachers are slightly older than rural ones (48.52 and 47.15 respectively). The oldest staff are found in Copperbelt (40.1); they are nearly 8 years older than staff in North-Western Province (32.2).

6.3 Experience, Training, and Education

Over 90% of staff in Zambia have completed secondary or higher education and have also received teacher training or certification. This figure is somewhat higher for urban staff, due to the fact that far more urban staff fall into the category of having completed secondary education and holding a certificate (54.7% compared to 40.5%). Conversely, a higher percentage of rural staff fall into the category of having completed higher education and teacher training (49%) than urban staff (39.8%).

Looking at differences by province, only two Provinces have less than 80% of their staff having completed secondary or higher education and having had teacher training: Southern (70.5%) and Western (79.4%) Provinces. In Southern Province, nearly 30% of staff have completed higher education but have not had teacher training, and in Western Province 11.5% of staff have had teacher training but have not completed secondary education.

On average, staff in Zambia have nearly 11 years of experience as a teacher and almost 12 years experience in the education sector. Urban staff have more experience than rural staff both as a teacher (13.3 years compared to 9.6) and in the education sector (14.6 and 10.8). Figures are very similar for teachers separately, with urban teachers more experienced than rural teachers. Urban head teachers have fewer years' experience as a teacher on average (6.4 years) than rural head teachers do (7.4 years), though urban head teachers have more experience in the education sector (24.3 years) than rural ones do (22.3 years), suggesting that they have more experience as a head teacher.

Staff in North-Western Province are very inexperienced compared to other provinces: they average 6.59 years of experience as a teacher and 7.45 years in the education sector, less than half the experience of staff in Copperbelt (14.5 and 17.5 years respectively). Staff in Eastern, Luapula, and Northern Provinces have less than 10 years' experience on average in the sector and as a teacher.

Years of education do not vary much from the national average of 14.6 year when looking at urban/rural differences, and head teachers have less than 1 year more education on average than teachers. Only two Provinces stand out when looking at staff education: Western Province, with 13.6 years on average, and Lusaka, with 16.5 years on average.

Twenty percent of all staff have had school management training, with slightly more rural staff having been trained than urban staff. Regional figures vary from 4% of staff in Copperbelt to 38.9% in Southern Province. More urban head teachers (75.8%) have been trained than their rural counterparts (66.5%). This is an important distinction to make, since it is likely the head teacher who may have greater opportunities to apply this management training.

Table 13. Teacher and Head Teacher Characteristics

	Total	Total		Teachers		Head Teachers	
		Urban	Rural	Urban	Rural	Urban	Rural
% Male	37	28	41.5	27.2	38.5	59	83
% Female	63	72	58.5	72.8	61.5	41	17
% Married	69.1	69.1	69.2	68.9	67.4	77.8	93.5
% with School Mgmt Training	19.9	14	22.8	12.4	19.7	75.8	66.5
% who live in district	99.5	99.2	99.7	99.2	99.7	98.2	100
% born in district	16.3	16.6	16.1	16.6	15.5	16.5	24.2
% born in province	33.6	16.7	42.1	16.7	41.9	18.1	44.9

% who live close to school	70.6	59.6	76.1	59.9	75.5	44.9	85.1
% who worked in a different school last year	9.7	6.4	11.3	6.4	11.6	7.1	7.3
% with more than 1 job	7.4	9.2	6.5	9.3	6.2	4.3	11.1
% receiving non-salary benefits	21.9	21.4	22.2	21.5	21.2	15.9	35.5
Average age	36.03	38.05	35.01	37.78	34.14	48.52	47.15
Average years experience as a teacher	10.86	13.27	9.64	13.45	9.80	6.43	7.4
Average years experience in education sector	11.99	14.62	10.77	14.34	9.9	24.26	22.34
Average years of education	14.61	14.91	14.46	14.9	14.39	15.32	15.39

Table 14. Staff Highest Level of Education by Rural/Urban

	Total	Rural	Urban
1. Complete primary education	0.5	0.7	0.0
2. Incomplete secondary education	0.1	0.1	0.2
3. Incomplete higher education	0.0	0.0	0.0
4. Incomplete secondary education plus teaching or teacher	2.2	2.1	2.5
5. Complete secondary education but not specific teacher or certification	0.5	0.7	0.2
6. Complete secondary education plus teaching training or certification	45.3	40.5	54.7
7. Complete higher education but no specific teacher training or certification	5.4	6.9	2.5
8. Complete higher education with specific teacher training or certification	45.9	49.0	39.8
9. Master Degree	0.0	0.0	0.1
Complete higher or secondary ed with teacher training or certification (6 or 8)	91.2	89.5	94.5

6.4 Staff Mobility and Proximity to School and Support

Almost all staff live in the district where they work, and 70% of them say they live “close” to the school. More rural staff live close to their schools than urban staff. On average, it takes 28 minutes for staff to walk to school from their house, with urban staff walking 39 minutes and rural staff 22 minutes. These average walking times vary by province, with staff in Eastern Province walking an average of 16 minutes to get to school, while staff in Copperbelt walk for nearly an hour.

Only 16% of staff were born in the district in which they live, and this hardly varies between urban and rural staff. It does vary from province to province though: only 5% of staff in Central Province were born in the district where they live, compared to one-third of all staff in Western Province. One-third of all staff were born in the province in which they work, with the figure much higher for rural staff (42.1%) than for urban staff (16.7%).

Approximately 10% of staff say they worked in a different school last year. The percentage of new teachers is higher among rural staff (11.3%) than urban staff (6.4%) and varies from 1% in Copperbelt to 20% in Western Province.

It would take staff an average of 100 minutes to walk to the closest education office, with rural staff farther away (110 minutes) than urban staff (80 minutes). Staff in Northern Province have the shortest average walk to an education office (68 minutes), while staff in Western Province would have to walk an average of 169 minutes.

Table 15. Staff Distance from School to Home and from School to Education Office

	Distance from Teachers Residence to School (Minutes Walking)	Distance to Nearest Education Office (Minutes Walking)
Total	28	100
Rural	22	110
Urban	39	80
Central	19	130
Copperbelt	57	118
Eastern	16	113
Luapula	21	84
Lusaka	30	91
Northern	21	68
North-Western	37	91
Southern	20	84
Western	13	169

6.5 Staff Compensation

Nearly 30% of staff earn between 400,001 and 500,000 Kwacha per month²⁹, and another 26% earn between 600,001 and 700,000 K per month. Three out of 4 earn between 400,001 and 700,000 per month. More rural staff are in the bottom third of this range than urban staff, who have a greater share near the top.

Forty-one percent of Lusaka Province staff earn more than 700,000 per month, compared to only 6.1% of staff in North-Western Province. At the same time, less than 1% of Lusaka staff earn less than 400,000 per month, compared to 17.2% of staff in Copperbelt.

Only 7.4% of all staff have more than one job. Differences among provinces are substantial, from 0% in Luapula to over 20% in Lusaka. Rural staff are less likely to have a second job (6.5%) than urban staff (9.2%). These figures are almost identical when examining teachers separately from head teachers, but rural head teachers have second jobs more often (11.1%) than urban ones (4.3%).

Approximately 22% of all staff receive some sort of non-salary benefit, including classroom teaching increments, transportation allowances, overtime, food stamps, housing allowances, or housing. The same share of rural staff and urban staff receive these benefits, and the figures for urban and rural teachers do not differ. However, like second jobs, provincial differences are large: less than 1% of staff in Northern Province receive benefits, while over half (54.5%) of staff in Western Province receive non-salary benefits. The percentage of rural head teachers receiving benefits is more than double the figure of urban head teachers (35.5% compared o 15.9%). This is particularly interesting given the fact that rural head teachers are more likely to have additional sources of income as well.

²⁹ October 2003 exchange rate was 1 US Dollar (USD) = 4,651.60 Zambian Kwacha (ZMK)

Table 16. Percent of Staff by Monthly Salary, by Rural/Urban

	Total	Rural	Urban
Less than 300,000 K	1.4	0.7	2.6
300,000 - 400,000 K	8.0	8.1	7.8
400,001 - 500,000 K	29.3	33.0	22.0
500,001 - 600,000 K	17.8	18.2	16.9
600,001 - 700,000 K	26.1	23.8	30.3
700,001 - 800,000 K	11.0	7.7	17.4
800,001 - 900,000 K	3.6	5.0	0.8
900,001 - 1,000,000 K	2.0	2.6	0.8
More than 1,000,000 K	1.0	0.9	1.3
400,001 K -700,000 K	73.2	75.0	69.2
over 700,000 K	17.6	16.2	20.3
less than 400,000 K	9.4	8.8	10.4

6.6 School-level Data

The average student-teacher ratio in urban schools is lower (38.4) than that of rural schools (42), with a national average of 41.4. Provincial averages range from just under 29 to 1 in North-Western Province to 53 to 1 in Eastern Province.

Urban schools have an average enrollment (1400) of nearly double rural schools (754), the national average being 858. Provincial means range from a low of 473 in Western Province to over 1400 in Lusaka.

The national average percentage of students absent on a typical day is just under 8%, with rural schools having a higher student absenteeism rate (8.4%) than urban schools (5.9%). Average student absence is lowest in Copperbelt (6%) and highest in Northern and North-Western Provinces (just over 10%).

National teacher absenteeism³⁰ (as measured by the percentage of teachers not at school on time) is 17.6%. Urban schools have a higher percentage of staff not arriving on time (24.2%) than rural schools (16.7%). Differences among provinces are marked: less than 1% of staff in Eastern Province fail to arrive on time or at all, while 31.6% of staff in Lusaka are not at school at its opening.

Table 17. School Characteristics

	Total	Urban	Rural
Student-teacher ratio	41.44	38.44	42.01
Mean school size	858.13	1400.58	754.09
Average % of students absent	7.97	5.94	8.36
% of students who start and finish school year	96.76	97.29	96.66
Average % of teachers not on time	17.56	24.15	16.63

³⁰ It is important to keep in mind that the survey was fielded on different days of the week and at different times of the month. Accordingly, any conclusions about teacher absenteeism related to travel to collect pay may not be able to be drawn from this data.

6.7 Absenteeism

Data about teacher absenteeism were captured using head teachers' responses to the following questions: "How many teachers are supposed to be here today in the morning?" and "How many teachers arrived on time this morning?" A variable PCTABS was constructed to represent the percentage of the school's teachers who did not arrive at school on time. While this method of estimating absenteeism does not differentiate between absence and lateness, it may be a more reliable source of teacher behaviour than self-reported attendance data.

The average percentage of teachers who had not arrived at school at the time of opening is 17.6%. This supports the findings of the World Bank's ESDS survey, which found 17% of teachers absent.

Because the PCTABS variable is a school-level variable, it sheds light on the number of teachers not on time and/or absent rather than the characteristics of teachers and reasons for absence and accordingly should be examined in terms of schools' characteristics. The ability to identify school characteristics that are associated with increased absenteeism/tardiness will enable policy recommendations to be made, ultimately increasing the amount of learning time that takes place and increasing the efficiency of the system.

6.7.1 Location

The World Bank study found that absence episodes were approximately evenly divided between "personal" and "official" reasons. Personal reasons include own illness, illness of others, and funeral attendance, while official absences included meetings, workshops, collecting pay, obtaining supplies, and filing requests and complaints, among other. While the location of the school may have only minimal impact on teacher attendance as it concerns these personal absences (increased travel time to attend funerals, lack of medical facilities, etc.), school location may very well be a significant factor in official absences, as the more remote the school is, the further one must travel for these official missions. Accordingly, we examined school location characteristics and the PCTABS variable.

There are considerable differences from province to province. The mean is highest in Lusaka Province, where almost one teacher in three (31.5%) is not at school, and is lowest in Eastern Province, where nearly 100% of schools report no absence. On the other hand, nearly half of the schools in Northern Province and Southern Province report more than 20% absence. Absenteeism is also higher in urban schools (24.1%) than in rural ones (16.6%). Over half of rural schools report 0% teacher absenteeism, as compared to only 30.5% of urban schools.

Table 18. Absenteeism by Province

Province	Mean Absenteeism	% of schools reporting No Absenteeism	% of schools reporting Low Absenteeism (20% or less)	% of schools reporting Medium/High Absenteeism (20.01% or higher)
Central	19.2	33.7	22.0	44.3
Copperbelt	17.2	35.1	26.2	38.7
Eastern	0.1	99.5	0.0	0.5
Luapula	8.5	67.9	7.7	24.5
Lusaka	31.6	20.2	35.7	44.0
Northern	21.3	37.9	12.2	49.9
North-Western	19.9	47.2	14.3	38.5
Southern	24.5	38.5	13.0	48.4
Western	21.7	30.6	23.2	46.2

Absenteeism data was analysed in using the distance from the school to the District Education Office, in order to examine the impact that additional travel time to tend to administrative issues has on teacher attendance. The results do not support the idea that distance from the seat of administration impact attendance: Schools within 1 hour's walk of the DEO had a higher percentage of teachers not present/on time than more remote schools, and more of them fell into the category of Medium/High Absenteeism than schools farther away.

Table 19. Absenteeism by Distance to DEO

Walking Time to DEO	Mean Absenteeism	% of Schools Reporting No Absenteeism	% of Schools Reporting Low Absenteeism (20% or less)	% of Schools Reporting Medium/High Absenteeism (20.01% or higher)
Under 1 hour	29.5	27.7	8.6	63.7
1 hour to 2 hours	17.2	60.7	1.9	37.4
Over 2 hours	9.7	56.9	25.8	17.3

6.7.2 School Organization and Size

Teacher absenteeism was also examined in conjunction with school size (total student enrollment) and student-teacher ratio (including full- and part-time teachers).

Absenteeism rates appear to be associated with school size, with small schools reporting lower mean absenteeism than large schools and more smaller schools falling into the categories of no and lower absenteeism than large schools. A possible explanation for this association is that as school size increases, the ability of the school to function at a minimally acceptable level, however that may be defined, is not as seriously threatened by teacher absence. For instance, in a school of only two or three teachers, as is likely the case in a school with fewer than 100 students, the absence of even a single teacher jeopardizes the school's ability to function properly, resulting in either cancellation of classes or extra burden for those teachers who are at school. Teachers in these schools may rely on distance learning opportunities in place of attending meetings or workshops, which would reduce absenteeism.

Table 20. Absenteeism by School Size

School Size	Mean Absenteeism	% of Schools Reporting No Absenteeism	% of Schools Reporting Low Absenteeism (20% or less)	% of Schools Reporting Medium/High Absenteeism (20.01% or higher)
Very small school - up to 100 students	0	100	0	0
Small school - 101 - 500 students	14.2	59.9	12.1	27.9
Medium school - 501-1000 students	14.8	54.9	13.8	31.3
Very large school - more than 1500 students	23.2	33.2	18.1	48.7

Absenteeism may also be related to student-teacher ratio. Schools with student teacher ratios under 30:1 report lower mean absenteeism and a smaller percentage of them report high absenteeism than schools with student-teacher ratios of between 30:1 and 60:1. Interestingly, schools with exceptionally high student-teacher ratios of over 60:1 have low average absenteeism. As above, this may be related to the schools' ability to cope better with the

“official” absence of a teacher if there are fewer students who would need to be taught by a colleague.

Table 21. Absenteeism by Student-Teacher Ratio

Student teacher ratio group NEW	Mean Absenteeism	% of Schools Reporting No Absenteeism	% of Schools Reporting Low Absenteeism (20% or less)	% of Schools Reporting Medium/High Absenteeism (20.01% or higher)
Under 30:1	14.6	59.4	11.3	29.3
Between 30:1 and 40:1	20.3	40.8	22.2	37.0
Between 40:1 and 60:1	20.3	40.7	13.6	45.8
Over 60:1	6.8	77.8	7.2	15.0

For both school size and student-teacher ratio, one can not ignore the possibility that the environment in large schools or in schools where teachers are expected to teach in crowded classrooms demoralizes or demotivates staff, which may impact their level of commitment and dedication and may result in their increased absence or lateness.

6.8 Conclusions

Based on these results and our understanding of the management regulations/structures existing in the primary education system in Zambia, some preliminary recommendations emerge. Further research and dialogue with Ministry of Education officials, teacher and parent representatives, and other stakeholders would be needed to fully investigate and formulate policy recommendations.

- First, additional training for head teachers in school management and administration should be investigated as a potentially powerful and cost-effective means of reducing attrition risk for both head teachers and for classroom teachers.³¹ The survey data clearly show that, for head teachers, specific training in school administration and management is strongly associated with lower risk of leaving both the school where the head teacher is currently employed and employment in the education sector. Further, for classroom teachers, both types of attrition risk are decreased when (i) respondents are satisfied with school management and administration and (ii) respondents are satisfied with the head teacher. Respondents are more frequently satisfied with school management and administration when the head teacher has had specific training in school administration and management.³²
- Establishing a closer link between schools and the District Education Office (DEO) via facilitated communication/contact should also be investigated as a means to help lower attrition risk.³³ The survey data show that as the distance from schools to the DEO increases, the risk increases both of (i) attrition from the school where the teacher is currently employed and (ii) attrition from the education sector overall. It is likely that this effect operates through at least two channels. First, because teachers must travel greater distances to receive their salary, they bear direct financial and opportunity costs and are more likely to experience absenteeism from their school. Second, it is more difficult for DEOs to provide the support that teachers—particularly new teachers—need. While it is essentially impossible (due to a variety of practical considerations) to relocate schools or significantly increase the number of DEOs, a better relationship and/or increased contact between these offices and the school would be beneficial. The effect of such an intervention is likely to be strongest for classroom and urban teachers. Further research is needed to fully explore what specific difficulties arise when the distance from the DEO increases and what steps could be taken to alleviate these difficulties.
- The risk of attrition is greater for individuals who are married or cohabitating. As was stated in section 2, regulations regarding postings appear to be quite stringent “Newly appointed teachers who resist deployment to MOE’s identified schools on marital grounds shall not be employed....” (Republic of Zambia Ministry of Education, 2001b). An investigation of policy options that would help retain these married teachers is warranted. A more flexible posting system, one that would allow teachers to remain with their families, is one example.

³¹ See Appendix 7.8 Tables 7.8.1 through 7.8.6.

³² (i) The mean level of satisfaction with school administration and management is higher for teachers where the head teacher has had specific training in school management.

³³ See Appendix 7.8 Tables 7.8.1 through 7.8.6.

With regard to absenteeism, one policy recommendation emerges:

We found that the overall level of absenteeism 17.6% was fairly high. The current management policy allows a significant amount of teacher absenteeism with little or no disciplinary repercussion to teachers. An examination of policies that more closely link teacher performance to salary should be considered.

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