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HUMAN RESOURCES PRODUCTIVITY IMPROVEMENT IN ZAMBIA

June 2011

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HEALTH SYSTEMS 20/20

Mission

The Health Systems 20/20 **cooperative agreement,** funded by the U.S. Agency for International Development (USAID) for the period 2006-2011, helps USAID-supported countries address health system barriers to the use of life-saving priority health services. Health Systems 20/20 works to strengthen health systems through integrated approaches to improving financing, governance, and operations, and building sustainable capacity of local institutions.

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CONTENTS

Acronyms ..... **vii**

Acknowledgments ..... **ix**

Executive Summary ..... **xi**

1. Background **1**

1.1 Human Resources For Health in Zambia 1
1.2 Steps in the Participatory Human Resource Productivity Improvement Process 2
1.3 Objective and Scope 3

2. Methods **5**

2.1 Sampling Methodology 5
2.2 Data Collection Procedures 8

3. Results **11**

3.1 Observations of Health Care Workers 11
3.2 Baseline and Endline Results from Interviews with Health Care Workers 15
3.3 Interviews with Facility Directors 19
3.3.1 Facility-Level Impacts 21
3.3.2 Individual-Level Impacts 22
3.3.3 Patient and Community-Level Impacts 25

4. Key Implications **27**

References **29**

LIST OF TABLES

Table 1: Health Facilities in the Sampled Provinces 5
Table 2: Number of Staff Cadres Directly Involved in Patient Care in Public Health Institutions in the Selected Districts in 2006/07 6
Table 3: Sample Allocation in the Selected Districts by Facility and Staff Cadre, Baseline Survey (2009) 7
Table 4: Sample Allocation in the Selected Districts by Facility and Staff Cadre, Endline Survey (2010) 7
Table 5. Mean Productivity by Cadre in Intervention Districts at Baseline and Endline 12
Table 6. Health Workers Reporting Receiving Written or Oral Job Descriptions, at Baseline and Endline 15
Table 7. Supervisory Support: Frequency and Benefit for Patient Care 16

Table 8. Health Workers Reporting Receiving on-the-Job Training, and Health Workers' Perception of Impacts of on-the-Job Training on the Provision of Health Services....17
Table 9. Health Workers Reporting Drug and Supplies Stock-Outs and Health Workers' Perception of Impact of Stock-Outs on Service Delivery....18
Table 10. Proportion of Health Workers Reporting Inadequate Equipment and Instruments and Perceived Impact on Service Delivery....18
Table 11. Interventions Implemented, by Facility....19
Table 12. Summary of Impacts Detailed by Facility Directors, by Intervention....20

LIST OF FIGURES

Figure 1a: Mean Distribution of Time by Cadre (intervention districts at baseline and endline)....12
Figure 1b: Mean Distribution of Time by Cadre (intervention and comparison districts at endline)....13
Figure 2a: Time Spent on Direct Patient Care by Day and Facility (in intervention districts at baseline)....14
Figure 2b. Time Spent on Direct Patient Care by Day and Facility (in intervention districts at endline)....14
Figure 3: Time Spent on Productive Work by Day at Endline....15

ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
DMO	District Medical Officer
HIV	Human Immunodeficiency Virus
HSSP	Health Services and Systems Program
MOH	Ministry of Health
OPD	Outpatient Department
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

Shortages of human resources for health are a major constraint to the sustainable expansion of health service delivery. This is an especially difficult challenge in countries with high HIV prevalence. Zambia in particular faces the twin challenges of a high HIV burden (adult prevalence of 15.2 percent) (UNAIDS 2008) and an acute health worker shortage. Health Systems 20/20, in collaboration with the Health Services and Systems Program and the Zambian Ministry of Health (MOH), implemented a demonstration project to explore the effectiveness of a stakeholder-driven participatory productivity improvement process. The main steps in this process were the following:

- Step 1: Build consensus on the technical approach for the participatory productivity improvement process by bringing together various stakeholders to finalize the approach (February 2009);
- Step 2: Conduct a baseline assessment at health facilities to collect information on how HIV/AIDS health care providers spend their time (patient care, administrative work, down time, etc.) and related information on patient loads and available support (equipment, supplies, supervisory visits, and training) essential to facilitate productivity (February-April 2009);
- Step 3: Implement the participatory productivity improvement process by bringing together key national-level decision makers and clinical staff to identify and implement facility-level interventions and subsequent action plans (October 2009);
- Step 4: Conduct midterm monitoring of facility-level interventions to gauge problems and progress with implementation (March 2010); and
- Step 5: Conduct an endline assessment in all facilities to collect similar information as the baseline assessment and interview facility directors in the intervention facilities to gather more information related to implementation (November-December 2010).

The study sought to address whether the interventions selected through the productivity improvement process were easy to implement and whether the selected interventions improved productivity. Central, Eastern, North Western, and Northern provinces were included in this activity. These provinces were then paired based on similarities in HIV prevalence, poverty headcounts, and number of health professionals per 10,000 individuals. One province from each pair was randomly selected to implement the productivity improvement intervention. Based on these criteria, Central (intervention) and Eastern (comparison) provinces formed the first pairing and Northern (intervention) and North Western (comparison) province formed the second pairing. Three district hospitals were selected at random from each province for a total sample of 12 district hospitals.

There are eight major classifications of health care professionals as defined by the MOH: medical doctors (general physicians or specialists); clinical officers; nurses; midwives; environmental health officers or technicians; pharmacists; laboratory technicians; and others. To be eligible for this activity, staff needed to have a direct patient care-giving role and provide at least some HIV/AIDS-related health services. At baseline, 93 staff members (2 medical doctors, 12 clinical officers, 54 nurses, and 25 midwives) were selected for the intervention provinces and 96 staff members (2 medical doctors, 12 clinical officers, 68 nurses, and 14 midwives) were selected for the comparison provinces. At endline, 100 staff members were selected for both intervention (8 medical doctors, 18 clinical officers, 43 nurses, and 31 midwives) and comparison (8 medical doctors, 21 clinical officers, 49 nurses, and 22 midwives) provinces.

Three types of data were collected for this activity: (1) health care worker outputs to determine the time allocations between productive time (e.g., patient care, consulting with staff on follow-up for patients, outreach, administration, meetings, seminar or workshop, training, and cleaning/preparation/personal hygiene) and nonproductive time (e.g., own illness, illness of others, funeral, formal holiday, collecting salary, unexplained absence, social visits or contacts, break, and waiting for patients); (2) health worker interviews to assess perceptions of their roles, supervisory and other work-related support received and perceptions of constraints to optimum productivity; and (3) facility director interviews were conducted at endline to gain insight into their perceptions of the effects of the interventions and their views on the ease of implementing interventions.

Baseline and endline data collected from health workers through observation and in-depth interviews reveal that:

- At endline, doctors, nurses, and midwives spent the majority of their days engaged in productive activity; however, only 28 percent (doctors) to 50 percent (nurses) of their days are spent on direct patient care. This suggests the importance of increasing time spent on direct patient care across cadres.
- From baseline to endline, time spent on productive patient care increased for nurses and midwives.
- From baseline to endline, time spent on productive patient care decreased for clinical officers. Reasons for this decrease are not clear. There is room to increase the amount of time that clinical officers spend on productive patient care activities.
- Health workers report equipment, drugs, and supply shortages that they believe impact the quality of services (both HIV- and non-HIV-related) provided to patients.
- Health workers believe that on-the-job training and external supervision are important tools for improving patient care and perceive that more on-the-job training is needed to optimize their ability to deliver health services.
- Lack of resources and time were the two key obstacles faced in implementing productivity improvement interventions; staff resistance was minimal.
- Two interventions, the code of conduct and resource pool interventions, could be implemented relatively easily in a wider range of facilities.
- Interventions generated changes at three levels: (1) Facility-level changes included a more organized workspace, enhanced human resource management, increased utilization of staff time on patient care, and maximization of staff skill mix across units; (2) Individual-level changes included reduced absenteeism and tardiness, development of use of new skill sets, increased motivation, and increased accountability; and (3) Patient/community-level changes included fewer patient complaints and increased uptake of health facility services by the community.

This report summarizes key findings of the stakeholder-driven participatory productivity improvement process. Rather than acting as a stand-alone resource, the highlights presented in this report are meant to shed light on how a participatory process of problem diagnosis can be used to develop productivity improvement interventions. The results of the study also shed light on which interventions may be most appropriate and effective for improving productivity within the Zambian context, and could be implemented on a wider scale within the country.

1. BACKGROUND

The chapter provides some context on Zambia's human resources for health, in terms of numbers, skills, and other factors. It also provides an overview of the scope, objectives, and steps of the human resource productivity improvement process for this demonstration project.

1.1 HUMAN RESOURCES FOR HEALTH IN ZAMBIA

Shortages of human resources for health are a major constraint to the sustainable expansion of health service delivery. This is an especially difficult challenge in high HIV-burden countries. Zambia in particular is faced with the twin challenges of a high HIV burden (adult prevalence of 15.2 percent) (UNAIDS 2008) and an acute health worker shortage. Recent estimates suggest that Zambia has about half the health workforce that it needs (Schatz 2008) with fewer than 646 doctors and 6,096 nurses for a population of about 12 million (MOH 2005).

The number of health worker posts filled only tells part of the human resources for health story. If effective health services are to be delivered, competent and productive health workers must be available. To date, there has been no systematic direct measurement of health worker productivity in Zambia. However anecdotal evidence suggests that, on average, productivity is likely to vary by type of health worker and health facility. For instance, a recent Ministry of Health (MOH) report from a survey of health suggests that if self-reported levels of absenteeism and tardiness were to be eliminated from Zambia's public sector health facilities, Zambia would gain an equivalent of 187 full-time staff facilities (MOH et al. 2006). Staff retention is also an important problem, especially in remote and rural facilities (MOH et al. 2006). Attrition rates among health personnel – especially doctors and nurses – have been increasing over time. In fact, the number of doctors in Zambia declined by 56 percent between 1999 and 2002 with emigration and death (often related to HIV/AIDS) as the most frequently cited reasons (PHR*plus* 2005). In this context, helping existing workers to be as productive as possible is an important strategy to help alleviate human resource constraints to expanding the delivery of essential services in Zambia.

There is a clear need to identify and implement appropriate evidence-based yet simple processes by which health facilities can work to increase their own productivity in Zambia. Interventions to increase productivity based on nonfinancial incentives are especially relevant to low-income countries like Zambia, which are faced with the challenge of expanding service delivery despite resource constraints. In such settings, generating the additional resources required for financial incentives may be difficult in the short term, thus increasing the attractiveness of strategies that harness nonfinancial incentives. This underscores the importance of generating evidence on how nonfinancial incentives affect health worker productivity in Zambia as a prelude to larger-scale implementation if the evidence merits this decision (Dieleman and Harnmeijer 2006).

Existing studies have shown that stakeholder participation is an important design feature that increases the likelihood of success for strategies focused on improving health worker performance (Dieleman and Harnmeijer 2006). Stakeholder participation may be a particularly important determinant of success for strategies that rely on nonfinancial incentives since the incentives need to be tailored to health workers' perceived priorities.

Health Systems 20/20, in collaboration with the Health Services and Systems Program (HSSP) and the Zambian MOH, therefore implemented a demonstration project to explore the effectiveness of a participatory productivity improvement process in Zambia.

1.2 STEPS IN THE PARTICIPATORY HUMAN RESOURCE PRODUCTIVITY IMPROVEMENT PROCESS

Health Systems 20/20 worked with the Zambian MOH, HSSP, and other national and local stakeholders to identify appropriate interventions for improving health worker productivity using nonfinancial incentives; to implement the interventions; and to assess the effect of these productivity improvement interventions on staff output. This section describes the main steps involved in the productivity improvement process.

Step 1: Build consensus on the technical approach for the Participatory Human Resource Productivity Improvement Process

Health Systems 20/20 worked with the Zambian MOH and other stakeholders to finalize the approach to be implemented. Technical approach details were finalized during the consensus-building process in February 2009.

Step 2: Conduct a baseline assessment in all facilities included in the study

Through direct observation, or time-and-motion studies, the research team collected baseline data showing how HIV/AIDS health care providers in 12 district hospitals (six "intervention" and six "comparison" facilities) spent their time (patient care, administrative work, down time, etc.). During the baseline, the team also collected related information on patient loads and available support (equipment, supplies, supervisory visits, and training) essential to facilitate productivity. Finally, the team gathered data on human resource costs at the selected facilities. Data collection was carried out in February–April 2009 and data were analyzed to gauge baseline levels of productivity.

Step 3: Implement the Participatory Human Resource Productivity Improvement Process

In October 2009, Health Systems 20/20 brought together key national-level decision-makers and clinical staff from six intervention district hospitals in Central and Northern provinces (the intervention provinces) to a workshop in Lusaka. The workshop had two purposes: 1) to present results from the aforementioned baseline assessment and 2) using root cause analysis techniques, to identify facility-level interventions and subsequent action plans that the hospitals could carry out themselves, which would increase worker time spent on patient care.

At the end of the workshop, the following five interventions were identified by workshop participants to increase time spent on patient care at their own facilities:

- Intervention 1: Disseminating and operationalizing a code of conduct at the district hospital to reduce absenteeism.
- Intervention 2: Defining (where necessary) and disseminating job descriptions and responsibilities for outpatient health workers and support staff to clarify performance expectations.
- Intervention 3: Creating a resource pool of individuals with high-demand skills who can be redeployed across units based on patient care needs, and intensifying supervision of redeployed staff.
- Intervention 4: Improving health worker capacity (management training, skills for task-shifting).
- Intervention 5: Training supervisors and subordinates in facilitative supervision and staff management.

Each of the six intervention hospitals selected one or more of the five interventions and began implementation shortly after the October workshop. The project provided an on-call consultant whom the facilities could contact if they had questions or became stuck during implementation of interventions.

Step 4: Conduct mid-term monitoring of implementation

Mid-term monitoring was conducted during March 2010 to gauge problems and progress with implementation. Five of the six hospitals implemented interventions 1 and 2 (code of conduct and job descriptions). Half selected intervention 3 (staff resource pooling). Intervention 4 (improving core competencies) was chosen by two hospitals. Intervention 5 (supervisor/supervisee training) was chosen by three hospitals. One hospital implemented all five interventions.

Key informants from all facilities perceived that implementation had resulted in some progress. Some of these positive results included:

- Improved staff attitudes as staff knew their responsibilities and roles and potential consequences
- Flexible allocation of staff across units in response to variability in patient load, reducing idle time and over-work for clinical health workers and wait time for patients
- Improved team work and ability to shift tasks to nonclinical staff
- Fewer patient complaints

Step 5: Conduct an endline assessment in all facilities included in the study

During November-December 2010, Health Systems 20/20 conducted an endline assessment in all 12 district hospitals. Endline data collection procedures and instruments were similar to baseline, and productivity levels were analyzed in the hospitals at the two points in time (pre- and post-intervention). In-depth interviews were conducted with the facility directors in the six intervention facilities to gather more information related to the interventions they had implemented.

1.3 OBJECTIVE AND SCOPE

This demonstration project sought to determine if a stakeholder-driven participatory process could empower health workers in public sector facilities to improve conditions affecting their productivity, thereby increasing the amount of time they spend on patient care and other activities required to deliver good patient care. The activity concentrated on nonfinancial incentives/solutions that could be implemented by health workers themselves, so as to require minimal additional resources and offer maximum sustainability as a productivity-improvement model.

The objective of this report is to summarize baseline and endline assessment results in the 12 district hospitals and to determine whether improvements in productivity occurred after implementation of the intervention(s) in the six intervention facilities. In addition, the report examines qualitative data collected from facility directors about impact and the ease of implementation of the activities to determine whether replication in other locations would be feasible or whether modifications to the activities should be considered.

2. METHODS

2.1 SAMPLING METHODOLOGY

Four rural provinces were identified for inclusion in the human resources productivity improvement activity in consultation with the MOH: Central, Eastern, North-Western, and Northern provinces. By limiting the activity to four rural provinces, the sampling strategy eliminated the introduction of bias due to differences between urban and rural facilities. The sampling methodology also allowed for the identification of anomalies unique to specific districts or provinces.

These provinces were then paired based on similarities in HIV prevalence, poverty headcounts, and number of health professionals per 10,000 individuals. Using these criteria, Central Province and Eastern Province were matched; Northern Province and North-Western Province formed the second pairing. One province from each pair was randomly selected to implement the productivity improvement intervention, i.e., to be part of the intervention group. The Northern and Central provinces were selected for inclusion in the intervention group. The Eastern and North-Western provinces formed the comparison group. Following the baseline survey, productivity improvement interventions were implemented in selected facilities in the two intervention provinces.

Study facilities, three per province, were selected at random from among district hospitals. Level-1 hospitals are not located in all districts of a province; some districts only have higher-level hospitals (levels 2 or 3). The distribution of all eligible hospitals in the sampled provinces is detailed in Table 1, with the 12 selected hospitals indicated by an asterisk (*). The intervention group comprised the six selected hospitals in Northern and Central provinces and the comparison group comprised the six selected hospitals in Eastern and Northwestern provinces.

TABLE 1: HEALTH FACILITIES IN THE SAMPLED PROVINCES

Province	District	Hospital	Number of Beds	Number of Cots
Central	Chibombo	Liteta Hospital	90	10
	Kapri Mposhi	Kapiri Mposhi Hospital*	60	0
	Mkushi	Mkushi Hospital*	47	25
	Mumbwa	Mumbwa District Hospital	59	17
	Serenje	Chitambo Hospital*	100	5
		Serenje District Hospital	65	2
Eastern	Chama	Chama hospital	60	5
	Lundazi	Lundazi District Hospital*	110	8
	Nyimba	Nyimba Hospital*	68	5
	Petauke	Petauke District Hospital*	121	20
Northern	Chinsali	Chinsali Hospital	99	4
	Isoka	Isoka District Hospital*	72	6
	Mpika	Mpika District Hospital*	108	6
	Mporokoso	Mporokoso Hospital*	112	9
	Luwingu	Luwingu District Hospital	83	0
North-Western	Kabompo	Kabompo District Hospital*	80	16
	Mufumbwe	Mufumbwe Hospital*	48	7
	Mwinilunga	Mwinilunga District Hospital*	80	10
	Zambezi	Zambezi District Hospital	102	8

Source: Ministry of Health, Republic of Zambia 2005

*Indicates district hospitals selected for this activity.

The MOH defines eight major classifications of health care professionals: medical doctors (including general physicians or specialists); clinical officers (including assistant medical officers); nurses; midwives; environmental health officers or technicians; pharmacists; laboratory technicians; and others, defined as not classified, such as physiotherapists and radiologists. The most recent documentation of existing cadres occurred in 2006/07 (Table 2).

TABLE 2: NUMBER OF STAFF CADRES DIRECTLY INVOLVED IN PATIENT CARE IN PUBLIC HEALTH INSTITUTIONS IN THE SELECTED DISTRICTS IN 2006/07

Province	District	Medical Doctors	Clinical Officers	Certified/ Registered Nurses	Certi-fied/ Registered Midwives	Total Staff
Intervention provinces						
Central	Kapiri Mposhi	2	14	98	47	161
	Mkushi	1	10	46	13	70
	Serenje	2	9	36	17	64
	Sub-total	5	33	180	77	295
Northern	Isoka	2	3	14	28	47
	Mpika	5	9	63	26	103
	Mporokoso	1	9	23	6	39
	Sub-total	8	21	100	60	189
Total in intervention provinces		**13**	**54**	**280**	**137**	**484**
Comparison provinces						
Eastern	Lundazi	1	10	69	23	103
	Nyimba	1	16	27	9	53
	Petauke	4	25	144	32	205
	Sub-total	6	51	240	64	361
North-Western	Kabompo	1	6	33	5	45
	Mufumbwe	0	2	23	2	27
	Mwinilunga	4	5	59	2	70
	Sub-total	5	13	115	9	142
Total in comparison provinces		**11**	**164**	**355**	**73**	**503**

Sources: MOH human resources information system database for 2006
Districts' human resources registers for 2007

At both baseline and endline, researchers determined for each facility which staff were eligible for participation in the study by compiling a list of all staff not on leave during the planned data collection week at that facility. The list was compiled by someone at the district hospital prior to the arrival of researchers and/or by the research team in conjunction with district hospital staff upon arrival in the district. Information was collected by cadre. To be eligible to be listed, staff had to have a direct patient care-giving role and provide at least some HIV/AIDS-related health services. Staff were not eligible for participation if their shift began on a day other than Monday. Other exclusion criteria included the provision of inpatient services during the research period. Selection of staff from among those names appearing on the list was done systematically. The number of staff selected at each district by cadre is detailed in Table 3 (baseline)[1] and Table 4 (endline)[2].

[1] Baseline: Assuming that after interventions the overall time used productively would improve to 80 percent in the intervention group but remain at 60 percent in the control group, 93 cases in the intervention group and 93 cases in the control group would provide a power of 85 percent to detect the differences due to productivity interventions with 95 percent confidence. The sample was proportionally allocated based on staffing distribution from Table 2.

TABLE 3: SAMPLE ALLOCATION IN THE SELECTED DISTRICTS BY FACILITY AND STAFF CADRE, BASELINE SURVEY (2009)

Province	District	Medical Doctors/ Physicians	Clinical Officers/ Assistant Medical Officer	Certified/ Registered Nurses	Certified/ Registered Midwives
Intervention provinces					
Central	Kapiri Mposhi	1	3	19	9
	Mkushi	0	2	9	2
	Serenje	0	2	7	3
Northern	Isoka	0	1	3	5
	Mpika	1	2	12	5
	Mporokoso	0	2	4	1
Total in intervention provinces		**2**	**12**	**54**	**25**
Comparison provinces					
Eastern	Lundazi	0	2	13	4
	Nyimba	0	3	5	2
	Petauke	1	5	28	6
North-Western	Kabompo	0	1	6	1
	Mufumbwe	0	0	4	0
	Mwinilunga	1	1	11	0
Total in comparison provinces		**2**	**12**	**68**	**14**

TABLE 4: SAMPLE ALLOCATION IN THE SELECTED DISTRICTS BY FACILITY AND STAFF CADRE, ENDLINE SURVEY (2010)

Province	District	Medical Doctors/ Physicians	Clinical Officers/ Assistant Medical Officer	Certified/ Registered Nurses	Certified/ Registered Midwives
Intervention provinces					
Central	Kapri Mposhi	1	5	15	10
	Mkushi	1	3	7	3
	Serenje	1	3	6	4
Northern	Isoka	1	1	2	6
	Mpika	3	3	9	6
	Mporokoso	1	3	4	2
Total in intervention provinces		**8**	**18**	**43**	**31**
Comparison provinces					
Eastern	Lundazi	1	3	9	7
	Nyimba	1	5	4	3
	Petauke	2	9	20	9
North-Western	Kabompo	1	2	5	1
	Mufumbwe	0	1	3	1
	Mwinilunga	3	1	8	1
Total in comparison provinces		**8**	**21**	**49**	**22**

[2] Endline: a sample of 100 in the intervention and 100 in the comparison group was desired. The sample in each category in each province was allocated to each district in proportion to the number in the population in that district with the requirement that at least one person be allocated to each category in each district

2.2 DATA COLLECTION PROCEDURES

The following data were collected:

a. Health care worker outputs: At baseline and endline, data collectors documented health workers' time allocations between productive time and nonproductive time. Productive time includes time spent on providing patient care and other activities necessary to provide patient care, such as completing patient records and disinfecting. Nonproductive time includes unexplained absences, breaks, or idle time spent waiting for patients. This information was collected for selected health care workers for a period of five consecutive working days (Monday to Friday).
b. Health worker interviews: To ascertain health workers' role, health workers' perceptions of their roles, supervisory and other work-related support received and perceptions of constraints to optimum productivity, an in-depth interview was conducted with each selected health care worker during the week in which the ongoing observation of their activities occurred (at both baseline and endline).
c. Facility director interviews: At endline, we conducted an in-depth interview with each of the facility directors in the six intervention facilities to gain insight into their perceptions of the effects of the interventions.

The supervisor of each facility was asked to sign a consent form prior to the initiation of staff recruitment. The study procedure was explained to the supervisor after obtaining consent to participate. Informed consent was obtained from each health care worker prior to observing time usage or conducting an interview. The staff were informed of the study objectives and protocol; only after workers signed a consent form were they interviewed and observed by research staff. To maintain participant confidentiality, all documents were identified using a facility and staff code; participants were not identified by name on study documents. Research staff were trained in appropriate interview and observation techniques prior to beginning data collection.

Participating health care workers were observed during their working hours to determine time usage. Research staff arrived at the hospital prior to the beginning of the workers' shifts to document any possible tardiness. The data collectors observed the workers' day, recording activities and time expended. Based on observation, data collectors classified all activities as one of the following:

Productive time

1. Patient care: Any time spent providing services to or examining patients, filing records for a specific patient, or reviewing charts of a specific patient.
2. Consulting with staff on follow-up for patients: Any time spent away from patient during clinic hours to follow-up on procedure, laboratory results, or equipment required for patient care for a specific patient.
3. Outreach: Any time spent providing health services to patients from a lower-level public sector facility.
4. Administration: Time spent on managing service delivery from the facility and the duration the interview.
5. Meetings: Official meetings with staff from within or external to the facility, seminars, or workshops other than those whose explicit purpose is skills building or training.
6. Seminar or workshop: Seminar or workshop for a purpose other than skills building or training for example, report writing and strategy development.
7. Training: Any time spent on officially required training at a workshop, seminar, or training.

8. Cleaning/preparation/personal hygiene: Sterilizing instruments, cleaning facility, cleaning or preparing for activities directly related to providing patient care.

Nonproductive time

1. Own illness: Absence due to illness of self.
2. Illness of others: Absence due to illness of others.
3. Funeral: Absence to attend a funeral.
4. Formal holiday: Official holidays.
5. Collecting salary: Time spent to collect salary within or outside the district.
6. Unexplained absence: Absence for unexplained reason.
7. Social visits or contacts: Time spent away from the facility for social visits.
8. Breaks: Time spent relaxing, e.g., tea break, lunch break, or bathroom break.
9. Waiting for patients: Idle time spent waiting for patients.

Other

1. Other: Time that does not fall into any of these categories.

3. RESULTS

3.1 OBSERVATIONS OF HEALTH CARE WORKERS

Six intervention hospitals from the Northern and Central provinces contributed information on 215 person-days of observation at baseline. A total of 43 health care workers were observed in the intervention districts, including 1 doctor, 12 clinical officers, 19 registered nurses, and 11 midwives. The mean age of those interviewed was 41.6 with an average of 13.7 years of experience; 47 percent of the health care workers interviewed were female. A total of 16 health care workers were observed in the comparison facilities.

At endline, a total of 45 health care workers were observed in the intervention districts, including 7 doctors, 13 clinical officers, 11 nurses, and 14 midwives, representing a total of 225 person-days of observation. Another 61 health care workers (7 doctors, 19 clinical officers, 24 nurses, and 11 midwives) were observed in the comparison districts, representing 305 person-days of observation. The mean age of those interviewed was 40.8 years with an average of 12.7 years of experience, and 48 percent were female.

On average, at baseline all health workers in the intervention group sites were productive for 5.2 hours per day; this represents 68 percent of the time spent at work. The 5.2 hours were divided into 3.1 productive patient care hours and 2.1 productive nonpatient care hours. The remaining 2.2 hours (29 percent of all time) were spent engaged in a nonproductive manner. At endline, all health workers in the intervention group sites were productive for 5.5 hours per day (61 percent of the time spent at work). Those productive 5.5 hours per day were divided into 3.6 productive patient care hours and 1.9 productive nonpatient care hours.

Mean hours of productivity at baseline and endline in the intervention facilities are displayed by cadre in Table 5. Information on doctors' productivity at baseline was redacted as only one doctor provided productivity information at baseline in the intervention facilities. Clinical officers reported the highest mean number of productive hours at baseline with 6.7 hours (86 percent) of the time at work designated productive. Nurses were observed with the fewest mean productive hours. Clinical officers were observed spending the greatest amount of time engaging in productive patient care hours (4.4 hours or 56 percent of the day); nurses had the fewest mean productive patient care hours (2.9 hours or 37 percent of the day). Midwives engaged in, on average, 0.1 more hours of productive nonpatient care hours per day than did clinical officers.

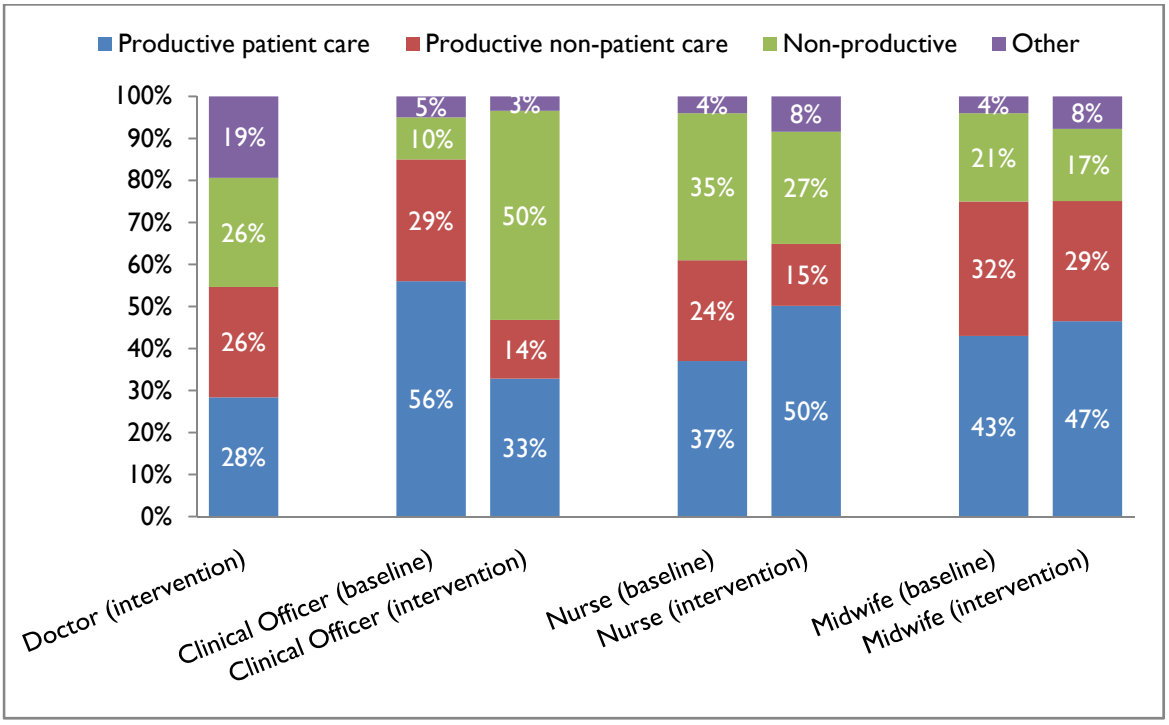
At endline, midwives reported the highest mean number of productive hours with 6.8 hours per day. Clinical officers were observed with the fewest mean productive hours (4.2). Nurses were observed spending the greatest amount of time engaging in productive patient care hours with 4.5 hours per day, followed by midwives with 4.2 hours per day. Doctors had the fewest mean productive patient care hours with 2.6 hours per day. Mean productive hours per day increased from baseline to endline for certified/registered nurses and certified/registered midwives, but decreased for clinical officers/assistant medical officers.

TABLE 5. MEAN PRODUCTIVITY BY CADRE IN INTERVENTION DISTRICTS AT BASELINE AND ENDLINE

	Baseline			Endline			
	Clinical Officers/ Assistant Medical Officer	Certified/ Registered Nurses	Certified/ Registered Midwives	Doctors	Clinical Officers/ Assistant Medical Officer	Certified/ Registered Nurses	Certified/ Registered Midwives
Mean productive hours per day	6.7	4.8	5.6	4.9	4.2	5.8	6.8
Mean productive patient care hours per day	4.4	2.9	3.2	2.6	3.0	4.5	4.2
Mean productive nonpatient care hours per day	2.3	1.9	2.4	2.4	1.3	1.3	2.6
Mean nonproductive hours per day	0.8	2.7	1.6	2.3	4.5	2.4	1.6

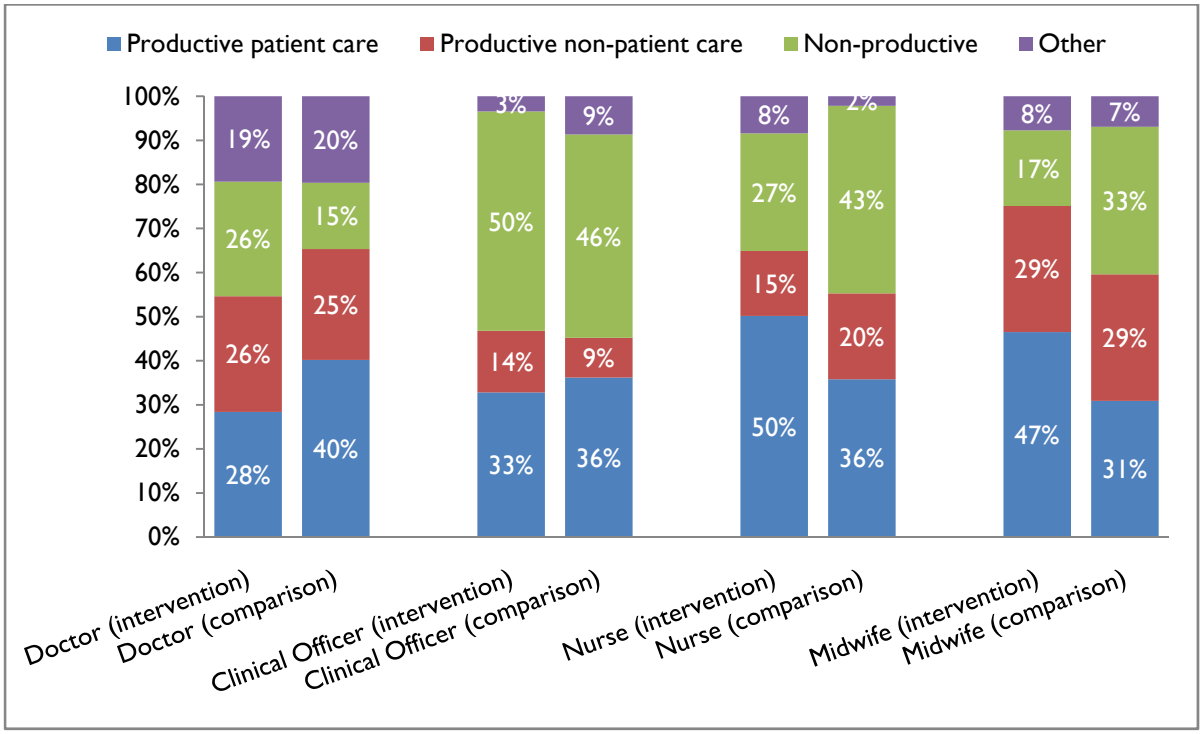
The distribution of time spent (productive, nonproductive, and other) by cadre is presented in Figures 1a and 1b. Comparing intervention districts at baseline and endline, the proportion of time that clinical officers spent on productive patient care decreased from 56 percent to 33 percent, while productive patient care time increased for both nurses (37 percent to 50 percent) and midwives (43 percent to 47 percent) (Figure 1a). The cadre that spent the least time on productive patient care at endline was doctors (28 percent), but data were not available for doctors at baseline to determine whether that figure had increased or decreased after the intervention.

FIGURE 1A: MEAN DISTRIBUTION OF TIME BY CADRE (INTERVENTION DISTRICTS AT BASELINE AND ENDLINE)



At endline, nurses and midwives in the intervention facilities spent more time on productive patient care than those in comparison districts, while for doctors and clinical officers, the opposite was true (Figure 1b).

FIGURE 1B: MEAN DISTRIBUTION OF TIME BY CADRE (INTERVENTION AND COMPARISON DISTRICTS AT ENDLINE)



Interestingly, the number of hours spent on direct patient care peaked on specific days of the week in each of the intervention facilities both at baseline (Figure 2a) and endline (Figure 2b). The day on which direct patient care hours peaked was not uniform across facilities, suggesting that facility-level scheduling (for instance, days designated for outpatient clinics) may contribute to these patterns. These observations also suggest that there is potential to increase mean time spent on direct patient care provision. A similar pattern was observed in the intervention districts at endline. All of the facilities (except for facility 5) experienced a peak in the number of hours spent on direct patient care, and these peaks occurred on different days for different facilities. Most facilities did not observe the same peak from baseline to endline.

FIGURE 2A: TIME SPENT ON DIRECT PATIENT CARE BY DAY AND FACILITY (IN INTERVENTION DISTRICTS AT BASELINE)

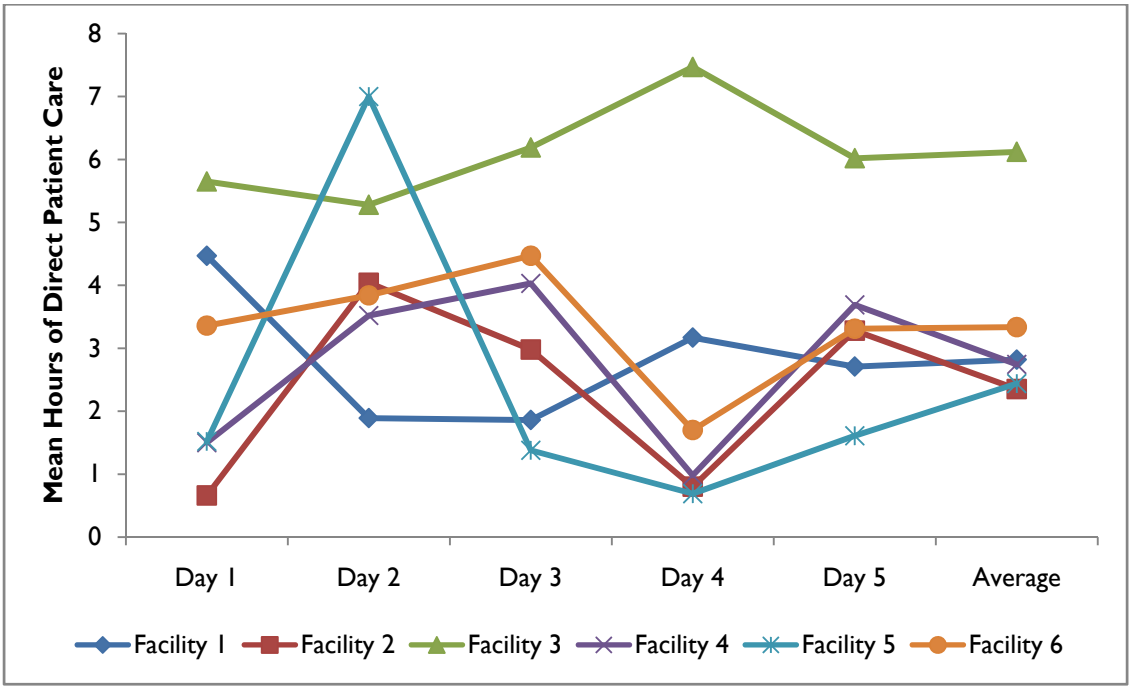


FIGURE 2B. TIME SPENT ON DIRECT PATIENT CARE BY DAY AND FACILITY (IN INTERVENTION DISTRICTS AT ENDLINE)

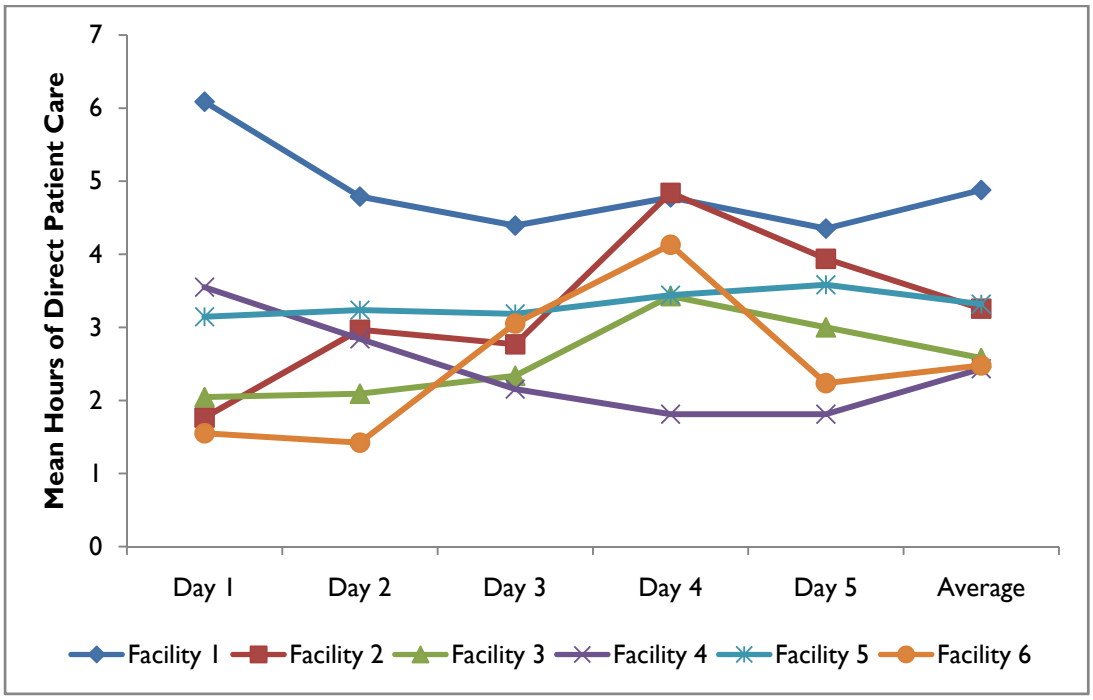
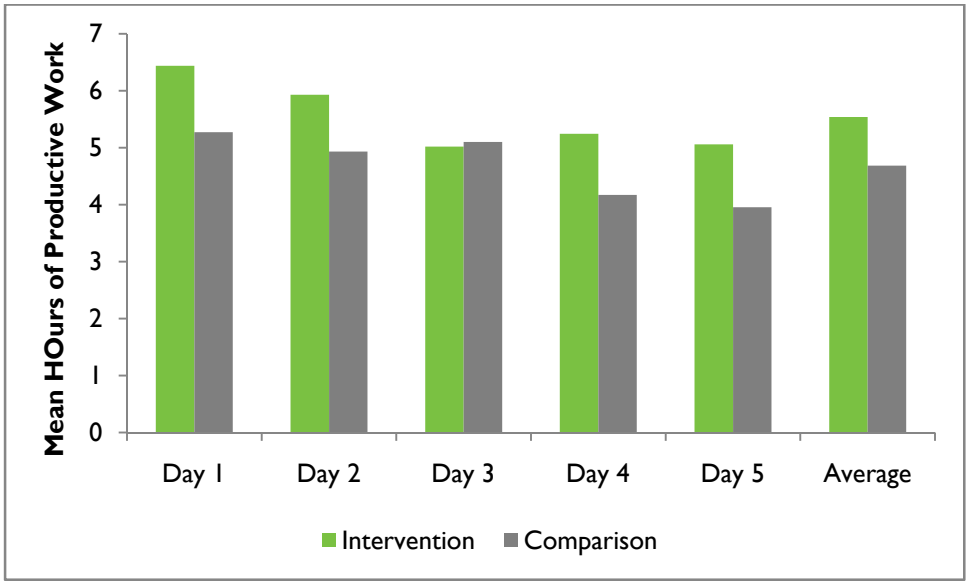


Figure 3 compares the time spent on productive work by day for both intervention and comparison districts at endline. Overall, hospitals in the intervention group observed greater number of hours spent on productive work compared to hospitals in the comparison group. One exception to this observation is seen on day 3 where hospitals in both intervention and comparison groups spent approximately 5.0 hours on productive work (5.0 and 5.1, respectively). On average, health workers in the intervention group spent 5.5 hours per day on productive work compared with 4.7 hours per day in the comparison group.

FIGURE 3: TIME SPENT ON PRODUCTIVE WORK BY DAY AT ENDLINE



3.2 BASELINE AND ENDLINE RESULTS FROM INTERVIEWS WITH HEALTH CARE WORKERS

Forty-one health workers were interviewed by data collectors at baseline in intervention facilities and 16 health workers were interviewed in comparison districts. The interview included questions on available equipment, stock-outs, and support of the health care worker's supervisor. In accordance with study protocol, interviews were conducted in a private location within the health facility. Initial questions probed on the role of human resources and administration. In the intervention group, 64 percent of those interviewed had been informed of job responsibilities prior to initiation of employment (vs. 48 percent in the comparison group) and 41 percent had ever seen a written description of their position (vs. 7 percent in the comparison group) (Table 6).

TABLE 6. HEALTH WORKERS REPORTING RECEIVING WRITTEN OR ORAL JOB DESCRIPTIONS, AT BASELINE AND ENDLINE

Job description	Baseline		Endline	
	Intervention	Comparison	Intervention	Comparison
Ever seen a written job description	41%	7%	62%	43%
Ever told about job description/ responsibilities when you started	64%	48%	77%	72%

At endline, 45 health workers were interviewed in the intervention districts and 61 health workers were interviewed in the comparison districts. Most (62 percent) of those interviewed in the intervention group had been informed of their job responsibilities prior to initiation of employment compared with 43 percent in the comparison group. In the intervention group, 77 percent had ever seen a written description of their position compared with 72 percent in the comparison group. In addition, there was an increase on average of 17 percent for health workers in the intervention group to ever see or been informed of their job description/responsibilities at endline compared with health workers in the comparison group at baseline (Table 6).

When questioned about compensation at baseline, 87 percent in the intervention group and 58 percent in the comparison group responded that they had received their salary late. At endline, receipt of late salary payments was reduced to 20 percent of health workers in both intervention and comparison districts.

At baseline, most health workers reported regular visits by an external supervisor. Just 10 percent in the intervention districts and 2 percent in the comparison districts indicated that they received no external supervision (Table 7). Between baseline and endline, the percentage of health workers reporting regular visits (once every 14-30 days) by an external supervisor decreased for hospitals in the intervention districts from 58 percent to 29 percent. However, frequent visits (more than once every 14 days) increased, from 4 percent to 11 percent.

TABLE 7. SUPERVISORY SUPPORT: FREQUENCY AND BENEFIT FOR PATIENT CARE

Supervisory support	Baseline		Endline	
	Intervention	Comparison	Intervention	Comparison
External supervisor visits				
More often than once every 14 days	4%	0%	11%	28%
Once every 14 - 30 days	58%	10%	29%	16%
Once every 31 - 45 days	8%	18%	11%	8%
Once every 45+ days	11%	28%	36%	34%
Never	10%	2%	7%	2%
Don't know	5%	30%	7%	10%
No response	5%	12%	0%	0%
Supervisory support helps me provide patient care				
Strongly disagree - 1	0%	0%	0%	3%
Disagree	1%	0%	4%	2%
Neither agree nor disagree	0%	8%	7%	5%
Agree	58%	39%	64%	56%
Strongly agree - 5	35%	29%	24%	34%
No response	5%	24%	0%	0%

Most of the health care workers in the intervention group (93percent) and in the comparison group (68 percent) agreed that supervisory visits helped provide patient care at baseline; by endline these proportions were 88 percent for the intervention group and 90 percent for the comparison group.

In addition to supervision, health workers were asked at baseline about on-the-job training opportunities. Among those interviewed at baseline, 58 percent of workers in the intervention group and 63 percent in the comparison group reported receiving some on-the-job training in the past 12 months (Table 8). Despite this training, 77 percent of health care workers in the intervention group and 49 percent in the comparison group felt that the lack of training affected HIV/AIDS service provision, while 66 percent in the intervention group and 74 percent in the comparison group believed that it affected non-HIV/AIDS service provision. A large percentage of health care workers (79 percent in the

intervention group, 74 percent in the comparison group) felt that lack of sufficient on-the-job training limited their ability to perform their job satisfactorily.

Among those interviewed at endline, 69 percent of workers in the intervention group reported receiving some on-the-job training in the past 12 months compared with 62 percent in the comparison group. In the intervention group, 80 percent of workers reported that lack of training affected HIV/AIDS service provision, but only 58 percent reported that lack of training affected non-HIV/AIDS service provision. Similar opinions were reported in the comparison group at endline, as 75 percent of workers reported that lack of training affected HIV/AIDS service provision, and 66 percent reported that lack of training affected non-HIV/AIDS service provision. At endline, respondents in the intervention group (91 percent) and in the comparison group (87 percent) agreed or strongly agreed that the absence of on-the-job training reduced their ability to provide health services in general.

Among the intervention group, 58 percent reported receiving on-the-job training at baseline and 69 percent reported receiving on-the-job training at endline.

TABLE 8. HEALTH WORKERS REPORTING RECEIVING ON-THE-JOB TRAINING, AND HEALTH WORKERS' PERCEPTION OF IMPACTS OF ON-THE-JOB TRAINING ON THE PROVISION OF HEALTH SERVICES

Training	Baseline		Endline	
	Intervention	Comparison	Intervention	Comparison
Received any on-the-job training in past 12 months	58%	63%	69%	62%
Lack of training affects HIV/AIDS service provision	77%	49%	80%	75%
Lack of training affects non-HIV/AIDS service provision	66%	74%	58%	66%
Absence of one-the-job training reduces ability to provide health services in general	79%	74%	91%	87%

Interviewers questioned health care workers on the availability of medical supplies and drugs in the district hospital in which they were employed. Among those interviewed at baseline, 45 percent of those in the intervention group and 65 percent in the comparison group reported that the facility in which they worked had experienced a stock-out of drugs or supplies in the seven days preceding the interview (Table 9). At endline, the proportion in the intervention group reporting stock-outs increased to 56 percent while the proportion in the comparison group decreased to 48 percent. A greater proportion of workers in both groups at endline felt that stock-outs affected the provision of HIV-related services compared with baseline. In contrast, the proportion of workers reporting that stock-outs affected provision of non-HIV-related services decreased in both groups.

TABLE 9. HEALTH WORKERS REPORTING DRUG AND SUPPLIES STOCK-OUTS AND HEALTH WORKERS' PERCEPTION OF IMPACT OF STOCK-OUTS ON SERVICE DELIVERY

Stock-outs of Drugs and Supplies	Baseline		Endline	
	Intervention	Comparison	Intervention	Comparison
Stock-outs of drugs and supplies	45%	65%	56%	48%
Stock-outs affect provision of HIV-related services	7%	12%	22%	25%
Stock-outs affect provision of non-HIV-related services	34%	46%	31%	38%
Stock-outs Affect Ability to Provide Health Services				
Strongly disagree	0%	0%	0%	2%
Disagree	7%	0%	11%	11%
Neither agree nor disagree	0%	0%	7%	2%
Agree	57%	57%	40%	46%
Strongly agree	31%	41%	42%	39%
No response	5%	2%	0%	0%

In addition to stock-outs, health care workers were also confronted by inadequate equipment. In the intervention group, the number of facilities reporting that their district hospital had inadequate equipment or instruments decreased from 96 percent at baseline to 29 percent at endline; a similar decrease was seen in comparison districts (65 percent to 28 percent) (Table 10). Among those who reported inadequate equipment or instruments at their facilities, the proportion stating that this affected their ability to provide patient care in the seven days before the interview decreased from 65 percent to 51 percent in the intervention group but increased from 38 percent to 52 percent in the comparison group from baseline to endline. A high proportion of workers in both groups agreed or strongly agreed both at baseline and endline with the statement, "Inadequate equipment and/or instruments adversely affected my ability to provide health services in general."

TABLE 10. PROPORTION OF HEALTH WORKERS REPORTING INADEQUATE EQUIPMENT AND INSTRUMENTS AND PERCEIVED IMPACT ON SERVICE DELIVERY

Equipment and Instruments	Baseline		Endline	
	Intervention	Comparison	Intervention	Comparison
Reporting inadequate equipment/ instruments at facility	96%	65%	29%	28%
Reporting that inadequate equipment/ instruments affected ability to provide patient care in last 7 days	65%	38%	51%	52%
Inadequate Equipment/Instruments Affected Ability to Provide General Health Services in the Last 7 Days				
Strongly disagree	0%	0%	2%	2%
Disagree	7%	2%	4%	3%
Neither agree nor disagree	0%	0%	4%	5%
Agree	64%	55%	42%	54%
Strongly agree	20%	39%	44%	36%
No response	9%	3%	2%	0%

3.3 INTERVIEWS WITH FACILITY DIRECTORS

As detailed above, the interventions carried out for this study were developed and chosen by facilities through an intensive stakeholder engagement process. Six intervention facilities participated in developing a range of interventions, and chose which to implement (Table 11).

TABLE 11. INTERVENTIONS IMPLEMENTED, BY FACILITY

	Intervention 1: Disseminate and operationalize a code of conduct	Intervention 2: Define and disseminate job descriptions and responsibilities for outpatient health workers and support staff	Intervention 3: Create a resource pool of individuals to be redeployed; intensify supervision	Intervention 4: Increase health worker competencies	Intervention 5: Provide training on facilitative supervision and management
Facility 1	X	X			X
Facility 2	X	X	X		
Facility 3	X	X	X	X	X
Facility 4			X		
Facility 5	X	X			X
Facility 6	X	X		X	

Interviews were conducted with District Medical Officers (DMOs) at the six intervention facilities approximately three months after the interventions were initiated, and again after the interventions ended. Interventions were implemented over a six month period. The goal of these interviews was to explore the ease with which these the interventions were implemented and the effects of the interventions on the facility and staff. The interviews illuminate the quantitative findings, and provide context for understanding how the interventions worked and why they produced certain effects.

The qualitative data suggest that many of the interventions generated changes at the facility and individual level, which in turn had a largely positive impact on health worker productivity and time spent on patient care. Moreover, a number of DMOs indicated that staff and facility improvements had a noticeable and beneficial impact on patients and the community.

At the facility level, interventions resulted in:

- A more organized workplace
- Enhanced human resource management
- Increased utilization of staff time on patient care
- Maximization of staff skill mix across units

At the individual level, interventions led to:

- Reduced absenteeism and tardiness
- Development and use of new skill sets
- Increased motivation
- Increased accountability

At the patient and community level, interventions resulted in:

- Fewer patient complaints
- Increased uptake of heath facility services by the community

Based on an analysis of the interviews, Table 12 reveals the strongest positive links DMOs noted between interventions and impacts. A number of DMOs noted challenges regarding Interventions 2, 4, and 5, discussed in more depth below.

TABLE 12. SUMMARY OF IMPACTS DETAILED BY FACILITY DIRECTORS, BY INTERVENTION

	Intervention 1: Disseminate and operationalize a code of conduct	**Intervention 2: Define and disseminate job descriptions and responsibilities for outpatient health workers and support staff**	**Intervention 3: Create a resource pool of individuals to be redeployed; intensify supervision**	**Intervention 4: Increase health worker competencies**	**Intervention 5: Provide training on facilitative supervision and management**
Created a more organized workplace	X		X		
Enhanced management of human resources	X		X		X
Increased utilization of staff time on patient care	X		X	X	X
Maximized skill mix across units			X	X	X
Fewer patient complaints	X		X		
Increased uptake of heath facility services by the community	X		X		
Reduced absenteeism and tardiness	X				
Developed and used new skill sets			X	X	X
Increased motivation	X		X	X	X
Increased accountability	X	X	X	X	X

This rest of this section will use the qualitative data to explore in more depth intervention impacts, as well as potential mechanisms through which productivity and time spent with patients increased or decreased for some cadres. This section will also discuss some of the challenges facilities faced in implementing the interventions, and potential negative outcomes of some interventions.

3.3.1 FACILITY-LEVEL IMPACTS

At the facility level, DMOs reported that most interventions contributed to enhanced human resource management and a more organized workplace. By strengthening these two areas, the interventions contributed to increased utilization of staff time on patient care and a better balance of skill mix across units. Notably, increased utilization of staff time and skills allowed units to run more efficiently, and in some cases, for longer periods of time. The qualitative data suggest these facility-level impacts had a positive impact on health worker productivity and time spent with patients.

Two of the interventions (disseminating a code of conduct and the deployment of a resource pool) had a particularly strong effect on these areas. The resource pool intervention balanced out and maximized the skill mix deployed across different units in facilities; allowed units that had been closed to reopen; and allowed certain units to expand the number of hours they were open. The code of conduct intervention expanded the number of hours certain units offered services because it encouraged health workers to report to units as assigned, and to report on time. Increases in productivity and time spent on patient care may partially stem from interventions that balanced out staffing across units, organized health workers' days better, and encouraged staff to report on time and as assigned.

Increased utilization of staff time on patient care

Five of the six intervention facilities introduced and disseminated a code of conduct. This intervention strengthened human resource management and had a positive impact on the level of organization at all five facilities. For example, in one facility, implementation of the code of conduct resulted in the development of a timetable for outpatient department (OPD) staffing. As a result, staff began showing up early or on time for their OPD shifts. This resulted in a fully staffed OPD throughout the entire nine-hour workday, potentially increasing the number of patients attended to. Moreover, the DMO overseeing the facility stated:

> *"The functioning of the facility and relations between staff have improved. The OPD has become more organized, and there has been a general improvement in awareness and knowledge levels, especially among professional staff. We have also seen an improvement in channels of communication, and in staff following protocol. People know where to report what. The relationship between management and facility staff, especially in rural health centers, has improved."*

The code of conduct intervention also helped staff to manage their time better, and miss work less. One DMO stated:

> *"Staff members manage time better, how to handle patients is clearer, people know what is expected of them…potentially more patients could be seen and the community has a better perception of the hospital now… Staff don't unnecessarily miss work."*

Another DMO noted that a drop in absenteeism reduced patient waiting times, thereby increasing the accessibility of health services.

The code of conduct intervention was not implemented without challenges. Some staff aresponded to it better than others. One DMO noted: "The human instinct is to resist change. What made it even more difficult was that this code was given to staff of varying educational levels. Others understood while others resisted."

Three of the six intervention facilities chose to create a resource pool of individuals that could be redeployed across units based on need. In one facility, this allowed management to begin staffing OPD daily with a clinical officer at 8 am instead of 10 am. This potentially resulted in an extra 10 hours per week for clinical officers to spend on patient care at that facility.

Maximized skill mix across units

Three of the five interventions (creating a resource pool of individuals, task-shifting, and supervisor/supervisee training) enhanced human resource management and maximized staff skill mixes across units. Trainings developed new skills among staff, or built up pre-existing skill sets. The resource pool created a mechanism through which human resources could experiment with departmental staffing, in order to improve the performance of units that were in need of strengthening. Importantly, these three interventions improved overall efficiency and facility performance by widening the range of services provided, potentially increasing the number of patients that could be treated, and improving quality of care.

DMOs responded very positively to these interventions, and reported that staff embraced these interventions. They did note that task-shifting and supervisor/supervisee training were time consuming and difficult to implement, as these efforts pull already overburdened staff away from everyday job duties to attend trainings. Nevertheless, DMOs indicated the benefits outweighed the positives.

For instance, at one facility, the resource pool intervention allowed management to easily restructure staffing in an effort to improve quality of care. Management redeployed strong staff to weaker units, and weaker staff to stronger units, in order to create a balance in terms of the quality of service provided across units. Human resources also restructured unit staffing to see if health workers who underperforming in one unit may perform better in other department. The DMO stated:

> *"In order to organize health services, or any services for that matter, you need to identify people who are performing badly and those who are performing well and then do a mix. The mix is important because while one may perform badly in one department, they may perform well in another department."*

In another facility, the combination of task-shifting and the creation of a resource pool involved training staff on new skills so that certain departments could remain open. This allowed patients to receive services they may have otherwise not been able to receive at the facility. According to the DMO, "Without the resource pool, some departments would have been totally shut, such as theater, which does not have an anesthetist. But a nurse who received basic training now does that role."

In a third facility, the task-shifting intervention involved administrative trainings that positively impacted patient waiting times. "We now see that patients wait for shorter periods of time. Registry cards are now more easily found because of training in administration. Before cards would be lost or take long to be found."

3.3.2 INDIVIDUAL-LEVEL IMPACTS

As discussed above, many interventions improved facility performance through engaging human resource staff and management in restructuring the use of staff time and skills. This in turn improved health worker productivity (by making better use of their time and skills) and increased the amount of time available to spend with patients (by maximizing the hours departments could be open). Importantly, some interventions employed in this study directly impacted health worker productivity at the individual level, through increasing health worker motivation and accountability.

Motivation

Human resources for health literature suggests that improved motivation may lead to improved productivity among health workers (Mathauer and Imhoff 2006). Thus, improving health worker motivation is a key strategy health facilities can use to make the most of health workers' time and skills, particularly in resource-strapped settings suffering from human resource shortages.

Providing trainings for staff, and informing staff of their duties and job descriptions, may be effective ways to improve motivation (Franco et al 2002). While health workers were not interviewed for this study, DMOs indicated that both interventions that involved training (task-shifting and supervisor/supervisee training) seemed to have a positive effect on health worker motivation. DMOs also stated that two of the three interventions (the resource pool and the code of conduct) that involved making staff aware of their duties had a positive impact on motivation.

One DMO noted that the resource pool had a positive impact on motivation because it made staff feel valued. Staff reacted positively to having their strengths recognized and being redeployed accordingly. He also found that informing staff about their roles, duties, and assignments in a structured and organized manner was a motivating factor. He stated:

> *"It affected health worker motivation in a positive manner. When we did staff reallocation, employees became aware of what they should do and exactly where they should be when they report. Before that, the staff would show up for work without knowing where or who to report to."*

However, regarding the resource pool intervention, one DMO found that there were sensitivities among staff who were not included in the resource pool, or among those who suspected they were getting reassigned to units because they were not performing well. One facility, which implemented the resource pool, job description, and code of conduct interventions, faced difficulties with the resource pool intervention: "When we decided to remove non-performers [from certain posts], some of them were quite bitter with management and because of that, some of them became extremely worse performers… [these employees] were called and counseled in relation to the terms and conditions of service. Some were given verbal warnings and charged."

Notably, in the only facility in which the resource pool intervention was used in tandem with the interventions involving staff trainings, the trainings provided to staff seemed to mitigate feelings of negativity among lower-performing staff who were assigned out of units. Since both high-performing staff and low-performing staff were engaged in trainings, it is possible that low-performing staff reacted positively to the opportunity to improve their skills, or at least felt less "left out" of changes occurring generally as a result of the interventions. This suggests that interventions that involve creating a resource pool of staff to redeploy may have stronger positive impacts on health worker motivation and productivity if they are implemented alongside interventions that involve task-shifting or staff trainings.

The qualitative data strongly supported the notion that trainings and task-shifting motivated employees. One DMO stated: "Those that learnt new skills were inspired with the sense of having to do something different. There was no monetary motivation, but they were motivated nonetheless." The challenge facilities faced was finding the time and resources to provide trainings for staff.

The code of conduct is another intervention that had a positive impact on motivation. Similar to other interventions, an underlying component of the intervention was to focus the human resource and management team on devoting time to working on human resource issues at the facility, and to facilitate conversation between management and health workers. One DMO stated: "Introducing this code meant constant dialogue, and that in itself made staff feel cared for and motivated then to work. The introduction of the code also promoted harmony, which resulted in health workers doing their job in a better environment." The DMO also suggested two ways to take more full advantage of the code of

conduct intervention as a motivational tool: "It would be helpful to practice facilitative supervision as opposed to policing members of staff. I would encourage those intending to implement this intervention to make sure the document is available and understandable."

As discussed above, in the section on facility-level impacts of the intervention, the code of conduct intervention contributed to a more organized workplace. DMOs notes that enhanced organization of the facility in turn had a positive impact on health worker motivation. A DMO reported: "The disorderliness which existed before was killing [health worker] spirit to work but now health workers are happy and more positive about their work."

One intervention had a mixed effect on health worker motivation. According to DMOs, handing out job descriptions clashed with health workers' everyday reality of working in the context of a human resource shortage. Because most health workers have to perform job duties beyond their job description, DMOs feared that handing out job descriptions would result in health workers protesting performing duties beyond what appeared on paper. In one facility, the intervention did have this effect. The DMO reported: "Some staff members refused to do anything outside their job description. They did not feel protected doing what they may not have trained for. As such, in certain instances, patients suffered." DMOs also stated that the job description intervention clashed with the task-shifting intervention, since current job descriptions do not encompass task-shifting.

In sum, the job descriptions current at the time of the study did not encompass the full range of activities most health worker cadres were performing. Thus, the job descriptions, in some cases, were demotivating factors. Moreover, the job description intervention brought to the forefront a key issue facing health workers in facilities suffering from staff shortages. Namely, in cases where trainings are not accompanying task-shifting, staff may perform duties they have not been trained to do. Staff who are called to perform duties beyond their job description may fear they will take the blame if and when patient care is negatively affected. DMOs noted they were in a difficult position – they recognized the need for providing trainings to staff who were taking on a broader range of duties, but in some cases lack resources to provide the needed trainings. A potential recommendation would be for the MOH to update job descriptions and make them broader (for instance, by including language on performing other duties as assigned). Despite the difficulties surrounding the job description intervention, DMOs reported that the provision of job descriptions is essential to good facility management.

Accountability

Feeling accountable for one's work is another individual-level dynamic the interventions impacted. All of the interventions included an element of empowering health workers with more knowledge about their roles and expectations. All DMOs reported an increase in health worker accountability for their work and commitment toward their work.

The code of conduct intervention and the job description intervention were the most strongly linked to having an impact on accountability. In terms of the code of conduct, one DMO noted that the code of conduct intervention made it clear that there are "consequences for negative patient care." As a result, he noticed health workers showing a stronger commitment to their patients. Generally, DMOs reported that the code of conduct intervention impact on accountability was one of the strongest effects of the intervention observed.

The job description intervention was effective in strengthening accountability among health workers who were not routinely called upon to perform job duties outside of their job description. At one facility, paramedics' performance improved after implementation of the job description intervention; at another facility, supervisor performance improved. However, job descriptions, when provided to cadres who perform duties outside of their job description, served in some cases to encourage those cadres to feel accountable only for the work listed in the description. Two facilities noted that in the context of

the job description intervention, major tensions were found among nurses, who were regularly performing doctor's duties.

3.3.3 PATIENT AND COMMUNITY-LEVEL IMPACTS

Though clients were not interviewed for this study, DMOs noted some positive impacts of the interventions on clients and the larger community. Key effects included: a reduction in patient complaints; client reluctance to be referred; and an uptake in health services offered by the facility. One DMO reported: "It appears patients are happy with services now, judging by their reluctance to be referred to [another facility]. Staff attitude has also improved. Patients no longer call the community radio station to complain about the hospital."

4. KEY IMPLICATIONS

This report summarizes key findings of the stakeholder-driven participatory productivity improvement process. Rather than acting as a stand-alone resource, the highlights presented in this report are meant to shed light on how a participatory process of problem diagnosis can be used to develop productivity improvement interventions. The results of the study also shed light on which interventions may be most appropriate and effective for improving productivity within the Zambian context, and could be implemented on a wider scale within the country.

Baseline and endline data collected from health workers through observation and in-depth interviews reveal that:

- At endline, doctors, nurses, and midwives spent the majority of their days engaged in productive activity; however, only 28 percent (doctors) to 50 percent (nurses) of their days are spent on direct patient care. This suggests the importance of increasing time spent on direct patient care across cadres.
- From baseline to endline, time spent on productive patient care increased for nurses and midwives.
- From baseline to endline, time spent on productive patient care decreased for clinical officers. Reasons for this are not clear. There is room to increase the amount of time that clinical officers spend on productive patient care activities.
- Health workers report equipment, drugs, and supply shortages that they believe impact the quality of services (both HIV- and non-HIV-related) provided to patients.
- Health workers believe that on-the-job training and external supervision are important tools for improving patient care and perceive that more on-the-job training is needed to optimize their ability to deliver health services.
- Lack of resources and time were the two key obstacles faced in implementing productivity improvement interventions; staff resistance was minimal.
- Two interventions, the code of conduct and resource pool interventions, could be implemented relatively easily in a wider range of facilities.
- Interventions generated changes at three levels: (1) Facility-level changes included a more organized workspace, enhanced human resource management, increased utilization of staff time on patient care, and maximization of staff skill mix across units; (2) Individual-level changes included reduced absenteeism and tardiness, development of use of new skill sets, increased motivation, and increased accountability; and (3) Patient/community-level changes included fewer patient complaints and increased uptake of health facility services by the community.

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