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Time to Teach: *A study on the determinants of teacher absenteeism in sub-Saharan Africa.*

Teachers attending classes, and engaging in effective teaching, is a critical prerequisite to educating school-going children. Recent evidence show rates of teachers' time-on-task is less than half of teaching time in some settings of sub-Saharan Africa, yet there remains only a limited evidence base on how policies and practices – at various level of the education system – influence different types of absenteeism. This research proposal aims to deepen understanding of the ecology of teacher attendance i.e., the interaction between teacher management policies, their implementation gaps, perceived roles and responsibilities of stakeholders involved (e.g. teacher, head teacher, community, MOE officials), and teacher motivations to teach related to both extrinsic and intrinsic incentives. By using the concept of multilevel teacher absenteeism and qualitative research methods, the study aims to identify bottlenecks of each level of teacher absenteeism i.e., absent from school, absent from classroom, absent from teaching, and absent from pedagogy and content knowledge. Analysis will draw on qualitative data collected through intensive field research in a number of countries in sub-Saharan Africa. The output of the project will be practical recommendations for systemic and policy reform tailored for project countries, including implementation strategies, for making positive impacts on teacher-pupil interaction time, with a view to boosting levels of school quality and student achievements.

I. Background

Research Motivations

Learning is an outcome of a complex interplay of educational inputs such as teacher characteristics, learning materials, and school infrastructure, and the educational processes taking place in the classroom, characterized by learning time, and child-centred learning philosophy and practice. In recognition of the interconnection of various factors in delivering quality education, this research project will investigate a fundamental prerequisite for learning: teacher attendance.

Disturbingly high rates of teacher absenteeism are observed in many developing countries. The Service Delivery Indicators (SDI) surveys in seven African countries found that, on an average school day, between one-quarter to half or all teachers in primary schools are absent from *classrooms* where they are contracted to teach (Annex 1). Far from being an issue for African countries only, an early study by Chaudury et.al. (2006) show that rates of teacher absenteeism from *school* in Bangladesh, Ecuador, India, Indonesia, Peru and Uganda ranged from 11 to 27 percent.

Teacher absenteeism is a significant source of inefficiency in the education system. It is estimated that, on average across all of the SDI countries, the loss of teaching hours due to absenteeism can be presented as a waste of approximately 46 cents in every dollar invested in

education– equivalent to an annual wastage between 1 to 3% of GDP (Annex 2).

Furthermore, teacher absenteeism is also an issue of equity. The Afrobarometer data, which was collected from 36 countries in Africa[1], shows a strong association between levels of teacher absenteeism and marginalized and/or vulnerable sub-populations. Indeed, regression results indicate a higher chance of experiencing teacher absenteeism among marginalized ethnic groups and those who are economically worse off (see Annex 3). Similar studies in India, Peru, Kenya, Zambia, Pakistan, and Papua New Guinea also show higher rates of teacher absenteeism for the more remote or poorly funded schools and poor students (Kremer et.al. 2005, Alcázar, Rogers, Chaudhury, Hammer, & Muralidharan, 2006; Glewwe, Ilias, & Hammer, 2010; Das, Habyarimana, & Krishnan, 2007; Reimers, 1993).

Altogether, tackling teacher absenteeism and improving motivation to teach can begin to address global learning issues that hinder efficient and equitable use of education resources. It is also a critical factor to achieve SDG4, which prioritizes quality education (measured as learning outcomes and skills at different points in the education cycle) and promotes equitable access to education regardless of gender, socio-economic status, ethnicity or any other individual and family background through shedding light on hidden social inequity.

Research Gap and Conceptual Framework

Although policy makers and education stakeholders are increasingly aware of the importance of teacher absenteeism issues, and the role of teacher management policies and practices to address this, there is only a limited evidence base on how policies and practices – at various level of the education system – influence different absenteeism at different levels (school, classroom, and so on). This lack of evidence contributes to difficulties in designing effective teacher management policies to increase teacher motivations and opportunities to teach,[2] and to difficulties in implementing effective reforms of teacher management (Banerjee & Duflo, 2006).

One of the most comprehensive systemic reviews on the issue of teacher absenteeism is done by Guerrero & EPPI-Centre (2012), which identified nine quality quantitative papers out of over 18,000 papers that use experimental or quasi-experimental designs on the impact of programmes aimed at increasing teacher attendance in developing countries. Their findings suggest that direct interventions to improve teacher attendance (coupling monitoring systems with rewards) have a positive and statistically significant effect on teacher attendance (Duflo, Hanna, & Ryan, 2012; Cueto, León, & Deustua, 2008). Furthermore, that community involvement in students' education and provision of incentives schemes for students have a positive and significant effect on teacher attendance.

Student achievement, however, were not shown to increase in the two studies mentioned above, and available empirical findings do not strongly support direct impacts of teacher attendance on

[1] http://www.afrobarometer.org/.

[2] And how different extrinsic and intrinsic pressures and incentives have unique trade-offs and limitations, and sometimes one crowds out the other.

learning outcomes. This is partly due to that fact that, as the SDI survey results (Annex 1) show, teacher attendance in *school* does not necessarily mean that teachers are motivated and provide education in *classrooms*. Duflo et al. (2012) shows that the percentage of teachers interacting with students, and the use of a blackboard, were not affected by an incentive program which linked teacher salary to teacher attendance at school.

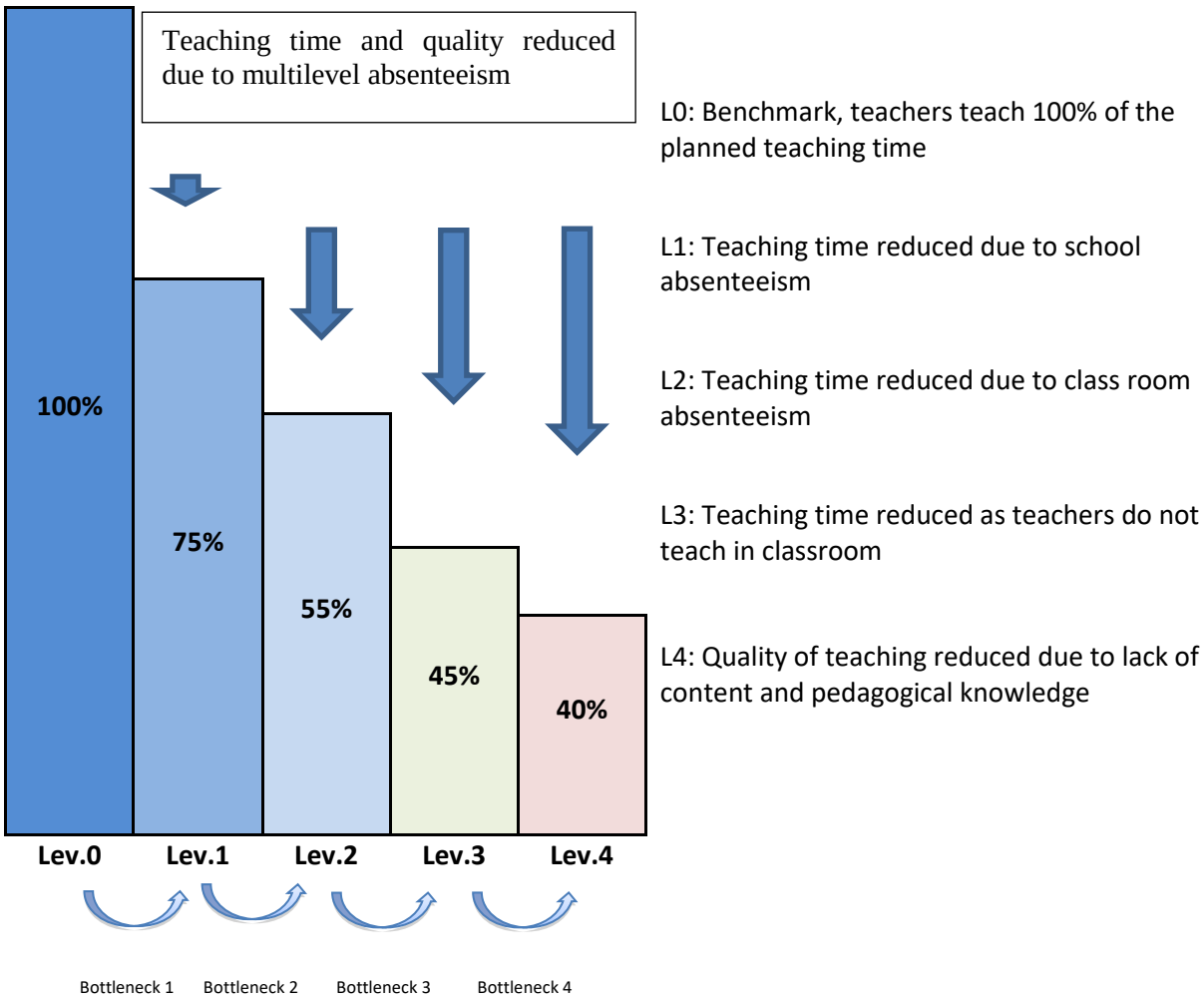
In contrast, existing evidence suggests that output-based incentive programmes improved student achievement, but this was not due to improvements in teacher attendance (Muralidharan & Sudaraman, 2011; Glewwe et al., 2010). Under the output-based incentive programs, teacher-student interaction improved, mediating the link between teacher school attendance and improved achievement. Using SDI data, Bold et al. (2017) show that teacher's content and pedagogical knowledge is a critical factor to improving student achievement. These findings imply that the relationship between attendance, motivation to teach, and pedagogical knowledge needs to be unpacked in order to understand the learning mechanisms and address issues that hinder teachers from providing education and stop children from learning.

The dynamics between teacher attendance and student achievement could be better understood by introducing the concept of multi-level teacher attendance (absenteeism) i.e., the different levels of teacher absenteeism related to attendance at school, attendance in the classroom, attendance in the classroom and teaching, and even attendance in classroom teaching with appropriate pedagogical and content knowledge.

The concept of the multilevel attendance/absenteeism is represented by Figure 1. Factors that hinder teachers to progressively achieve a higher level of attendance have direct effects on quality learning time for students. Some interventions aim to improve teacher attendance in school, which implicitly address the level 1 attendance issues (e.g., simple extrinsic incentive schemes to compel teachers to be present in school), and other programs (e.g., output-based performance pay) indirectly provide incentives to address the absenteeism issue at the classroom level or the student-teacher interaction level. Teacher training policies (pre-service and in-service) could be understood as policies to address quality standards at the level 4 teacher attendance.

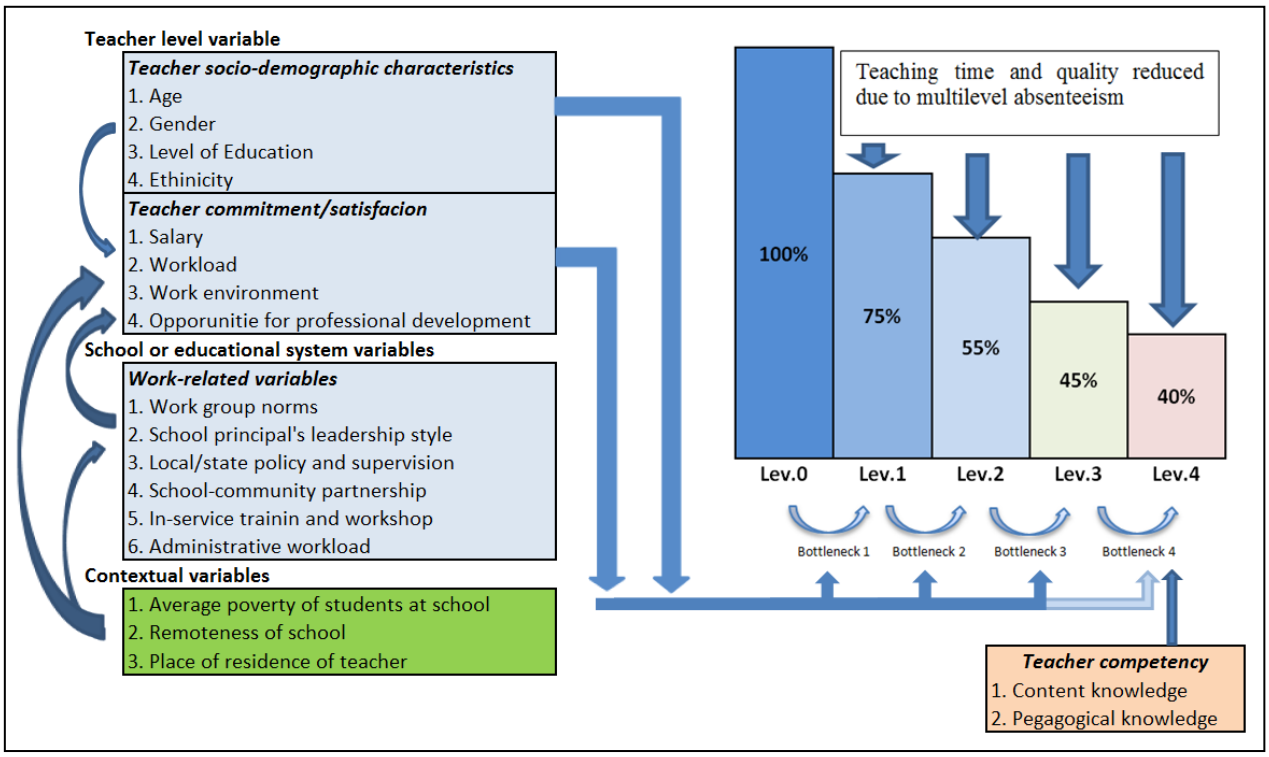
In this manner, the concept of multilevel teacher attendance helps us to classify and unpack the various bottlenecks to effective learning and establish explicit links between these bottlenecks and the level of attendance/absenteeism. The notion of multilevel teacher attendance has not been widely used in education sector analysis. Standard education sector analysis methods and various education simulation models use teacher-pupil ratio and share of qualified teachers to represent education human resources available for children, implicitly assuming that employed teachers would be in school spending time for educational activities with students.

Figure 1: Concept of multilevel teacher attendance (absenteeism)



The effectiveness of teacher management policies is likely to be heavily context-dependent, and so contexts need to be accounted for when assessing the independent impact of policies (and their transferability). Guerrero & EPPI-Centre (2012) reviewed various determinants of teacher absenteeism based on education, psychology, and sociology literatures, and proposed a model for teacher absenteeism with three levels of influence with the potential to affect teacher attendance/absenteeism: (i) teacher-level, (ii) school-level, and (iii) context-level variables. This project adopts the Guerrero & EPPI-Centre model with a modification (Figure 2). The modification is to add 'technical competency' of teachers, which has direct impact on students learning outcomes (Bold et al., 2017) and is hypothesised to strongly associate with marginal costs of teaching (i.e., competent teachers have lower marginal costs).

Figure 2: Proposed model for an ecology of teacher attendance/absenteeism



A systemic view of the extent and effectiveness of teacher management policies and practices, or their relationship with teacher absenteeism and educational outcomes in developing countries is not well understood. For instance, World Bank's SABER initiative on teacher management and results of SDI surveys show little correlation between policy provision for teacher termination based on absenteeism and actual teacher absent rates. This model will facilitate in untangling the relationship between legal/policy provisions at the national / local level, policy and practice at the school level, and the role of other system stakeholders at various levels (e.g. teachers' unions) on teacher attendance, to improve student outcomes, and helps us to analyse whether systemic frameworks in the education sector are coordinated to maximize the level 4 teacher attendance – and where this is not the case, what kind of policies should be developed, what kind of policy implementation gaps exist, and what kind of teacher management reforms are needed.

II. Objectives and selected research questions

The objective of this research project is to develop a knowledge base on the issue of teacher attendance and provide country-specific policy recommendations to improve teacher attendance and student achievement among project countries. This project will provide critical insights into the ecology of teacher attendance with a view to improving student achievement and is expected to have positive impacts on the work of UNICEF at the country level by providing practical insights in its programmatic work. More specifically, the objectives of the project are as follows:

- To understand the bottlenecks at individual teacher, school, and education sector levels, which prevents teachers from progressing toward higher levels of attendance;

- To identify system issues (e.g., policy gap, and policy implementation gaps at all levels) linked to identified bottlenecks and barriers for higher teacher attendance;

- To provide country-specific policy recommendations to improve teacher attendance as a means to improving student achievement in project countries;

- To develop regional knowledge base on teacher attendance policies through identified common challenges among the studies countries, and international good practices based on public service reforms (including health sector) for higher-quality service delivery; and

- To increase awareness among senior policy makers in developing countries, international education stakeholders, and researchers on the importance of teacher management policies, and integration of the issue into key national education strategic papers and discussions.

Research questions of the project are centred on unpacking the interactions between system, school, and teacher individual factors that promote or hinder teachers from achieving higher levels of attendance. Findings of barriers to, and bottlenecks between, different levels of attendance should be interpreted in relation to policy gaps, policy implementation gaps, and inhibitive practices in order to improve the entire education system by reducing teacher absenteeism as a means to boosting student achievement. Specific selected key research questions of the project include;

- What are the systemic factors that can lead teachers to be absent from the classrooms in various ways, and how these might be addressed in the long-term through reforms to systemic structures or practices by other system actors?

- What factors lead to implementation gaps in managing teacher absenteeism at various levels of the system? How can they be addressed?

- What are the most promising practices for cross-country learning when designing teacher management policies, focusing on teacher attendance and teacher motivation?

III. Research design

To understand the bottlenecks that shape the ecology of teacher attendance and provide specific policy recommendations, the project will implement a qualitative research design in twelve countries in sub-Saharan Africa, namely, Ghana, Gambia, Liberia, Nigeria, Mauritania, Côte d'Ivoire, Niger, Gabon, Guinea, Central African Republic, Togo and Guinea-Bissau. In each participating country, a purposive sample of 20 schools will be examined.

County selection has been carried out based on consultation with UNICEF regional advisors to ensure that countries with high magnitude of absenteeism will be included in the sample. School selection will be conducted following consultation with the UNICEF country offices and national counterparts (MoE representatives) to address country specific contextual factors (e.g. geography, conflict, socio-economic development etc.), while ensuring country-wide coverage.

Fieldwork in each country will take no more than 20 days. No data will be collected too close to school start or school end, i.e. when teacher absenteeism rates are typically the highest.

IV. Methodology

Data collection will be carried out through the following steps:

Desk review: A desk review will be conducted to collect secondary data on education and macroeconomic statistics along with national teacher management laws; relevant policy/strategy/planning documents developed around teacher absenteeism; relevant monitoring and evaluation frameworks; assessments of teacher absenteeism programmes; guidance documents; and results from previous studies and reports about absenteeism in the selected countries.

Semi-structured interviews: Data collection will also be carried out through face to face, semi-structured interviews with key education stakeholders at the national and local levels. This includes ministry and sub-national education officers, teachers, head teachers, students, and community leaders. Different questionnaires will be developed for each type of respondent. All, however, will aim at capturing the respondents' unique understanding of the drivers of teacher absenteeism and to gain insightful information on successful and ineffective policy approaches.

Following the proposed conceptual framework of the ecology of absenteeism that aims to analyse the relationship between policy implementation gaps, context and bottlenecks at various levels of teacher absenteeism, questionnaires will be designed as illustrated directly in Table 1 below.

Table 1: Qualitative questionnaire design

Bottlenecks between Levels of Teacher Absenteeism	***Factors that create teacher absenteeism***					
	System	**School/ manager**	**Teachers**	**Community**	**Students**	**Culture/ Norms/ Ethnicity**
L0 and L1						
L1 and L2						
L2 and L3						
L3 and L4						

Specifically, interviewees will first be asked about bottlenecks between level 0 and level 1, and will be requested to reflect on the factors that prevent teachers to achieve level 1 attendance. Factors will be systematized in thematic areas including system, school/management, teachers, community, students, and culture and norms. Once all potential drivers of absenteeism are investigated, the interviewer will move to questions on the bottlenecks between L1 and L2 attendance, and so on. This way, the relationship between issues raised by interviewees and types of bottleneck will be interpreted in relation to different levels of absenteeism in a systematic manner.

Paper-based survey: Finally, a short paper-based survey targeting teachers will be conducted, which will help create a link to the national patterns of teacher absenteeism. In addition, this will allow the detection of subnational patterns of absenteeism and of causal perceptions of absenteeism and provide important insights on the role of context in policy implementation.

Note on ethics: All sampling strategies and instrument administration processes are underpinned by strict ethical criteria, which ensure voluntary and consensual participation, the privacy and confidentiality, and the equitable representation of research subjects.

V. Ongoing initiatives and value added of current proposal

There have been considerable international efforts made to address the issue of teacher absenteeism. For example, the World Bank has been leading the study of teacher absenteeism through the SDI survey initiative, which quantifies the degree of teacher absenteeism at various levels among African countries, and the SABER initiative, which developed a comprehensive depository of teacher management policies ranging from teacher recruitment, pre-service teacher training, teacher promotion and deployment to teacher career development. These on-going initiatives provide a comprehensive overview for us to understand the degree of the

problem and policy environments surrounding the issue. These initiatives, however, have limited data to analyse the mechanism of the absenteeism taking multiple reasons beyond personal motivation of teachers to be present in school. This study proposes an approach with a wide lens by addressing structural questions such as salary level, corruption and capacity of management, and the capacity of supervision at various levels. The qualitative study of ecology of teacher attendance (absenteeism) not only complements on-going international efforts but also brings new insights on teacher attendance issues with specific policy recommendations to improve teacher attendance.

VI. Proposed operational arrangements

The project proposes to establish a steering group in order to ensure the quality of work and enhance partnership and complementarity on the issue of teacher attendance/absenteeism. The steering group will be comprised of representatives from the Office of Research UNICEF, UNICEF regional directors who supervise project countries, representatives from UNICEF Education Programme Division, and representatives from international stakeholders/partners (tasks are defined in section X). To implement the proposed project, four phases are envisaged.

Phase 1: Planning and inception. This stage consists of 1) formation of the project committee, 2) development of country-specific TORs, 3) inception meetings and training of trainers, 4) establishment of steering groups and ethics procedures, and 5) finalization of research instruments.

Phase 2: Data collection in studied countries, and drafting country reports. Qualitative data and other key data such as teacher management laws and macroeconomic statistics will be collected. National researchers would be mobilized to support the implementation of interviews, including finalizing interview schedule and translation of the interview instruments, if necessary. Collected data is sequentially analysed and country reports will be drafted.

Phase 3: Draft of the synthesis report. Findings of country reports are further analysed in order to tease out good practices, common challenges, and lessons learned. Additional data is collected and literature review is carried out to learn lessons from international examples of public service reforms including health sector. The synthesized report and country reports will be reviewed and endorsed by the project committee.

Phase 4: International conference. Results are disseminated through an international conference to share the findings and provide practical policy recommendations to improve teacher attendance.

VII. Outputs and deliverables

1. Country reports that summarize results based on qualitative research on teacher attendance, teacher management policies and practices from different systemic perspectives. The country reports provide a descriptive summary of teacher management policies and policy environments, including its recognition by the national education strategy, availability of periodical data, and political willingness to address the issue. The reports will also show the trends and patterns of teacher management policies. Furthermore, the reports will highlight policy gaps, legal gaps, and policy implementation gaps related to teacher absenteeism to tease out systemic factors that prevent/induce different types of teacher absenteeism, and reasons why. In addition, specific policy recommendations to improve teacher attendance will be provided.

   The country reports will be distilled from background documentation (working papers) and technical documentation related to survey instrument design and data collection processes, translation and validation.

   Each country in the project will have a report. Each country report will contribute to the synthesis reporting (drawing cross-regional lessons), along with a regional literature review.

2. There will be one regional syntheses report, speaking to the determinants of absenteeism across the region, and linking these determinants to the evidence base (including policy structures) around addressing bottlenecks and barriers to teacher attendance in different parts of the education systems. Evidence will include information on successful policies, successful reforms, behavioural nudges for motivation to teach and others. The synthesis report will include an assessment of the external validity of the evidence base, and preconditions to public policy transfers where opportunities arise. The synthesis report will be written around three sections:

   a. An analysis of current situation of teacher management policies using the SABER teacher policy database. In addition to the descriptive summary mentioned above, the linkage between teacher absenteeism and context of teacher management policies are analysed in detail to show the global/regional patterns of teacher management policies related to teacher attendance.

   b. International experiences of teacher and/or public servant reforms and practices, providing lessons learned for teacher management policies, especially around the implementation gaps. Evidence for this section will be drawn from Country reports (output 1).

   c. Recommendations for effective teacher management policy design, and recommended policies and mechanisms to fill the implementation gaps.

3. An international conference to disseminate the country and the synthesized report, inviting senior education stakeholders to increase awareness of the issue, share national practices, and discuss how to reduce teacher absenteeism and improve teacher motivation.

Note on academic output (journal articles): The project has been designed to speak to policy responses and implementation strategies to address teacher absenteeism and provide evidence directly into the hands of policy makers regarding a range of attributes and perspectives of the education system contributing to teacher absenteeism (including exogenous to the education system where these exist). The academic journal articles are not a prioritised output of the project. However, the research process will meet pre-defined quality assurance procedures (see section VII below), and all published output will be subject to rigorous peer review processes (country and synthesis reports – specific review steps to be guided by a steering committee, and to meet at a minimum UNICEF Office of Research guidelines).

VIII. Quality assurance procedures

Data instruments will be designed and reviewed with support of national steering groups / academic partners – the design will draw from existing instruments in the field and be written up as a methodological paper to be included in technical documentation. Qualitative instruments will:

- be translated and back translated and checked.
- undergo validation through a cognitive testing process with relevant education stakeholders (including teachers) in each country.
- be reviewed and discussed by national representatives as part of inception meetings.
- undergo ethics reviews (as will cognitive testing procedures).

The paper-based survey will:

- be translated and back translated and checked.
- be piloted in each country and tested for non-response bias, prior to roll-out.
- be reviewed and discussed by national representatives as part of inception meetings.
- undergo ethics reviews (as will cognitive testing procedures).

The paper-based survey and qualitative interviews will be cross-validated.

Desk research will validate all reported data to be used as evidence, check sources and validity of referenced studies, and cross check policy descriptions used in the country and synthesis reports to external / matched sources where possible.

Technical documentation will outline all methods processes and validation steps and be published alongside working papers and country reports.

Steering committee will help define a review process of drafts and documentation for publishing. Standard UNICEF Office of Research publication procedures require internal and external reviews (a minimum of three reviewers, reviewers sign-off and a review report).

IX. Timeline: 18 months

Please see table 2.

Phase 1: Planning and inception. July 2018 to October 2018

Phase 2: Data collection and drafting country reports. November 2018 to August 2019

Phase 3: Drafting the regional synthesised report. September to November 2019

Phase 4: International conference. December 2019

X. The research team and steering groups

The project will be led by Dominic Richardson, Senior Education Specialist, OoR, and two international consultants with consultation of international key partners, UNICEF regional and global education advisors. Participating UNICEF COs provide logistic supports in contacting and coordinating with the ministries of education and other local stakeholders.

Oversight of the project will be supported by an international steering group, and national steering groups as deemed necessary.

UNICEF Innocenti will also lead the all phases of the project, including the analysis of the data and drafting of the reports. All reports will undergo external academic review processes (reviewers will be selected by committee).

Additional academic support will be engaged at the national level in inception meetings and national steering committees (where these are requested) and consulted as part of the refinement of data collection instruments at the national level and included in the selection process in the case of commissions for data collection and translation. Both national and regional academics will be consulted / included in the review process of all output.

International academics (including from outside of the region) may be selected into the international steering group.

In the first instance, discussion between funders and the lead research team will define academic involvement in steering groups. Steering groups will then define academic involvement in all other parts of the research process. It is expected that funder groups would add their input at the international steering level, and national level for those countries to which funding is directed (this means involvement in inception meetings, national TOR development, input on national academic and research engagement, and dissemination).

Table 2: Anticipated action points and schedule

		Phase 1				Phase 2										Phase 3				Phase 4
		2018						2019												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Action points \ Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Research steps																				
Inception	Planning, inception meetings / national ToRs / establish steering groups / ethics procedures	■	■	■	■															
Desk research	Development of instruments (inc. translations), desk reviews	■	■	■	■															
Fieldwork	Hiring researcher teams and training		■	■	■	■														
	Data collection (interviews, focus groups and paper-based surveys)					■	■	■	■	■	■									
	Data cleaning / validation / translation						■	■	■	■	■	■								
Country reporting	Draft country reports							■	■	■	■	■	■	■						
	Finalizing country reports											■	■	■	■					
Regional reporting	Data collection and literature review													■	■	■				
	Drafting regional report															■	■			
	Finalizing regional report																■	■		
International conference																			■	

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Annex 1: Teacher absenteeism in African countries

	All	Kenya	Mozambique	Nigeria	Senegal	Tanzania I	Tanzania II	Togo	Uganda
Absence from class (%)	44	48	56	23	31	53	47	40	57
Absence from school (%)	23	15	45	17	16	23	15	23	28
No. of teachers	16543	2311	991	2968	1222	1740	3518	776	3017
Scheduled teaching time	5h 27m	5h 36m	4h 21m	4h 43m	4h 36m	5h 47m	5h 55m	5h 24 m	7h 13m
Time spent teaching	2h 49m	2h 31m	1h 43m	3h 10m	3h 5m	2h 32m	3h 16m	3h 9m	3h 2m
No. of schools	2001	238	200	435	145	176	344	144	319
Orphaned classrooms (%)	33	38	31	26	-	-	36	24	45
No. of schools	1647	234	150	430	-	-	392	127	314

Notes: The table reports the absence rate for all teachers, the scheduled teaching time, actual teaching time and number of orphaned classrooms for all government schools. Teachers are marked as absent from school if during the second unannounced visit, they are not found anywhere on the school premises. Otherwise, they are marked as present. Teachers are marked as absent from class if during the second unannounced visit, they are absent from school or present at school but absent from the classroom. Otherwise, they are marked as present. The scheduled teaching time is the length of the school day minus break time. Time spent teaching adjusts the length of the school day by the share of teachers who are present in the classroom, on average, and the time the teacher spends teaching while in the classroom. The orphaned classrooms measure is the ratio of the classrooms with students but no teacher to the number of classrooms with students with or without a teacher. All individual country statistics are calculated using country-specific sampling weights. The average for all countries is taken by averaging over the country columns. Hence, each country is given equal weight. Further details on the construction of the variables and sampling weights are available in an Appendix available from the authors upon request.

Source: Bold et al. (2017).

Annex 2: Wasted investment: the public cost of teacher absenteeism

Teachers and school staff represent the most significant point at which the efforts of an education system are transferred directly to school children. Teacher absenteeism, therefore, undermines the investments made at preceding points of the education system, and reduces the efficiency of subsequent investments.

To estimate the wastage associated with teacher absenteeism, Table 1 approximates the financial cost of lost teaching time from the annual education budget in 5 African countries. Estimates of lost teaching time are taken from the Service Delivery Indicators (SDI) survey that showed – after accounting for school, classroom, and time-not-teaching in class – that teachers in the survey countries were, on average, teaching for just under 3 hours out of a contracted 5.5 hours per day (Filmer, 2015). Across all of the SDI countries, this loss of teaching hours can be presented as a waste of approximately 0.46 cents in every dollar invested.

To interpret the information presented in Table 2, take the case of Mozambique, a country with a GDP of approximately 12 billion USD dollars per year, 6.6% of which is spent on education. In real terms, this 6.6% of GDP amounts to an education budget of 792 million USD per year. If each year 46% of the educational efforts in Mozambique are lost due to teacher absenteeism, this amounts to total annual wastage costs of approximately 367 million US dollars, or 3.1 percent of GDP.

Table 3: The cost of teacher absenteeism in selected African countries, circa 2013

	GDP in billions (USD PPP)	*Education budget as a proportion of GDP*	*Education budget in millions (USD PPP)*	*Waste in millions (USD PPP)*	*Wastage in national GDP*
Mozambique	12.0	6.6	792.0	367.2	3.1
Senegal	11.7	5.6	655.2	303.8	2.6
Tanzania	29.0	3.5	1015.0	470.6	1.6
Togo	3.0	4.4	132.0	61.2	2.0
Uganda	16.4	2.2	360.8	167.3	1.0

Note: Reported GDP figures from the WDI dataset have been rounded.

Source: Filmer, 2015 and World Development Indicators, 2015.

Although these estimates are crude and do not account for important adjustments (e.g. where children may be benefiting from being in school and having access to its resources out of 'teaching time', and cost factors associated to economies of scale) they are indicative of the enormous cost of teacher absenteeism. To put it in context, the level of waste, in GDP, reported in Table 1, would pay for the costs of comprehensive suite of family benefit policies equivalent to those seen in developed countries (around 1 to 4% of GDP, OECD, 2011), or cover the costs of the universal childcare system equivalent to those seen in northern Europe (around 2% of GDP, OECD, 2011).

Annex 3: Regression results

	Teacher absence (1 = Teachers are often absent)					
	All countries		By individual country			
	No country effects	With country effects	Kenya	Mozambique	Nigeria	Uganda
Demographics						
age	−0.005***	−0.004***	0.0005	−0.012**	−0.010	0.001
	(0.001)	(0.001)	(0.006)	(0.006)	(0.010)	(0.005)
urban	0.159***	0.196***	0.124	0.578***	−0.157	−0.648**
(1 = urban)	(0.037)	(0.039)	(0.182)	(0.154)	(0.266)	(0.290)
male	0.261***	0.257***	0.106	0.286**	0.385*	0.180
(1 = male)	(0.035)	(0.035)	(0.156)	(0.136)	(0.225)	(0.123)
Socioeconomic Status						
current condition	0.116***	0.186***	−0.122	0.140	−0.295	0.058
(1 = Very bad, 0 = Others)	(0.044)	(0.046)	(0.168)	(0.255)	(0.341)	(0.137)
condition compared to others	0.213***	0.160**	0.154	0.929***	−0.163	0.403***
(1 = Much worse, 0 = Others)	(0.061)	(0.063)	(0.229)	(0.224)	(0.486)	(0.142)
Discrimination by Ethnicity						
sometimes	0.228***	0.259***	0.027	0.593***	0.245	0.198
(1 = Yes)	(0.042)	(0.045)	(0.196)	(0.169)	(0.345)	(0.156)
often	0.408***	0.421***	0.201	0.737***	1.094***	0.053
(1 = Yes)	(0.053)	(0.056)	(0.233)	(0.194)	(0.349)	(0.189)
always	0.526***	0.588***	0.641***	0.494*	0.750*	0.688***
(1 = Yes)	(0.061)	(0.064)	(0.220)	(0.275)	(0.409)	(0.207)
Constant	−1.834***	−1.844***	−1.939***	−1.198***	−3.109***	−1.193***
	(0.057)	(0.104)	(0.402)	(0.313)	(1.118)	(0.271)
Observations	26,006	26,006	1,394	1,456	1,228	1,501
Log Likelihood	−11,227.120	−10,726.860	−558.941	−699.488	−293.909	−826.235
Akaike Inf. Crit.	22,484.240	21,537.720	1,157.882	1,440.975	679.817	1,678.470

Note: Controlled for race effects. Controlled for geographic region effects in regressions by individual country.

*p<0.1; **p<0.05; ***p<0.01