Zanzibar Health Care Worker Productivity Study:
Preliminary Study Findings

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Acronyms

CDC	US Centers for Disease Control and Prevention
CE	Continuing Education
CO	Clinical Officer
DHMT	District Health Management Team
HRH	Human Resources for Health
MCHA	Maternal and Child Health Assistants
MOHSW	Ministry of Health and Social Welfare
PHC	Primary Health Care
PHCC	Primary Health Care Center
PHCU	Primary Health Care Unit
PHNB	Public Health Nurses
TWG	Technical Working Group
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
ZHSRSP I	Zanzibar Health Sector Reform Strategic Plan I 2002/03—2006/07
ZHSSRSP II	Zanzibar Health Sector Reform Strategic Plan II 2006/07—2010/11

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Executive Summary

Health care worker productivity is an important ingredient of quality health care services. The benefits of addressing productivity include greater efficiency, reduced workload intensity, increased worker satisfaction and a higher quality of care. In Zanzibar, the Ministry of Health and Social Welfare (MOHSW) is committed to developing low-cost health interventions that improve productivity and address the key health challenges. Zanzibar's health infrastructure relies on a network of first- and second-line Primary Health Care Units (PHCUs), which are the cornerstone of Zanzibar's public health care system. In addition to providing the first tier of direct care, PHCUs are expected to deliver community outreach and education programs, and gather and report community health care data back to higher levels. When PHCUs experience problems with efficiency and quality of care, these problems ripple up through other levels, undermining the entire health care system.

In 2002, Zanzibar initiated health sector reform. One of the reform's principal aims was to decentralize the planning, prioritizing and integration of health services to the district level. As part of the push toward decentralization, the reform plan also emphasized improvements at community-level facilities to ensure the availability of high quality services and an essential primary health care package. In 2006, assessment of the reform process resulted in a new strategic plan (the Zanzibar Health Sector Reform Strategic Plan II, or ZHSRSP II). Improving the quality of care and productivity of health care workers at all levels of the health care system is a principal goal in the ZHSRSP II, through strategies such as strengthening human resources for health, improving efficiency through integration of services and decentralizing health service delivery.

To support these efforts, the Capacity Project (in partnership with the MOHSW) is carrying out the Zanzibar Project to Support Greater Productivity, a five-phase initiative to investigate productivity in the health care sector and select, implement and evaluate interventions to improve health worker efficiency. The Project completed a baseline study in the summer of 2006, followed in November by a stakeholder workshop to present the study results, analyze the most significant productivity gaps and identify and select interventions to improve productivity.

The baseline study used intensive observation to document "productive" and "unproductive" uses of time in a sample of 65 health care workers in 30 health facilities. Proportionately more health workers were sampled at PHCUs compared with other types of facilities (such as district and referral hospitals). Productivity was defined as the percentage of observed health worker time spent doing one of eight activities: direct patient care, indirect care, outreach, administration, meetings, training, cleaning/maintenance or personal hygiene.

On average, health workers spent three-fifths (61%) of their observed on-the-job time doing productive activities, primarily providing direct care for patients. They spent more than one-fourth (27%) of the observed time doing unproductive activities, mostly waiting for patients. Absences of various kinds accounted for 8% of observed time. By cadre, productivity levels were highest for clinical officers (88%) and doctors (78%), whereas public health nurses spent less than half of their time (46%) in productive activities. Comparison of providers' time use and patient waiting areas also indicates that providers and clinics tend to be busiest in the early morning hours and earlier in the week. Across facilities, health worker productivity fell dramatically from late morning on. As the day progressed, the percentage of time providers

spent directly interacting with patients declined while the percentage of health workers' time spent waiting for patients increased.

Supported by the baseline study findings, workshop participants identified two significant productivity gaps: low productivity at the primary health care level; and declines in productivity over the course of the workday. Workshop participants also identified two systemic problems that go beyond the issue of health care provider productivity: misallocation of health workers across the health care system; and inappropriate use of referral facilities by patients who bypass community-level facilities.

Workshop participants perceived the problem of low productivity at the primary health care level to be the most immediate and the most amenable to intervention. Several lower-level cadres, particularly public health nurses, offer a significant potential for productivity gains. Workshop participants and government stakeholders therefore identified a "bundle" of three relatively small-scale, low-cost and feasible interventions that address the productivity issues identified at the primary health care level. The interventions specifically target PHCU managers and the next tier of health system management, the District Health Management Teams (DHMTs). The interventions leverage work already initiated or undertaken by the MOHSW, and are expected to require minimal time and effort to plan and implement. Although they will initially cover a subset of PHCUs, they could be scaled up relatively quickly across all PHCUs. The three interventions are as follows:

1. **Strengthen the HRH Technical Working Group.** The Human Resources for Health Technical Working Group (HRH TWG) is one of four technical working groups established by the MOHSW. The HRH TWG will play a lead role in moving ahead with productivity improvement interventions. To strengthen the team's ability to lead and sustain HRH efforts, the Capacity Project will provide targeted consultation, coaching and training to team members. Support will focus on the areas of implementation planning, program and project management, change management and effective coordination across the four TWGs.

2. **Develop time management procedures for PHCU managers and DHMTs.** To use their time productively, particularly during periods of low patient load, health workers can benefit from time management guidelines. This intervention will develop time management procedures specifically for PHCU managers and DHMTs. The procedures will also outline documentation and reporting requirements between the facility and district levels, and will include quality assurance guidelines.

3. **Strengthen supervision systems.** When the time management procedures have been completed, DHMTs and PHCU managers will receive consultation and training in supervision skills, supervision tools and feedback mechanisms. After receiving appropriate training and support, the DHMTs will help disseminate the finalized time management procedures at the PHCU level.

Our recommendation to focus on strengthening productivity at the primary health care level emerges from our observations of health worker behavior and health facility waiting areas. Our study findings indicate that provider productivity and clinic efficiency vary significantly by level of Zanzibar's public health care system. We found average productivity to be greater among higher-level cadres and at higher-level facilities. Moreover, providers and facilities tended to be busier both earlier in the week and earlier in the day. These findings highlight the importance of

developing strategies to optimize providers' use of time and improve clinics' patient flow and management procedures. To make lasting improvements in health worker productivity, it is also critical that policy-makers and stakeholders understand the need for productivity improvement, how it can be attained and the positive difference it will make to quality of care and the responsiveness of the health system to the community.

A final note: Because we found that the term "productivity" elicited some adverse reactions among subjects in the study, we adopted the term "time utilization" during the study, instead of "productivity."

1. Introduction

1.1 Project Overview

Health care worker productivity is a vital ingredient of quality health care services. Interventions to improve productivity can remove obstacles to greater efficiency while lessening workload intensity. The most effective measures to improve productivity increase worker satisfaction without imposing an additional workload burden on already hard-pressed health care workers.

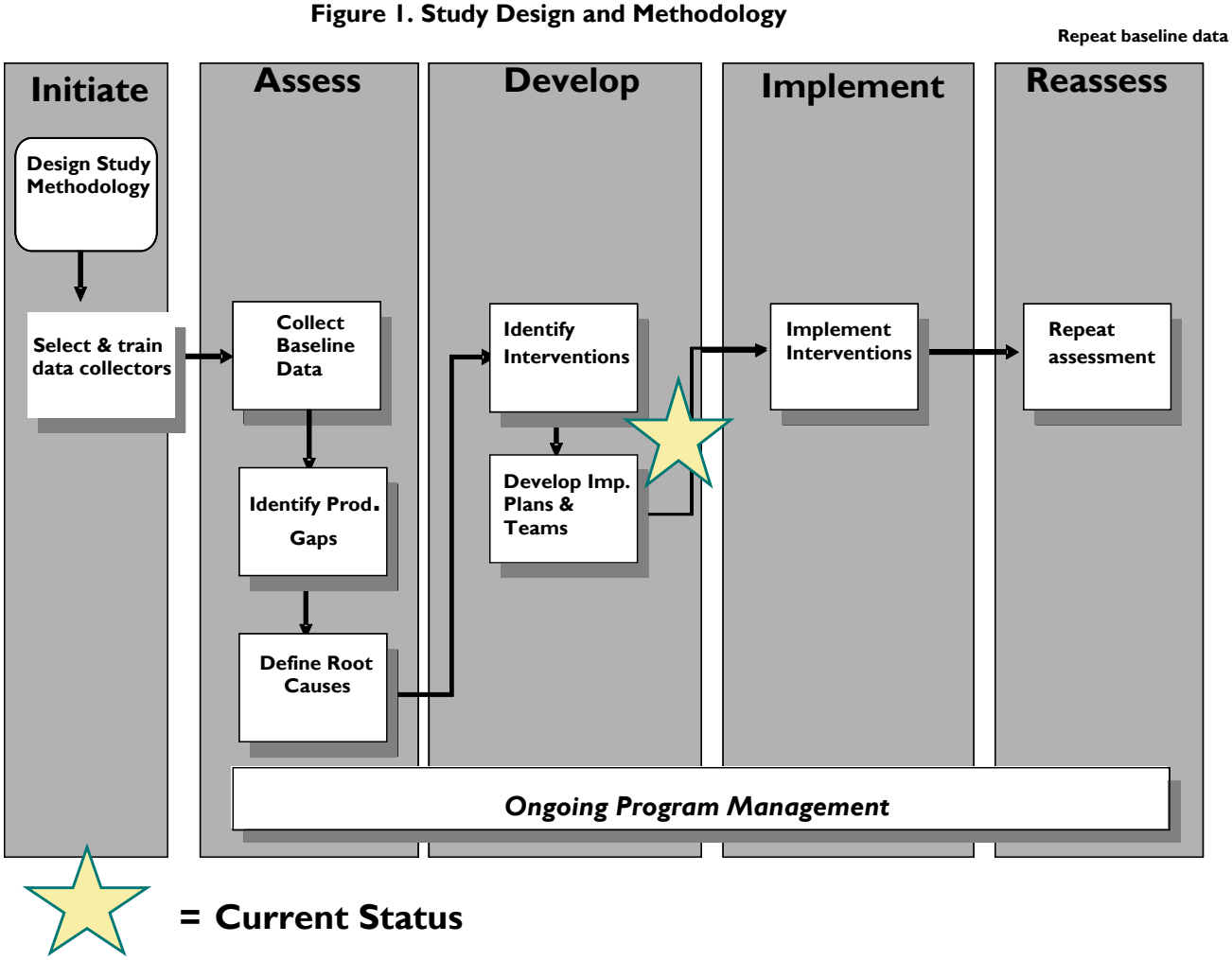
The Zanzibar Ministry of Health and Social Welfare (MOHSW) is committed to developing low-cost health interventions that address the key health challenges. The Zanzibar Project to Support Greater Productivity is a five-phase initiative designed to investigate the generally-held view that productivity in the Zanzibar health care sector is low, and that carefully selected interventions can be implemented to improve health care worker efficiency. Carried out by the Capacity Project in partnership with the MOHSW, the project's five phases are as follows (see Figure 1):

1. **Initiate** project (design study and prepare for data collection)
2. **Assess** productivity levels (collect baseline data, determine root causes of productivity gaps)
3. Identify, select and **design** management interventions to improve productivity
4. **Implement** interventions in selected facilities
5. **Evaluate** impact of interventions on health worker productivity.

With funding from the United States Agency for International Development (USAID), the project completed a baseline study (phase one and part of phase two) in the summer of 2006 (Zanzibar Health Care Worker Productivity Study). In November 2006, a three-day stakeholder workshop (Achieving a More Efficient Health Care System) was held in Zanzibar City to present the findings of the baseline study, complete a root cause analysis of the most significant productivity gaps and identify and select interventions to improve productivity (the remainder of phase two and phase three). Representatives of the MOHSW, USAID, the Capacity Project and other donors and stakeholders participated in the workshop.

This report summarizes the findings and conclusions of these two efforts. Specifically, we present the baseline study findings, identify areas where current productivity falls short of desired levels, consider the root causes of identified productivity gaps and offer practical recommendations for feasible management interventions to improve productivity. We conclude with a short-term action plan for moving forward with implementation activities.

Figure 1. Study Design and Methodology



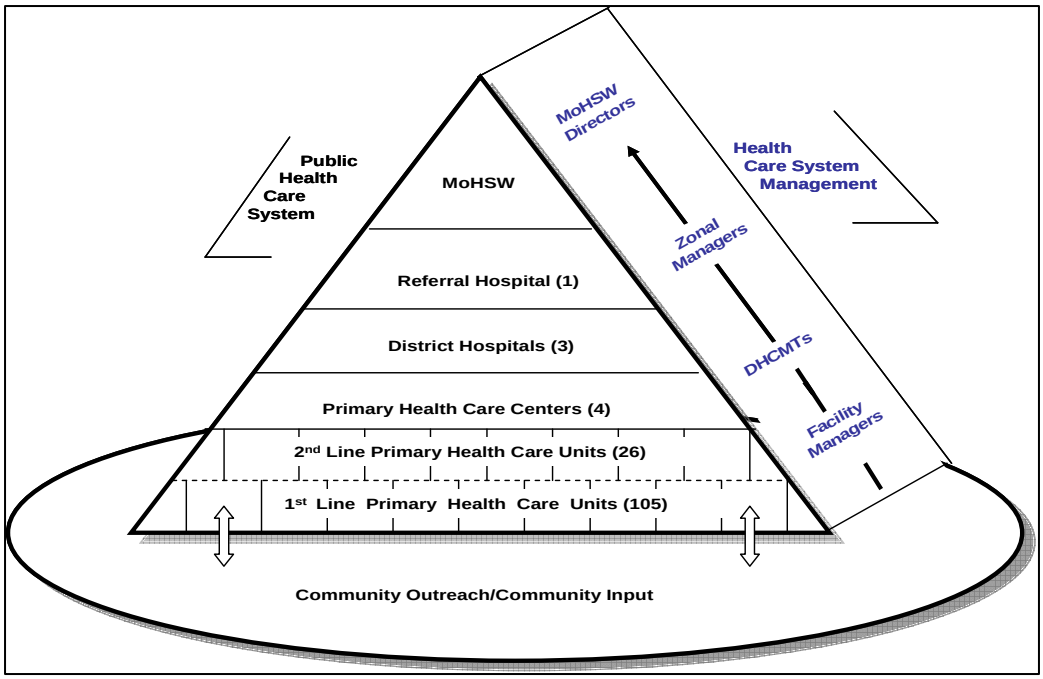
1.2 Background

Located off mainland Tanzania in East Africa, Zanzibar is densely populated, with almost one million inhabitants. Zanzibar's population is divided between two main islands, Unguja and Pemba, and a number of smaller islets. Zanzibar has been a semi-autonomous region within the United Republic of Tanzania since 1964. It elects and maintains its own government, which is directly responsible for all non-union affairs, including health services. There are five administrative regions in Zanzibar, subdivided into ten districts.

Residents of Zanzibar have a life expectancy at birth of approximately 57 years. According to the 2004/05 Demographic and Health Survey, the infant mortality rate fell to 61 per 1,000 live births, down from 83 per 1,000 in a 1999 survey. In the late 1990s, UNICEF estimated the facility-based maternal mortality rate to be 377 per 100,000 live births. Preventable communicable diseases such as malaria and tuberculosis are key contributors to morbidity and mortality in Zanzibar, as are diarrhea, pregnancy- and childbirth-related conditions and respiratory infections in young children. In recent years there has been an increase in non-communicable diseases such as diabetes, cardiovascular disease and breast cancer.

In 2002 Zanzibar initiated health sector reform, guided by the Zanzibar Health Sector Reform Strategic Plan I 2002/03—2006/07 (ZHSRSP I). The reform's key aim was to decentralize the planning, prioritizing and integration of health services to the district level, while ensuring the availability of equitable high-quality health care services, including an essential primary health care (PHC) package. As part of the push toward decentralization, the reform plan emphasized improvements in health care delivery at community-level facilities. At this level, Zanzibar's public sector health infrastructure relies on a network of first- and second-line Primary Health Care Units (PHCUs), which then refer patients, as needed, to a smaller number of Primary Health Care Centers (PHCCs) and District Hospitals (Figure 2).

Figure 2. Zanzibar Health Care Pyramid



A year before the end of the first plan period, Zanzibar developed the more comprehensive and feasible Zanzibar Health Sector Reform Strategic Plan II 2006/07—2010/11 (ZHSRSP II) to address concerns that the ZHSRSP I had failed to adequately guide policy- and decision-makers. The ZHSRSP II has five core themes:

1. Strengthen human resources for health (HRH)
2. Strengthen decentralized health service delivery
3. Ensure coverage for vulnerable groups
4. Improve efficiency through integration
5. Improve transparency, accountability and partnerships.

Improving the quality of care and productivity of health care workers at all levels of the health care system is a principal goal in the ZHSRSP II. Another important goal of the strategic plan is to expand access to services at PHCUs.

2. Methods

2.1 Objectives

The baseline study and stakeholder workshop had three primary objectives:

1. Provide the MOHSW with information on the productivity levels of existing health care workers in Zanzibar (baseline study)
2. Identify opportunities to improve system efficiency (workshop)
3. Identify and select interventions to support improved productivity in the provision of health services (workshop).

2.2 Study Design

Overview

The Zanzibar Health Care Worker Productivity Study was modeled after a health worker time use study conducted by the World Bank in Tanzania in 2000. The principal method used in that study was intensive observation of health care workers to document "productive" and "non-productive" uses of time, supplemented by interviews with health workers and facility staff.

Instruments

Replicating the World Bank methodology, the Zanzibar baseline study used the following four instruments and methods:

1. Brief **preliminary interviews with health care workers** to describe the study, obtain informed consent and collect basic demographic information (Annex A)
2. **Direct observation of health workers** using an observation form to record allocation of time across a pre-identified set of activity categories (Annex B)
3. **Direct observation of waiting areas** to document patient load and workflow (Annex C)
4. Detailed **follow-up interviews with health care workers** to discuss individual workers' perspectives on their productivity and performance (Annex D).

The findings in this report are limited to the data from the preliminary interviews and two types of observation (numbers 1 and 3).

Sampling

Sampling occurred at both the facility and health care worker levels. In keeping with the aims of the ZHSRSP II (to make primary health care the cornerstone of Zanzibar's health system), the study focused on primary care rather than more advanced levels of care. Even in higher-level facilities such as hospitals, data collection was carried out in the facilities' primary care units rather than in specialty units.

- ***Facility level.*** To ensure that the study represented diverse facility types and locations, we sampled at least one facility from each of the islands' ten districts. The resulting facility sample includes approximately one fourth (24%) of the 126 public sector health

facilities operated by the MOHSW on the two islands of Unguja and Pemba (Table 1). In all, the study gathered observations in 30 facilities (10 on Pemba and 20 on Unguja).

Table 1. Facility Sample

Facility Type	Total Facilities	Number (%) of Sampled Facilities
1st Line PHCU	101	14 (14%)
2nd Line PHCU	15	9 (60%)
PHCC	4	3 (75%)
District Hospital	3	2 (66%)
Referral/Maternity Hospital	2	2 (100%)
Mental Hospital	1	0 (0%)
TOTAL	**126**	**30 (24%)**

In theory, second-line PHCUs are slightly larger than first-line PHCUs and should offer additional services such as laboratory and dental services. In practice, most second-line PHCUs lack the extra services and are functionally equivalent to first-line PHCUs. In subsequent tables, therefore, we combine both types of PHCUs.

- ***Health care worker level.*** At each of the 30 facilities, data collectors typically observed two health workers. According to the most recent census of MOHSW health workers (conducted in 2003), the final sample (N=65) represents about 3% of the total workforce in the selected facilities (N=1,949). In keeping with the study's emphasis on primary care, we sampled a higher proportion of workers from primary care facilities than from hospitals (Table 2).

Table 2. Sample as Proportion of Total Health Workers, By Facility Type

Facility Type	Total Health Workers	Number (%) Sampled
1st & 2nd Line PHCU	664	49 (7%)
PHCC	163	6 (4%)
District Hospital	365	4 (1%)
Referral/Maternity Hospital	757	6 (1%)
TOTAL	**1,949**	**65 (3%)**

Procedures

The study was carried out by 11 data collectors, ten of whom were recruited through the Tanzanian National Institute for Medical Research. Of these, five were recent medical graduates and five had a background in medical sociology. An American intern sponsored by the US Centers for Disease Control and Prevention (CDC) also assisted with data collection. The study team received four days of training (approximately 32 hours), including a half day of field testing at Mnazi Mmoja Hospital and one day of preliminary site visits. Training was provided by a staff member from the Capacity Project and a regional consultant.

In each facility, data collectors were instructed to select two to three full-time providers representing distinct cadres, randomly selected within cadres. If a doctor or clinical officer (CO) was present in the facility, data collectors observed a doctor or CO and a nurse. If no doctor or CO was present, then the sample included a nurse and a staff member from a lower-level cadre.

After recruiting the study participants, data collectors obtained informed consent and administered a brief preliminary interview (Annex A). Starting on the morning of a new day, the interviewers then observed the health workers' use of time (Annex B) and made observations about patient load (Annex C). Data collectors observed health workers for an entire shift over five working days, recording actions at six-minute intervals throughout the day using a digital wristwatch (see Annex E for a more detailed description). A separate observation form was used for each health worker observed. After completing all observations, the data collectors conducted longer interviews with the health workers (Annex D).

Variables

Time use was documented on a precoded form with 15 activity categories, including eight productive activities, three unproductive activities and four types of absences (Table 3). We defined productivity as the percentage of observed time spent doing one of the eight "productive" activities.

Table 3. Time Use Study Variables: Activity Categories and Definitions

Type of Activity	Definition
Productive activities	
Direct patient care	Direct interactions between a health worker and a patient as well as activities directly related to the care of patients (e.g., consultation, examination, procedures, surgery)
Indirect care	Activities connected to patient care, but not involving direct provision of health services (e.g., patient registration, recordkeeping, consultation with other health workers regarding a patient's diagnosis or treatment)
Outreach	The provision of clinical services on an outreach basis (based on self-report of worker or worker's supervisor)
Administration	Activities related to the management and/or administration of the facility
Meetings	A **planned** meeting (either on- or off-site) of two or more staff members to discuss work-related issues
Training	A **planned** meeting (either on- or off-site) of two or more staff members and/or external visitors to transfer knowledge
Cleaning, preparation, maintenance	Activities related to the cleaning, preparation and maintenance of equipment or rooms/buildings
Personal hygiene	Activities related to health workers' personal hygiene (e.g., hand-washing)
Unproductive activities	
Waiting for patients	Time health workers spend waiting for patients without doing any other productive activity
Breaks	Breaks from work for recreation or eating
Social visits	Contacts with relatives/friends that are unrelated to clinical/medical work
Absences	
Illness	Absence due to illness
Funerals	Hours or days of absence (extra time off) to attend a funeral of a close relative, arranged with the facility director's consent
Salary	Time spent traveling to collect salary from a central facility
Unexplained absence	Absence that cannot be explained by colleagues
Other	
Other or not observed	Type of activity that does not fall under any of the above categories

Analysis

Raw data from the health worker observations were first entered into forms in Microsoft Excel, and then imported from Excel into SPSS-13 to be restructured for cleaning and analysis. Frequencies and counts were checked to verify the correct number, dates and sequence of forms. Data codes had to match for importation to succeed.

All calculations and the generation of frequencies, means, descriptive statistics and means comparisons were carried out in SPSS. During the first stage of our analysis, we calculated the total number of observations for each provider, by hour and day of the week and by observation category. During the second stage of analysis, we used these counts to calculate the percentage of the provider's observed time for each category.

3. Baseline Study Findings

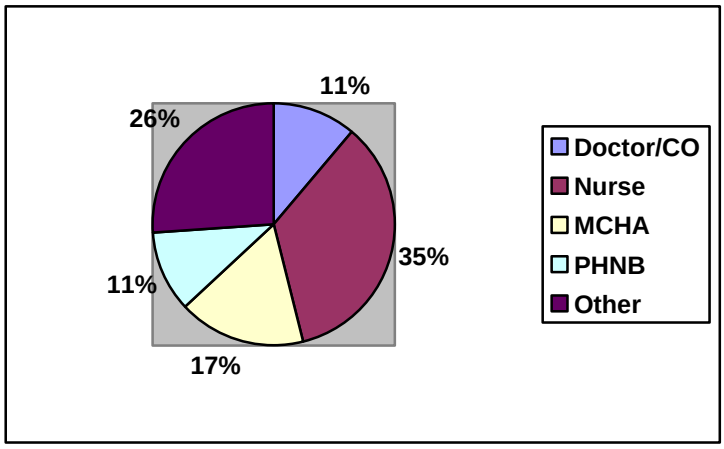
3.1 Participants

Data collectors gathered observations on a total of 65 health care workers. Workers were observed in all 10 districts and all types of health facilities. The characteristics of the sample were as follows:

- Two-thirds (66%) of the sampled workers were female
- Workers had a median age of 44 years (range=24-67)
- Three-fourths (74%) of the observed workers were employed in PHCUs (46% in first-line facilities and 28% in second-line PHCUs).

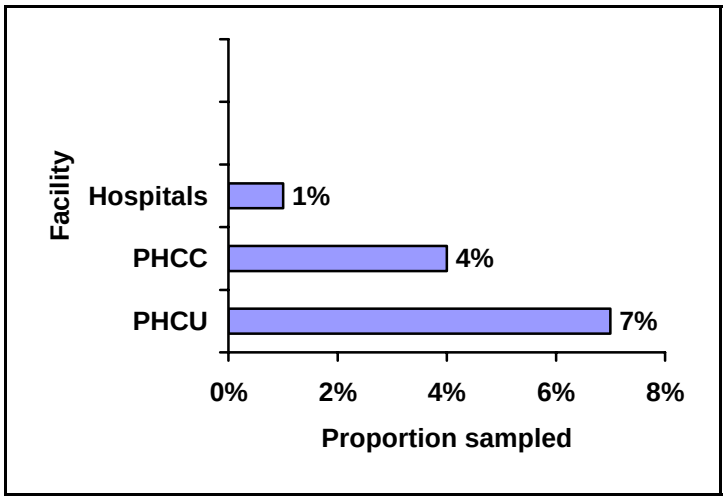
Just over a third of the workers were nurses (n=23) (see Figure 3). The sample also included significant proportions of two lower-middle cadres: maternal and child health assistants (MCHAs) (17% or n=11) and public health nurses (PHNBs) (11% or n=7). In some instances, PHNBs and MCHAs functioned as the professionals in charge of their facilities. Doctors (n=2) and COs (n=5) together represented 11% of the sample. Lower-level staff such as health orderlies, laboratory technicians and dental and pharmacy assistants comprised the remaining one-fourth (26% or n=17). The fact that the final sample included only two doctors is not surprising when considering the distribution and size of the pool of doctors identified in the 2003 survey of MOHSW health workers: the survey found just 55 doctors in the entire MOHSW system, nearly all of whom (53) worked in the main referral hospital. Because most of the referral hospital doctors worked in units other than primary care, few doctors fell into our study's primary care sampling frame.

Figure 3. Health Workers Observed, By Cadre



Proportionately more health workers were sampled at PHCUs compared with other types of facilities (Figure 4). Approximately 7% of all health workers employed at PHCUs were included in the study (49/664). The study included 4% of health workers at PHCCs (6/163) and less than 1% of health workers at district and referral hospitals (10/1,122).

Figure 4. Proportion of Workforce Sampled, By Facility Type



3.2 Productivity

Overall Productivity

We defined productivity as the percentage of observed health worker time spent doing one of the eight "productive" activities shown in Table 3. On average, health workers spent three-fifths (61%) of their observed on-the-job time doing productive activities and more than one-fourth (27%) of the observed time doing unproductive activities (Figure 5). Absences of various kinds accounted for 8% of observed time. Health workers devoted nearly half (46%) of their total time to direct care for patients—by far the highest subcategory of productive activities (Table 4). Unproductive time spent waiting for patients was substantial (20%)—on average, the equivalent of a full day in a 40-hour work week.

Figure 5. Baseline Productivity Level (N=65)

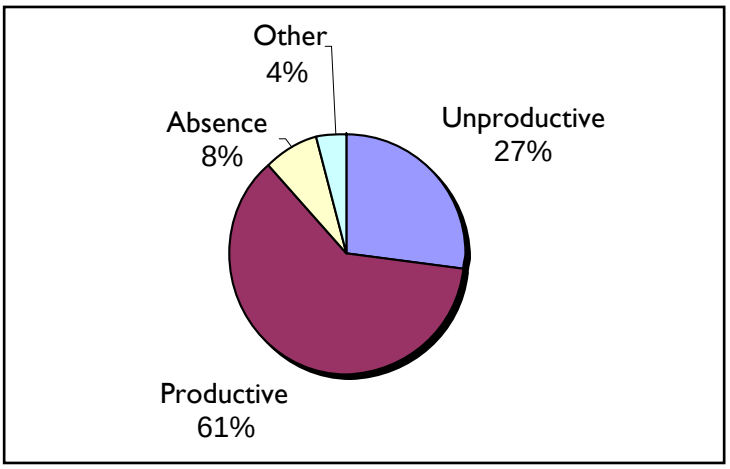


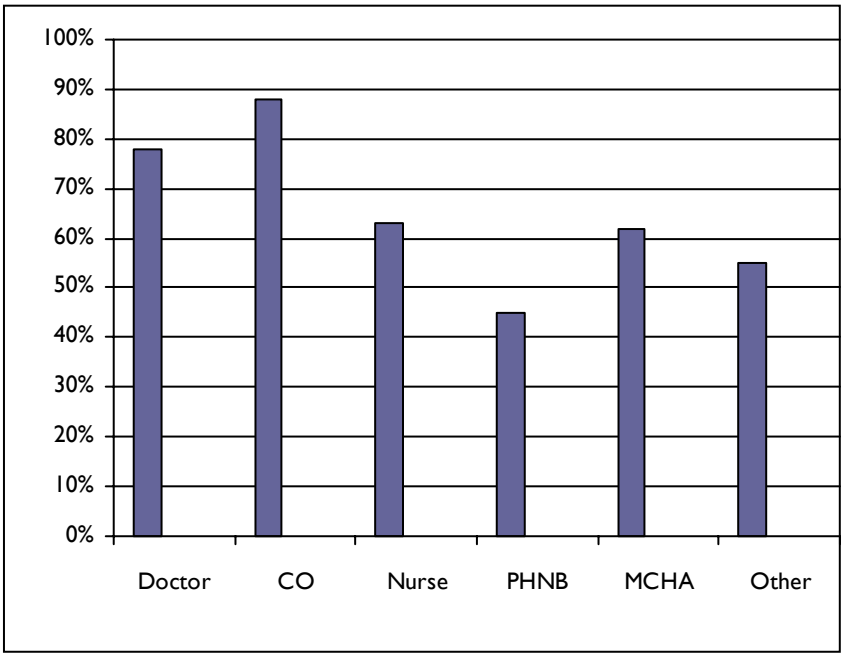
Table 4. Average Percentage of Observed Time, By Subcategory

Activity Categories		Observed Time (Average %)
Productive	Direct care	46%
	Administration	4%
	Cleaning and preparation	3%
	Outreach	3%
	Indirect care	2%
	Training	1%
	Meetings	1%
	Personal hygiene	<1%
	Total	**61%**
Unproductive	Waiting for patients	20%
	Breaks	6%
	Social visits	1%
	Total	**27%**
Absence	Unexplained absence	5%
	Collect salary	2%
	Funeral	<1%
	Illness	<1%
	Total	**8%**
Other	Other	
	Total	**4%**

Productivity By Cadre

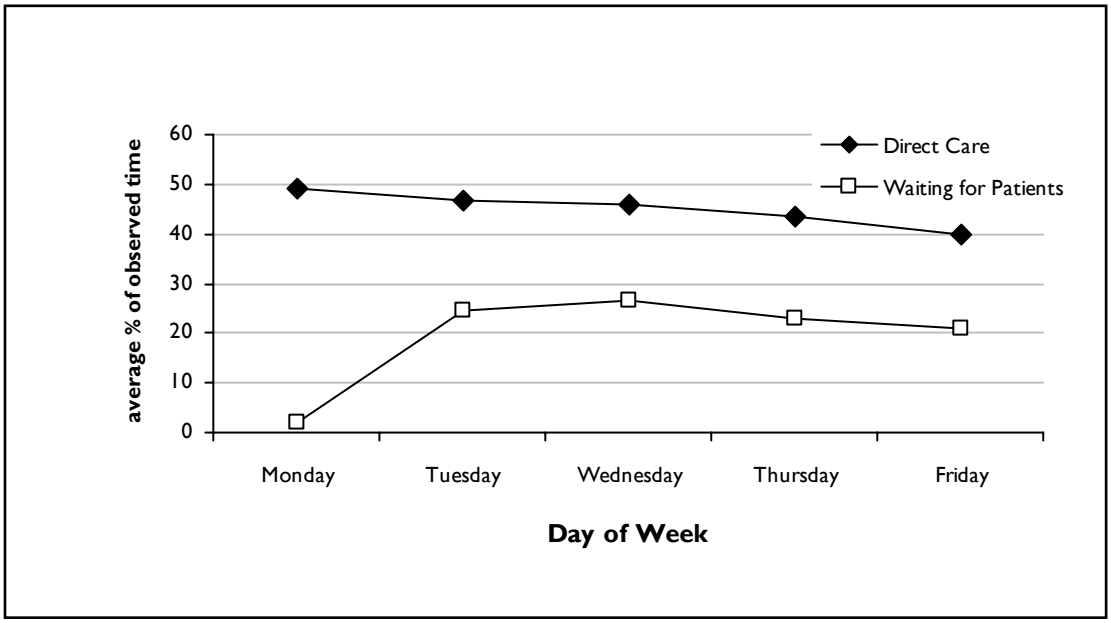
By cadre, productivity levels were highest for COs (88%) and doctors (78%), whereas PHNBs spent less than half of their time (46%) in productive activities (Figure 6). COs and doctors spent most of their total and productive time in direct patient care (74% and 64% of total observed time).

Figure 6. Productivity Levels, By Cadre



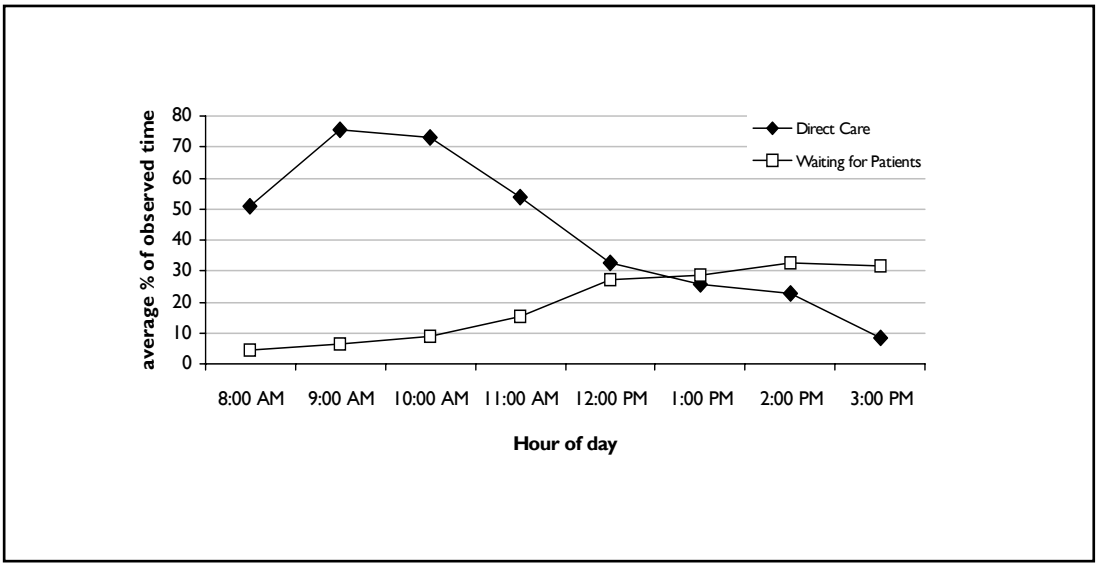
Examining the sample over the course of the work week, Figure 7 shows a gradual and steady decline in the percentage of observed time spent in direct patient care from Monday through Friday. However, the percentage of observed time that providers spend waiting for patients exhibits a different pattern. Time spent waiting for patients increases notably from Monday to Tuesday but then remains relatively constant for the rest of the week.

Figure 7. Average Percentage of Observed Time Spent in Direct Patient Care and Waiting For Patients, By Day of Week



The trend lines for time spent in direct patient care and time spent waiting for patients show yet another pattern when examined over the course of a day (Figure 8). The percentage of observed provider time spent in direct patient care peaks early (at 9:00 a.m.) and begins declining precipitously by 10:00 a.m., while the percentage of time that providers spend waiting for patients climbs steadily throughout the day.

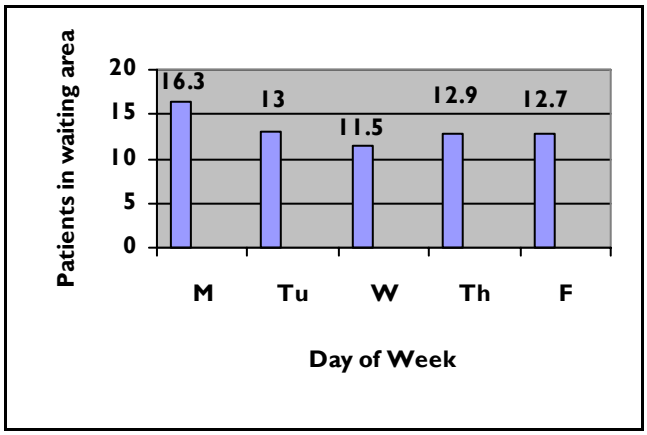
Figure 8. Average Percentage of Observed Time Spent in Direct Patient Care and Waiting For Patients, By Hour of Day



Patient Load

In addition to assessing providers' use of time, data collectors made observations about the number of patients in the waiting area at any given time. Across all facilities, Mondays were busier than any other day of the week (Figure 9).

Figure 9. Average Number of Patients in Waiting Area at Any Given Time



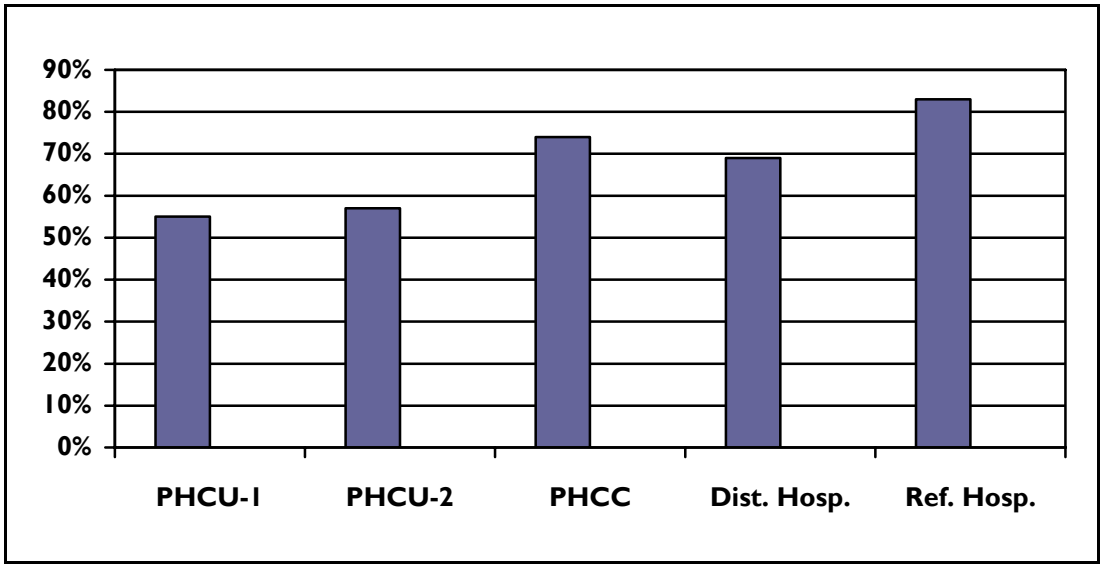
Over the course of the day, patient flow peaked in the morning hours, declining noticeably after 10:00 a.m. In some facilities, there were no patients in the waiting room in the afternoon hours.

Comparing the time providers spend in direct patient care and the number of patients in the waiting area, it is clear that providers and clinics tend to be busier in the mornings than in the afternoons. PHCUs of both types had fewer patients in their waiting rooms than higher-level facilities had, most likely because hospitals serve more patients overall than smaller and more remote community-based facilities.

Productivity By Facility Type and District

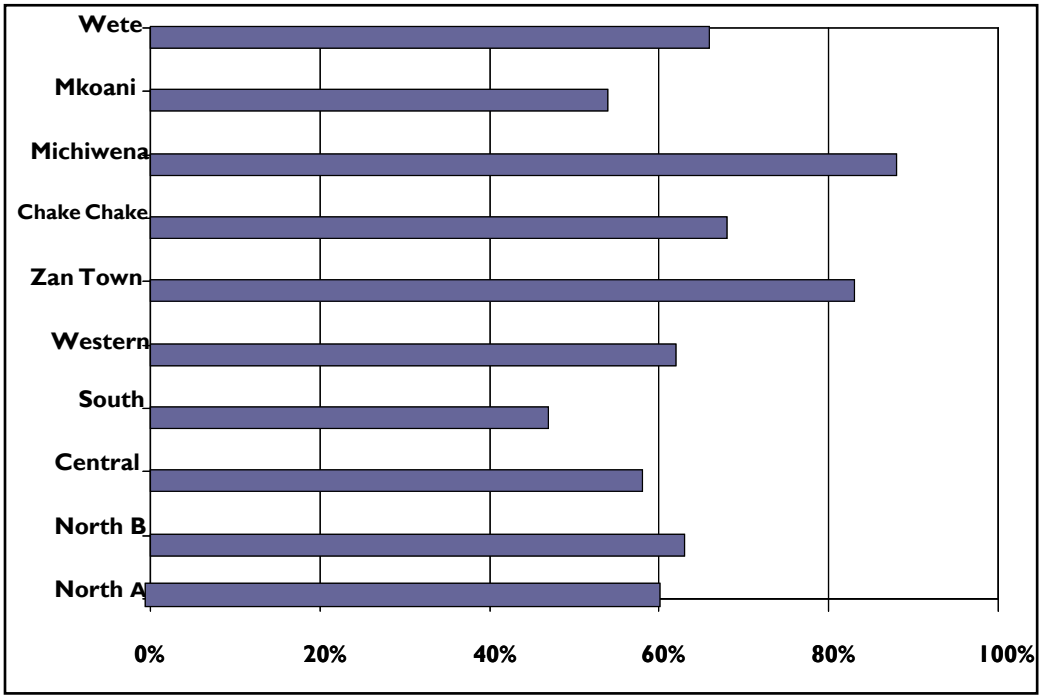
Productivity levels also varied by facility type and district. Given the small sample sizes involved, it is not possible to isolate the effects of each variable, but it is clear that the variables are interrelated. For example, some districts had no higher-level facilities, and doctors were sampled in one hospital only. Figure 11 shows the differences in productivity levels by type of facility. Zanzibar's referral hospital recorded the highest productivity level (83%), while PHCUs recorded the lowest levels (55%-57%).

Figure 10. Productivity By Type of Facility



By district, productivity was highest in the Michiwena district on Pemba island (88%) and in the capital city district of Zanzibar Town (83%) (Figure 12). Unguja South recorded the lowest productivity (47%).

Figure 11. Productivity By District



4. Workshop Findings

4.1 Workshop Overview

The productivity workshop was used to review the baseline study findings and reach consensus on the most significant productivity gaps. Workshop participants used the "why, why, why" technique to complete a root cause analysis for some of the productivity gaps as well as other issues suggested by participants. Having determined the root cause(s) for each gap area, participants then identified intervention ideas and strategies, evaluating each idea against a set of agreed-upon implementation criteria.

4.2 Productivity and Health System Gaps

Supported by the baseline study findings, workshop participants identified two significant productivity gaps (problems 1 and 2, below). Participants also identified two systemic problems that go beyond the issue of health care provider productivity but are outlined here because of their perceived importance (numbers 3 and 4).

- ***Problem 1: Low productivity at the PHC level.*** Across the different facility types or levels within the overall public health care system, first- and second-line PHCUs together recorded the lowest productivity percentage (56%). By cadre, the observed productivity of PHNBs was particularly low (44%). More than a third (36%) of PHNBs' observed time was classified as unproductive, primarily waiting for patients.

- ***Problem 2: Declines in productivity over the course of the day.*** Across facilities, the level of health worker productivity fell dramatically from late morning on. As the day progressed, the percentage of time providers spent directly interacting with patients declined while the percentage of health workers' time spent waiting for patients increased.

- ***Problem 3: Misallocation of health care workers across the health care system.*** Workshop participants viewed health worker misallocation as a mismatch between providers' skills and expertise, on the one hand, and the most critical medical needs of the community or catchment area, on the other hand. Health worker misallocation can negatively affect productivity and quality of care, and can result in health care services being offered by unqualified staff.

- ***Problem 4: Inappropriate use of referral facilities by patients.*** Workshop participants noted that clients often bypass community-level facilities to seek health care services at a higher level. This causes imbalances in health worker-to-patient ratios and undermines provider efficiency as well as quality of care.

4.3 Exploration of Root Causes and Interventions

The problem of low productivity at the PHC level was perceived to be the most immediate and the most amenable to intervention. Workshop participants therefore identified a number of root causes and corresponding interventions for this problem (see Annex F). Participants discussed a wide range of root causes, including macro-level issues such as insufficient medical training institutions and limited continuing education opportunities, and shortcomings at the operational level such as deficient supervision and a lack of clear guidance on health worker time management. As responses to these gaps, workshop participants discussed broad, Ministry-level initiatives to strengthen the Continuing Education Unit and provide incentives for workers to accept rural PHCU positions, as well as interventions specifically targeting District Health Management Teams (DHMTs) and PHCU operations.

5. Discussion

5.1 Intervention Priorities

Workshop participants and key government stakeholders agreed that the initial round of interventions should prioritize the first productivity gap area, namely the low productivity observed at the PHC level. There are many reasons why an immediate focus on PHC productivity is both necessary and desirable. First, Zanzibar's 105 first-line and 26 second-line PHCUs are the cornerstone of its public health care system, described by the MOHSW as the critical interface with the patient community. In addition to providing direct care, PHCUs are expected to deliver community outreach and education programs, and gather and report community health care data back to the district, zonal and Ministry levels. When primary care facilities experience problems with efficiency and quality of care, these problems ripple up through other levels, undermining the entire health care system.

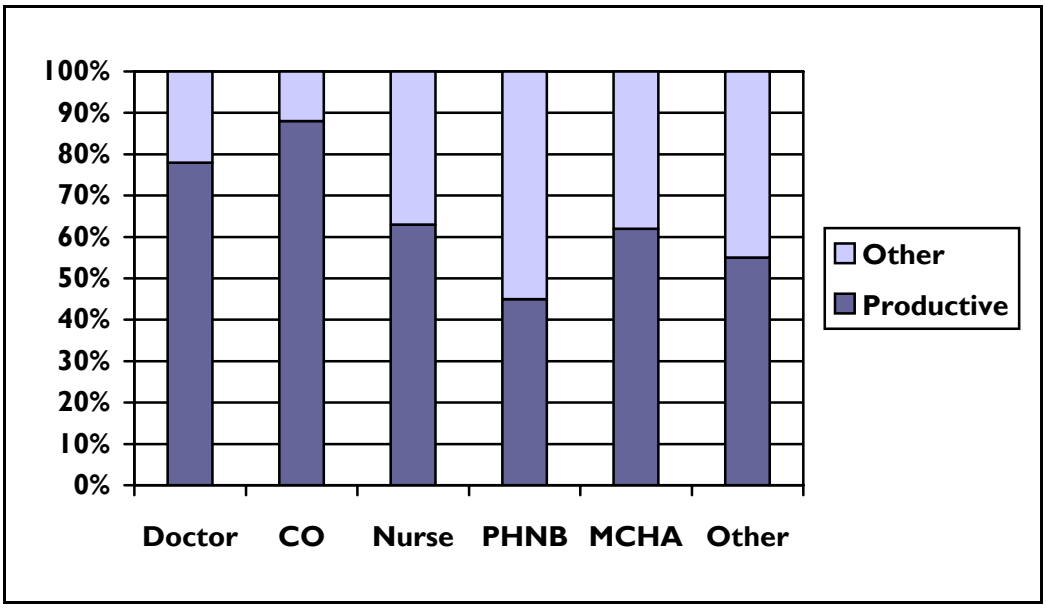
Second, many of the reform proposals and strategies outlined in the ZHSRSP II underscore the importance of strengthening health care delivery at the community level. A number of these focus on the principles of decentralizing planning and prioritization decisions to the facility level

and expanding the range of services offered at lower-level facilities. Inefficiencies weaken the ability of PHC providers and facilities to absorb new management responsibilities or expanded services.

Third, as emphasized in the ZHSRSP II, the health system's four PHCCs and eight District Hospitals are intended to be referral facilities for the PHCUs. However, as noted by workshop participants, ineffectiveness at the PHC level often prompts patients to bypass their local PHCUs and seek care at higher levels (see Section 4.2, problem 4). The result is patient congestion at the higher-level facilities, which, in turn, prevents the PHCCs and hospitals from focusing on their referral functions. Indeed, analysis undertaken as part of the Mnazi Mmoja Hospital development plan revealed that only 4% of hospital patients had arrived as referrals from other facilities.

Finally, our baseline study findings show that several lower-level health cadres, particularly PHNBs, offer a significant potential for productivity gains (Figure 13). Whereas COs and doctors spent most of their time in direct patient care, lower-level health workers spent 26% to 36% of their time in unproductive activities, primarily waiting for patients.

Figure 12. Potential Productivity Gains, By Cadre



5.2 Recommendations

Using the baseline study findings and the criteria outlined in Table 5, workshop participants and key MOHSW staff identified a "bundle" of three relatively small-scale, low-cost and feasible interventions that address the productivity issues identified at the PHC level. The interventions specifically target PHCU managers and the next tier of health system management, namely the DHMTs. The interventions leverage work already initiated or undertaken by the MOHSW, and are expected to require minimal time and effort to plan and implement. Although they will initially cover a subset of PHCUs, they could be scaled up relatively quickly across all PHCUs.

Table 5. Intervention Criteria

Criteria	Desired Level or Value
Level of complexity	Low
Cost to develop and scale up	Low
Implementation timeframe	Short-term
Resource requirements	Low
Potential impact	Opportunity for a "quick win"

- ***Intervention 1: Strengthen the technical working group on health.*** In April 2006, the Capacity Project carried out an assessment that resulted in a human resources management action plan. The Human Resources for Health Technical Working Group (HRH TWG) is one of four technical working groups established by the MOHSW to support implementation of this action plan. The HRH TWG will play a lead role in moving ahead with productivity improvement interventions. To strengthen the HRH team's ability to lead and sustain HRH efforts, the Capacity Project will provide targeted consultation, coaching and training to team members. Support will focus on implementation planning, program and project management, change management and effective coordination across the four TWGs.

- ***Intervention 2: Develop clear time management procedures for PHCU managers and DHMTs.*** To use their time productively, particularly during periods of low patient load, health care workers can benefit from written time management guidelines. This intervention will develop time management procedures specifically for PHCU managers and DHMTs. The procedures will also outline documentation and reporting requirements between the facility and district levels, and will include quality assurance guidelines.

  To support optimal implementation and adoption of the time management procedures, the Capacity Project has already sponsored an implementation planning meeting to elaborate on the details and scope of the procedures. The meeting was attended by a representative sample of PHCU managers and DHMTs. The primary goal of the meeting was to ensure that development and implementation of the procedures are grounded in the operational reality of the PHCUs and DHMTs. In addition, the meeting increased ownership of the change effort by engaging DHMTs and PHCU-level stakeholders directly in productivity improvement efforts, and provided a forum for identifying the best strategy to scale up across all PHCUs.

- ***Intervention 3: Strengthen supervision systems.*** When the time management procedures have been completed, DHMTs and PHCU managers will receive consultation and training in supervision skills, supervision tools and feedback mechanisms. After receiving appropriate training and support, the DHMTs will help disseminate the finalized time management procedures at the PHCU level.

6. Conclusions

Improvements in productivity can be initiated and encouraged at many levels, as shown in Table 6. Productivity may be influenced by patient management procedures, staffing patterns, supervision, training opportunities, the general work environment and the community itself.

There are many benefits to addressing productivity at multiple levels, including greater efficiency, reduced workload intensity and a higher quality of care.

Table 6. Potential Productivity Interventions, By Level of Intervention

Level	Possible Interventions
Patient Management	✓ Effective patient administration process ✓ Coordinated patient transfer process ✓ Feedback on referred patients
Staffing and Mentorship	✓ Appropriate staffing mix and level ✓ Experienced personnel ✓ New staff orientation program ✓ Experienced staff mentoring new staff ✓ Ratio of new staff to experienced staff
Supervision	✓ Quality supervision ✓ Reliance on peers and supervisors (operating as a team) ✓ Structured and timely feedback on performance
Training	✓ Structured learning opportunities ✓ Training needs assessment
Work Environment	✓ Quality interpersonal relationships ✓ Trusting work environment ✓ Open dialogue ✓ Participation in policy- and decision-making ✓ Clear job descriptions based on competency standards
Community	✓ Positive feedback from community

Our recommendation to focus initially on strengthening productivity at the PHC level emerges from our baseline study observations of health worker behavior and health facility waiting areas. Our study findings indicate that provider productivity and clinic efficiency vary significantly by level of Zanzibar's public health care system. In our sample of 65 health workers across 30 facilities, average productivity was greater among higher-level cadres (e.g., doctors and COs) and at higher-level facilities (e.g., hospitals and PHCCs), compared with lower-level cadres and PHC units. Moreover, providers and health facilities tended to be busier both earlier in the week and earlier in the day. These findings highlight the importance of developing strategies to optimize providers' use of time and improve clinics' patient flow and management procedures.

To make lasting improvements in health worker productivity, however, it is critical to develop a comprehensive and well-constructed change process. In particular, change has to matter to those who are expected to make the change. Successful intervention requires that committed internal change agents lead the way, with support from leaders and stakeholders at each organizational or sector level. Even more importantly, perhaps, the purpose, benefits and anticipated results of the change must be clearly articulated. When leaders and stakeholders understand the need for productivity improvement, how it can be attained and the positive difference it will make to quality of care and the responsiveness of the health system to the community, then the stage will be set for successful intervention.

Annex A: Preliminary Interview Form

Assign a participant code using: 2 digit interviewer code, 2 digit day of interview, 1 digit interview sequence (1=1st interview of the day, 2=2nd interview, 3=3rd interview, etc. . .) Please use this code on all subsequent forms connected with this health worker, including the observation sheets and the follow-on interview.

Q#	Question	Options	Code Response
Interview Context			
1	Name of Interviewer:		
2	Date of Interview:		
3	Location of facility: *Code district name*	1. Unguja North A 2. Unguja North B 3. Unguja Central 4. Unguja Southern 5. Western Unguja 6. Zanzibar Town 7. Chake Chake 8. Michiweni 9. Mkoani 10. Wete	
4	Type of facility:	1. 1st Line PHCU 2. 2nd line PHCU 3. PHCC (Cottage Hospital) 4. District Hospital 5. Referral Hospital	
Basic Demographics of Interviewee			
5	Gender of worker	1. Female 2. Male	
6	Year of birth	19__	
7	What is your position in this facility? *Fill in open response*		
8	What cadre of health care worker best describes you? *Read all options*	1. Doctor 2. Clinical Officer 3. Assistant Medical Officer 4. Nurse: (Specify) 5. Public Health Nurse B 6. MCHA 0. Other: Specify	

Annex B: Time Use Observation Form

Participant code:				productive time								non productive time								other	total	default
										sanitation		absence										
Observation Date:				direct patient care	Indirect care	outreach	administration	meetings	training	cleaning, preparation	personal hygiene	illness	funeral	holidays	collect salary	unexplained absence	waiting for patients	breaks	social visits/contacts	other	total - default excluded	default
Time hr	min	min	min																			
7	00																					
	06																					
	12																					
	18																					
	24																					
	30																					
	36																					
	42																					
	48																					
	54																					
Total 1																						
				A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
8	00																					
	06																					
	12																					
	18																					
	24																					
	30																					
	36																					
	42																					
	48																					
	54																					
Total 2																						
				A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S

[Note: Table continues with rest of hours. It is shown in excerpted form here.]

Comments, Explanations and Observations	Start Time
	Stop Time

Annex C: Patient Load Observation Form

Observer Name & Code					Facility Name, Type, & Location
Observation Date:				**# of people in the patient waiting area**	**Comments**
Time					
hr	min	min	min		
7			04		
			10		
			16		
			22		
			28		
			34		
			40		
			46		
			52		
			58		
Total 1					
8			04		
			10		
			16		
			22		
			28		
			34		
			40		
			46		
			52		
			58		
Total 2					
9			04		
			10		
			16		
			22		
			28		
			34		
			40		
			46		
			52		
			58		
Total 3					
10			04		
			10		
			16		
			22		
			28		
			34		
			40		
			46		
			52		
			58		
Total 4					

[Note: Table continues with rest of hours. It is shown in excerpted form here.]

Annex D: Follow-Up Interview

Important: Fill in the participant code at the top of this and every page of this form

1.1.1 Part 1: Health Worker Demographics

Q#	Question	Options	Code Response
Interview Context			
1.1	Name of Interviewer:		
1.2	Date of Interview:		
1.3	Name of facility:		
1.4	Type of facility:	6. 1st Line PHCU 7. 2nd line PHCU 8. PHCC 9. District Hospital 10. Referral Hospital	
Demographics of Interviewee			
1.6	Participant Code		
1.7	Gender of worker	3. Female 4. Male	
1.8	Year of birth	19__	
1.9	What is your position in this facility?	*(Fill in open response)*	
1.10	What cadre of health care worker are you?	7. Doctor 8. Clinical Officer 9. Assistant Medical Officer 10. Nurse: (Specify) 11. Public Health Nurse B 12. MCHA 0. Other: Specify	
1.11	For about how long have you been working in this facility?	*Code years and months if less than one year*	Years: Months:
1.12	For about how long have you been working in the health sector?	*Code years and months if less than one year*	Years: Months:

1.1.2 Part 2: Questions about the past week

For each of the following questions, please respond only with regards to this past week (during the observation period).

2.1 In this past week, was there any point where you lacked the supplies or drugs that you needed to perform part of your job? Specify and describe all such instances.

2.2 At any time in this past week, have any of your co-workers in this facility/clinic been absent, on leave, or otherwise away from their post for any reason? Please specify their position and the day or days they were away.

2.3 In this past week, did you have to work beyond your scheduled working hours? Specify the number of extra hours and the reasons. Do not include time on call unless you were called for duty.

2.4 In this past week, would you say the number of patients that came to this clinic/facility was about the same, higher, or lower than in a typical week? Why?

2.5 In this past week, would you say your work load was higher than usual, lower than usual, or about the same as usual? Why?

2.6 What other factors do you feel affected your job performance over the past week?

1.1.2.1 Part 3: Work hours

For the remaining questions, please answer with regard to the general working conditions you experience at this facility, not only during the past week.

3.1 What are the scheduled hours of this clinic?

3.2 What are your scheduled working hours?

3.3 Do you ever have to work outside of your scheduled working hours? Under what circumstances? How often? About how many extra hours per week?

3.4 How are you compensated for any extra time that you must work?

3.5 Do you ever work less than your scheduled hours? What are the reasons you might do this?

3.6 Do you feel that you are fairly compensated for the hours that you must work?

1.1.2.2 Part 4: Tasks and workload

4.1 Do you have a written job description?

4.2 Do you know what tasks are in your job description? Describe the tasks in your job description.

4.3 Do you feel that your job description is an accurate description of the work that you actually do each day? Describe any differences.

4.4 How do you feel about your work in terms of its load per day? (Probe for reasons)

4.5 How does your perception of the workload affect your performance in general?

4.6 What is your opinion of workload distribution among staff in this facility? Describe any differences. If there are differences, how does this affect performance and productivity?

4.7 In your opinion, who usually bears the burden of workload when there is a shortage of health workers?

1.1.3 Part 5: Performance and Productivity Support

5.1 Do you know who your immediate supervisor is?

5.2 How often does your supervisor discuss your performance with you?

5.3 Do you feel that your supervisor supports you in addressing the challenges you face in your job?

5.4 In general, do you have the supplies, drugs, and equipment you need to perform all of your job responsibilities? Specify what gaps you regularly have, including their frequency and duration.

5.4 Do you feel that you have adequate training for the tasks that you perform at this facility? If yes, identify any particular training that you have found particularly helpful in increasing your performance. If not, explain what additional training you feel you need.

5.5 Do you feel that the other workers in this facility provide the support that you need from them to be productive in your duties? Please describe.

5.6 Do you have any concerns about the safety of your working environment? Please describe.

1.1.3.1 Part 6: Work environment and motivation

6.1 How do you feel about your job? Are you satisfied with it?

6.2 What motivates you to remain in your post? Where do you see yourself in 3 years?

6.3 What do you like about your job? What would you like to change about it?

6.4 How do you cope with the shortage of health workers in your health facility? Does this involve any changes in tasks?

6.5 Some people are forced to supplement their salary by doing extra work. What are the ways in which you supplement your salary?

1.1.4 Part 7: Recommendations

What would you recommend to be done at facility level to improve the current state of limited health workers?

What would you recommend to be done at the district level so as to address the issue of limited HRH in your district?

What would you recommend at national level to be done so as to address the problem of limited HRH in Zanzibar?

Do you have any additional comments or recommendations that you would like to add to this interview?

Thanks very much for your participation in this study!!

Annex E: Observation Procedures

Health Worker Time Use Study Procedures

Background
The Zanzibar Ministry of Health and Social Welfare is committed to give priority to a set of health interventions that are cheap, effective and address main diseases and to make these interventions available to the great majority of Tanzanians. The aim of this research is to provide the MoHSW and the Capacity Project with information on the productivity levels of the existing health workforce, so that they may develop interventions to support existing health workers in increased productivity in the provision of health services. To do this we need to know how health workers make use of their time. Therefore, you, our research assistants from NIMR, will visit health facilities on the two islands of Unguja and Pemba and observe how health workers make use of their time (time studies).

1.1.5 Time Study: A definition

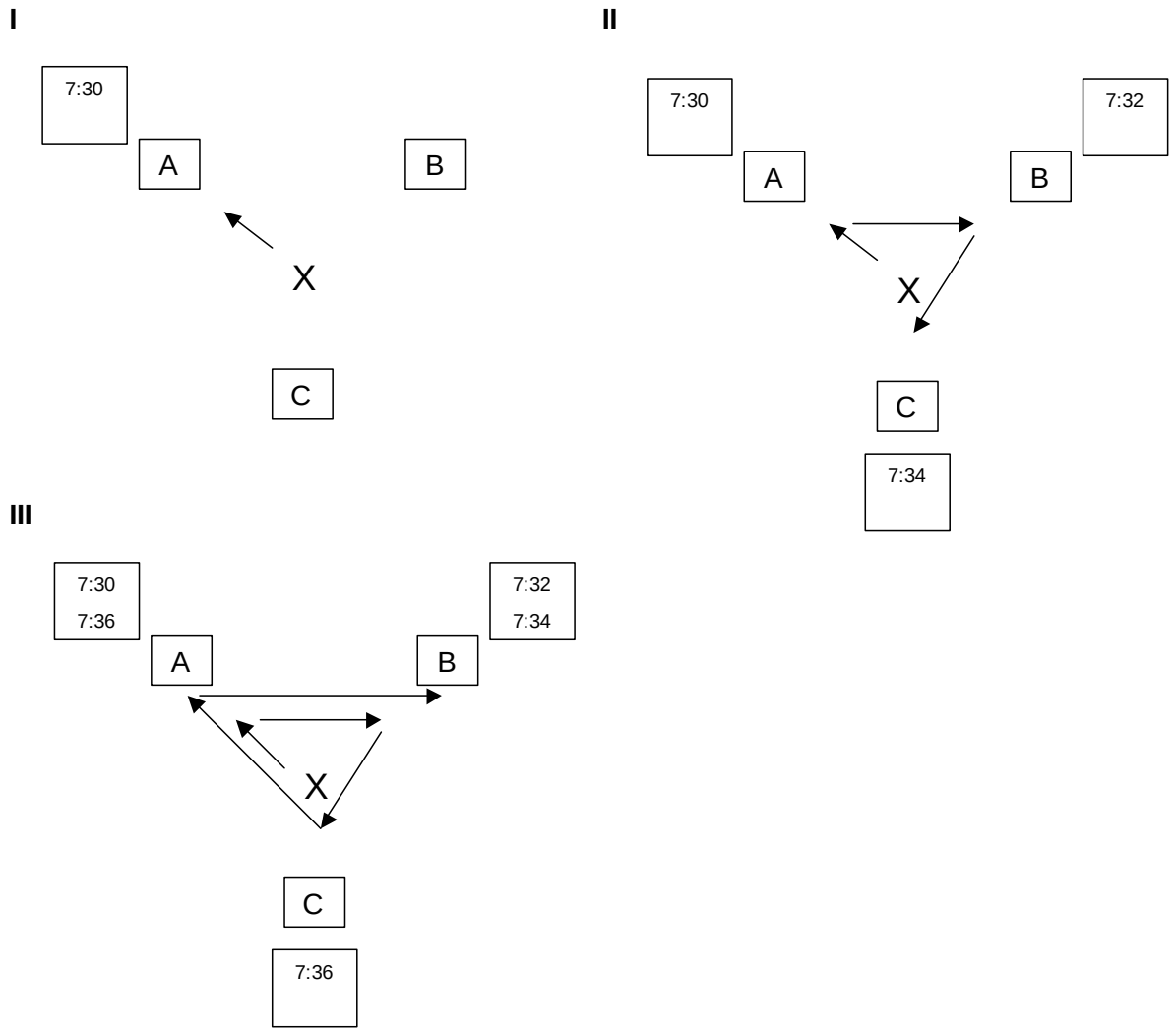
A trained observer follows between 2 and 3 health workers for an entire shift, recording actions at six-minute intervals. The observer uses a digital wristwatch to exactly determine the moment of observation. A pre-coded form is used to record what the health worker is doing exactly at the moment of observation.

1.1.6 Time study in more detail

Let's assume that 3 health workers (A, B, C) are observed in 6-minute intervals by observer (X), further, that the observation period starts at 7:30 a.m., the regular start of the morning shift (c.f. figure 1). At exactly 7:30 a.m., research assistant X (from now on called X) will observe and document what health worker A is doing at exactly that moment (I). Then, almost two minutes remain for X to walk to the workplace of health worker B. At exactly 7:32 a.m., X will observe and document what health worker B is doing at exactly that moment. Again, almost two minutes remain for X to move to another workplace, now to observe health worker C. At exactly 7:34 a.m., X will observe and document what health worker C is doing at exactly that moment (II). Now almost two minutes remain for X to return to the workplace of health worker A. At exactly 7:36 a.m. X will observe and document what health worker A is doing at exactly that moment. At this stage, the circular movement of observer X is completed for the first time. He/She now will continue with the observation of health worker B (III), then C, and again A and by this continue circular movements in a constant pattern. These constant movement patterns and observations have to be repeated over the whole period of the working time. Please note the resulting timetable for the observations of each health worker in figure 1. As the result of the constant and recurrent observation pattern, each health worker is observed every six minutes. However, observations take place every two minutes.

The observation itself is some sort of a snapshot, comparable to a photo fixing the activity of the health worker, exactly at the prescribed moment in time. It is important that the observation takes place exactly at the prescribed point in time (e.g. 7:32 a.m.). To do so, a digital wristwatch is required.

Figure 1
Time and motion study – the process of observation



In the following, a few thoughts on the act of observation. The observation should primarily be direct, or in other words, the research assistant should see what the health worker is doing exactly at that moment. Direct observation will sometimes require an intrusive behavior. For example, the observer has to enter a room where the health worker stays or works. The rigid time schedule of the time and motion study might not allow the observer to behave as courteous as it would normally be expected. For example, it will not be possible to wait some minutes in front of a closed door waiting for a sign to enter. Therefore, it is important that the observer and the observed health worker establish some ground-rules for their cooperation. For example, the health worker can indicate the rooms the health worker cannot enter without permission has been given. Similar, the observer should inform the health worker that his behavior might sometimes be straightforward and could appear rude.

As indicated, in some situations the direct observation of a health worker might not be appropriate. These situations will mainly occur in the context of a patient-health worker contacts. For example, the observer cannot enter the operating theater to observe the medical officer performing a caesarean

section. However, in almost all of these situations the observer will be able to know or guess the exact activity of the health worker, even though it takes place behind closed doors.

Whereas it is in some situations inappropriate to observe the health worker directly for reasons of courtesy or respect for patients, there might be circumstances where a direct observation should be avoided in order to prevent the research assistant from being exposed to an increased risk of infection. Possible scenarios should be discussed with the local health staff before the beginning of the time and motion study, - at the time when observer and health worker establish the ground-rules for their cooperation.

In the case of the exposure to an increased risk of infection, the research assistant should immediately consult a doctor in the health facility and inform the principal investigator.

1.1.7 The documentation

The time and motion study will be documented on pre-coded forms. Please use a separate form for each health worker that you will observe. Figure 2 shows the head of the documentation sheet.

Figure 2
The documentation form

					productive time							non procuctive time								other	total	default
												absence										
												explained			unexpl.							
	Time				patient contact/care	outreach activity	administration	meetings	training	cleaning, preparation, maintenance	personal hygiene	illness	collect salary	funeral	holidays	unexplained absence	waiting for patients	break	social visits/contacts	other	total - default excluded	default
	hr	min	min	min																		
	7	00	02	04																		
		06	08	10																		
		12	14	16																		
		18	20	22																		
		24	26	28																		
		30	32	34																		
		36	38	40																		
		42	44	46																		
		48	50	52																		
		54	56	58																		
1		Total																				
					A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R

In the pre-coded form, the four far left columns specify the timetable for the moments of observation. If you compare figure 2 and figure 1, you will find that each column resembles one of the timetables that we developed for health workers A, B, and C in figure 1. As you will use a separate form for each health worker, you have to decide which column is the appropriate timetable for each health worker. Please mark your choice by a cross in one of the boxes on top of the columns (figure 3).

Figure 3
Filling in the documentation form – step 1

					patient contact/care	outreach activity
	Time					
	hr	min	min	min		
	7	00	02	04		
		06	08	10		
		12	14	16		

Please mark here the timetable you chose for the health worker under observation.

It is important to remember that you have to choose a different timetable for each of the health workers you observe. Otherwise, you have to observe two health workers at exactly the same moment, what is technically not feasible.

The documenting process itself is straightforward. At each interval (e.g. 7:02, 7:08, 7:14, …) you will document the activity of the health worker in the appropriate column. Each column represents a category of activities that is specified by the title in the headline. For example, if you observe the health worker at 7:02 counseling a patient and at 7:08 and 7:14 doing administrative work, the documentation sheet should look as illustrated in figure 4.

At the end of each day, we would like you to summarize your observations. Please do that separately for each hour. You might have observed that the timelines in the documentation form are interrupted after each full hour by a row titled "total". Please use this row to document the sum of the observations for each activity category and each hour. In the column titled "total – default excluded", we would like you to document the total number of observations, again separately for each hour and each form. In this category exclude the missed observations documented in the "default" column. We will later define what we mean by missed observation.

Figure 4
Filling in the documentation form – documenting activities

					patient contact/care	outreach activity	administration
	Time						
	hr	min	min	min			
	7	00	02	04			
		06	08	10			
		12	14	16			

The Activity Categories

With respect to the use of health worker time, we generally differ between productive and non-productive time. Each of these two classes breaks down into various categories. As you see in figure 2, we have defined a total of 14 categories. In the process of the time motion study, you have to decide in which category each of the observed activities of a health worker falls. Please have a careful look at table 1 where we define and provide examples for each of the 14 categories.

Table 1
Activity categories – definitions and examples

Category	Definition	Examples
Direct Patient care	Direct interactions between a health worker and a patient as well as activities directly related to the care of patients	Physical examination Counseling Nurse Ana prepares an injection for a patient. Dr. Hassan discusses the correct dosage for a patient with pharmacist Mary.
Indirect care		
Outreach activity	The provision of clinically services on an outreach basis	Nurse Hilda spends a full working day providing immunizations in schools.
Administration	Activities that are related to the management and/or administration of the health facility	Dr. Abdullah reads the information sent by the district management team and writes a response.
Meetings	A **planned** meeting of two or more staff members in order to discuss issues related to their work	Nurse Ana briefs Nurse Maria about the developments on the ward during the night shift.
Training	A p**lanned** meeting of two or more staff members and/or external visitors to transfer knowledge	The District Medical Officer gives a presentation about a new anti-malaria drug.
Cleaning, preparation, maintenance	Activities related to the cleaning, maintenance and preparation of equipment or the rooms/buildings of the facility	Nurse assistant Hassan cleans the operating theater.
Personal hygiene	Activities related to personal hygiene	Dr. Salaam washes his hands after a consultation.
Illness	Absence due to illness	Nurse Ana is sick with malaria and stays at home.
Attend funeral	Hours or days of absence in agreement with the head of the facility that are considered as extra time off to attend a funeral of a close relative	Dr. Salaam attends the funeral of his mother. The head of the facility has granted an extra day off.
Holidays	Hours or days of absence in agreement with the head of the facility and in accordance with the regulations of the employees	In agreement with the head of the facility, nurse Ana has taken some days off to visit her family in the neighboring district.

	contract	
Collect salary	Time staff spends traveling and collecting the salary from a central facility	Laboratory technician Abullah travels to the district hospital to collect his salary.
Unexplained absence	Absence and colleagues in the health facility don't know why the health worker is not at work	Unexpectedly, nurse Ana did not appear at work at the beginning of the morning shift.
Waiting for patients	Time health workers spend waiting for patients without doing any other productive activity	Dr. Hassan is sitting in the consultation room, reading a medical journal while the waiting room is empty.
Breaks	Breaks from work for recreation or eating.	Dr. Abullah enjoys his lunch and reads the newspapers.
Social visits/contacts	Contacts with relatives and friends that are not related to clinical/medical work.	Dr. Joseph discusses with his wife over the phone what he likes to have for dinner.
Other		
Default		

We have tried to design the activity categories so that you hopefully will not face difficulties to decide in which category any of the observed activity falls. Table 1 provides you further guidance. Nonetheless, you might observe an activity that you might find difficult to categorize. In this case, please make your mark in the observation form in the column titled "others". Instead a tick, you should use a number to which you refer on the back of the sheet where you describe the activity you have observed.

Most of the activity categories are mutually exclusive, i.e. two activities cannot be done at the same time. However, this is not necessarily the case when health workers wait for patients. While waiting for patients, most of the health workers will pursue another activity. In order to decide how to classify the activity of a health worker while he is waiting for patients, please consider the following guidelines:

1. If the health worker is doing an activity we consider as productive, please document the productive activity rather than classify his work as waiting for patients.
2. If the health worker is doing an activity we consider as non-productive, please document that the health worker is waiting for patients.

The classification of activities in terms of being productive or non-productive is illustrated on top of the documentation form.

There might be circumstances where you are not able to observe health workers because you are not available - for example, you have to visit the bathroom. Under these circumstances please document the missed observations in the column titled "default".

1.1.8

1.1.9 The observation/documentation period

You will observe the same health workers for a period of 10 working days. The daily observation period is defined by the official working hours. Hence, you have to clarify the official working hours of staff before you can start the time and motion study.

The selection of health workers

We expect you to observe 2 or 3 health workers (depending on whether you are also observing the client load using form C) over a period of 5 working days. In some of the health facilities, the staffing level is low, perhaps limited to three or even fewer health workers. In this case, please observe all the health workers of the facility.

You might be allocated to a health facility with more than 30 health workers. Whenever the number of health workers in a health facility is greater than three, you will have to make a choice. This choice should be guided by some principles. First, you should observe staff from each of the professional groups presented in table 2.

Table 2
Professional groups

Group A	Group B	Group C	Group D	Group E
Medical Officer	Nursing Officer	Laboratory Technician	Pharmacist	Radiographer
Assistant Medical Officer	Midwives	Assistant Laboratory Technician	Assistant Pharmacist	Assistant Radiographer
Clinical Officer	Public Health Nurse	Laboratory Attendant	Pharmacy Attendant	Radiography Attendant
Assistant Clinical Officer	MCH aide			
	Nurse assistant			

Your choice should definitely include a staff member of groups A and B. Select the third health worker from group C, D, or E, if such a staff member is working at the facility. If not, choose a second health worker from group A or B. If you decide to observe more than 2 health workers of one professional group, it is preferable that you select health workers of different professional cadres within a group.

If the number of health workers of each of the professional cadres is greater than one (e.g. ten nursing assistants are employed in the inpatient facility of a health center), you have to choose the observant among them. In order to choose the observant randomly, pick the one whose last name starts with the letter you will find first in the following row:

N Q L A B Z O X U H K C R V P W J S F M T E Y D E G

If the last names of two health workers start with the same letter, base your decision on the second, third or fourth letter in the name. If the name is exactly the same, consider the first name.

In your choice of health workers consider primarily only full-time employees. If there is only a part-time employee representing a professional group or cadre in a health facility, select a different cadre or even different professional group.

In general, the selected persons should be observed over the whole period of 5 working days. However, health workers might rotate from the morning into the afternoon or nightshift. In this case, please select a substitute. However, these circumstances should be avoided by making sure that the health workers will remain in the morning shift at the beginning of the observation period.

Nursing staff in a hospital tends to rotate between shifts on a weekly basis. In this case, you should choose a different health worker for each week of the observation period.

1.1.10 Step by Step

1. Selection of health workers

Select the health workers you will observe according to the guidelines discussed earlier in this document.

2. Reaching the consent for the observation

Please read the consent form to the potential observant. Then, confirm verbally the consent of the health worker to participate in the interview.

3. Establishing the ground-rules

Establish ground-rules for the cooperation with the health workers you have selected.

4. The observation period

Start the observation period on the morning of a new day. Document your observations in the pre-coded forms. Summarize your observations at the end of each day in the rows titled "total".

5. The end

Please make sure that the health workers you have been observing understand how much we appreciate his or her cooperation in this research.

6. A final comment

You will spend more than one week with a handful of health workers. During this time, you will probably observe behaviors that fall outside the activities you are supposed to observe. Further, you might engage in discussions with the health staff and learn about their behaviors, attitudes and opinions that determine how they spend their time at work. We would be very grateful, if you will document all additional observations and experiences that might help us to understand how health workers spend their time, why so, what is their motivation to work, and what could potentially increase their motivation and job satisfaction. Please make your comments on an extra sheet and be ensured that we will study your additional observations and comments carefully.

Thank you for participating in this research project!

Annex F: Root Causes and Interventions, Low Productivity at the PHC Level

Root Causes and Productivity Rationale	Intervention(s)
Lack of time management guidelines at PHCU level Rationale: Clear procedures can provide guidance on appropriate use of staff/cadre time, particularly during periods of low patient load.	✓ Develop clear time management procedures for DHMTs and PHCU managers
Lack of supervision skills among facility managers Rationale: Adequate supervision can lead to more efficient resource management.	✓ Strengthen supervision systems ✓ Analyze on-site management capabilities ✓ Document needed improvements and initiate quality improvement process with DHMTs and supervisors ✓ Provide training to PHCU managers and DHMTs
Inadequate supervision guidelines and performance feedback at facility/district levels Rationale: Structured performance feedback can facilitate compliance with facility procedures and treatment guidelines.	✓ Complete and implement supervision checklist and guidelines ✓ Provide structured appraisals and feedback for provider performance
Failure to consider management skills when recruiting and hiring new positions Rationale: High-quality relationships between staff and supervisors can strengthen productivity.	✓ Provide training in management and supervision skills for clinical positions that include managerial responsibilities
Inadequate quality assurance processes at the PHCU and DHMT levels	✓ Create and implement quality assurance processes and standards
Absence of clear job descriptions Rationale: Clear job descriptions provide a basis for assessing individual performance and training needs. Job descriptions that focus on competencies (rather than tasks) provide flexibility in task assignment and team organization.	✓ Create job descriptions at the MOHSW level ✓ Distribute job descriptions to all PHC facilities and DHMTs ✓ Apply job descriptions to all health workers
Lack of adequate mentorship and on-the-job training opportunities for new providers Rationale: The ratio of experienced to inexperienced staff can be an important determinant of productivity.	✓ Establish opportunities and procedures for mentorship of new staff by experienced staff ✓ Provide regular in-service training opportunities
Inadequate continuing education (CE) opportunities for PHCU providers.	✓ Strengthen the CE unit within the MOHSW ✓ Review and update CE curricula on a regular basis
PHCU services offered by unqualified staff Rationale: Productivity and quality of care can be strengthened by ensuring that there are qualified staff to meet demand, with adequate training focused on primary care needs.	✓ Conduct PHC training needs analysis for all frontline health workers ✓ Develop and implement professional development plans for all PHC health workers

Note: Some listed interventions are already underway or planned as part of the ZHSRSP II.

Annex G: Data Tables

Average Percentage of Observed Time Spent Per Category, By Cadre

	Overall	Cadre					
		Doctor (n=2)	CO (n=5)	Nurse (n=23)	PHNB (n=11)	MCHA (n=7)	Other (n=17)
Productive							
Direct care	46	64	74	50	29	40	39
Indirect care	2	2	4	4	1	3	2
Outreach	3	0	3	0	6	4	6
Administration	4	7	2	4	5	8	2
Meetings	1	3	1	2	1	0	1
Training	1	0	0	2	0	2	0
Cleaning/Prep	3	2	4	3	3	4	5
Hygiene	<1	0	0	0	1	1	1
Unproductive							
Waiting for patients	20	4	3	17	27	22	26
Breaks	6	13	8	7	6	5	5
Social visits	1	0	0	2	2	0	1
Absence							
Illness	<1	0	0	1	0	0	0
Funeral	<1	0	0	0	0	2	0
Salary	2	0	0	3	4	0	0
Unexplained absence	5	5	1	5	6	6	7
Other	4	0	0	3	9	3	5

Average Percentage of Observed Time Spent Per Category, By Facility Type

	Type of Facility				
	1st Line PHCU (n=14)	2nd Line PHCU (n=9)	PHCC (n=3)	District Hospital (n=2)	Referral Hospital (n=2)
Direct Care	37.45	41.06	66.85	59.34	67.51
Indirect Care	2.51	.62	6.33	3.68	2.65
Outreach	5.71	.42	.07	.00	3.20
Administration	3.70	6.66	.95	1.04	5.05
Meetings	.77	.42	1.65	2.27	.00
Training	2.68	.57	.00	.00	.00
Cleaning/Prep	2.27	5.25	.70	.91	5.49
Hygiene	.13	1.27	.10	.15	.20
Illness	.70	.00	.00	.00	.00

	Type of Facility				
	1st Line PHCU (n=14)	2nd Line PHCU (n=9)	PHCC (n=3)	District Hospital (n=2)	Referral Hospital (n=2)
Funeral	.76	.00	.00	.00	.00
Salary	.92	4.19	.00	.00	.00
Unexplained absence	5.28	7.61	4.51	6.19	.60
Waiting for patients	26.06	19.81	10.05	15.24	2.29
Breaks	5.72	5.47	4.84	8.17	12.16
Social visits	1.37	.60	.00	2.64	.56
Other	3.96	6.04	3.94	.00	.00
Direct Care	.00	.00	.00	.00	.00
Indirect Care	.00	.00	.00	.38	.27

Percentage of Unproductive Time, By Cadre

	Cadre					
	Doctor (n=2)	CO (n=5)	Nurse (n=23)	PHNB (n=11)	MCHA (n=7)	Other (n=17)
Social visits	0	0	2	2	<1	1
Waiting for patients	4	3	17	27	22	26
Breaks	13	8	7	7	5	5
Unproductive Time	**17%**	**11%**	**26%**	**36%**	**27%**	**32%**

Average Productivity (%), By Facility Type

	Type of Facility				
	1st Line PHCU (n=14)	2nd Line PHCU (n=9)	PHCC (n=3)	District Hospital (n=2)	Referral Hospital (n=2)
Direct Care	37.45	41.06	66.85	59.34	67.51
Indirect Care	2.51	.62	6.33	3.68	2.65
Outreach	5.71	.42	.07	.00	3.20
Admin	3.70	6.66	.95	1.04	5.05
Meetings	.77	.42	1.65	2.27	.00
Training	2.68	.57	.00	.00	.00
Cleaning & Prep	2.27	5.25	.70	.91	5.49
Hygiene	.13	1.27	.10	.15	.20
Productivity %	**55.09**	**56.7**	**74**	**69**	**83**

Average Percentage of Time Spent Per Category, By District

	District									
	Unguja						Pemba			
	North A	North B	Central	South	Western	Zanzibar Town	Chake Chake	Michi weni	Mkoani	Wete
Direct care	50	39	39	35	47	68	48	67	54	45
Indirect care	2	6	2	1	1	3	0	19	3	1
Outreach	0	6	0	2	1	3	0	0	1	16
Administration	3	0	7	5	2	5	11	0	4	0
Meetings	0	1	0	1	2	0	1	0	1	1
Training	0	7	3	1	1	0	1	0	0	0
Cleaning/ Prep	2	3	5	1	7	5	5	2	1	3
Hygiene	0	0	0	1	1	0	0	0	1	0
Illness	0	4	0	0	0	0	0	0	0	0
Funeral	0	0	3	0	0	0	0	0	0	0
Holidays	0	0	0	0	0	0	0	0	0	0
Salary	0	1	0	0	2	0	13	0	0	2
Unex-plained absence	13	8	5	5	7	1	3	0	9	5
Waiting for patients	22	16	28	30	20	2	4	7	22	19
Breaks	3	4	4	9	4	12	12	5	2	1
Social visits	0	0	1	3	0	1	1	0	0	1
Other	5	4	3	6	4	0	1	0	3	6

Average Percentage of Productive Time Spent Per Category, By District

	District and Facility									
	Unguja						Pemba			
	North A	North B	Central	South	Western	Zanzibar Town	Chake Chake	Michi weni	Mkoani	Wete
Direct Care	50	39	39	35	47	68	48	67	54	45
Indirect Care	2	6	2	1	1	3	0	19	3	1
Outreach	0	6	0	2	1	3	0	0	1	16
Admin	3	0	7	5	2	5	11	0	4	0
Meetings	0	1	0	1	2	0	1	0	1	1
Training	0	7	3	1	1	0	1	0	0	0
Cleaning & Prep	2	3	5	1	7	5	5	2	1	3
Hygiene	0	0	0	1	1	0	0	0	1	0
Productivity %	**57**	**63**	**58**	**47**	**62**	**83**	**66**	**88**	**54**	**66**

Average Number of Patients in Waiting Area, By Day of Week

Day	Mean
Monday	16.3
Tuesday	13.0
Wednesday	11.5
Thursday	12.9
Friday	12.7

Average Number of Patients in Waiting Area, By Hour of Day

	N	Minimum	Maximum	Mean	Std. Deviation
7-	6	.2	64.5	14.4	24.8
8-9 am	21	1.0	50.9	16.3	13.5
9-10 am	28	1.1	58.4	22.0	16.5
10-11 am	29	.6	53.0	17.8	14.1
11 am -12 noon	29	.3	33.8	10.2	10.2
12 – 1pm	28	.0	27.7	5.8	7.3
1-2 pm	28	.0	17.0	3.4	4.7
2-3 pm	21	.0	16.3	2.8	4.5
3-4 pm	7	.0	3.6	1.2	1.3

Average Number of Patients in Waiting Area, By Facility Type

Facility Type	N	Min	Max	Mean	SD
1st Line PHCU	12	.68	26.03	6.42	2.33759
2nd Line PHCU	9	2.79	35.56	13.09	3.33850
PHCC	3	8.81	12.24	10.62	.99476
District Hospital	2	15.54	19.31	17.43	1.88400
Referral Hospital	2	26.10	29.46	27.78	1.68272
Maternity	1	-	-	9.97	-

The Capacity Project is an innovative global initiative funded by the United States Agency for International Development (USAID). The Capacity Project applies proven and promising approaches to improve the quality and use of priority health care services in developing countries by:

- Improving workforce planning and leadership
- Developing better education and training programs for the workforce
- Strengthening systems to support workforce performance.

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