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WORKING TO IMPROVE THE HEALTH OF WOMEN AND FAMILIES THROUGHOUT THE WORLD

technical report

A Performance and Quality Improvement Process to Improve Infection Prevention:

Malawi Case Study

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JHPIEGO, an affiliate of Johns Hopkins University, builds global and local partnerships to enhance the quality of health care services for women and families around the world. JHPIEGO is a global leader in the creation of innovative and effective approaches to developing human resources for health.

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ABBREVIATIONS AND ACRONYMS

ARV	Antiretroviral
CHAM	Christian Health Association of Malawi
FP	Family Planning
IEC	Information, Education, and Communication
IP	Infection Prevention
MOHP	Ministry of Health and Population
NGO	Nongovernmental Organization
NQATF	National Quality Assurance Task Force
PQI	Performance and Quality Improvement
RH	Reproductive Health
TOT	Train the Trainer
TRH	Training in Reproductive Health
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

The Malawi Ministry of Health and Population (MOHP) sought the assistance of JHPIEGO to implement a performance and quality improvement (PQI) initiative in infection prevention (IP), as one intervention in response to concerns of healthcare workers and potential healthcare workers regarding the existing risks of exposure to infection with major communicable diseases, especially HIV/AIDS, at the country's hospitals and other health facilities. The initiative aimed to improve infection prevention practices in seven participating (pilot) facilities, in order to decrease the risk of infection transmission to clients, providers, and the community.

A first activity conducted under the initiative was the development of national performance standards for infection prevention and development of a facility assessment tool based on these performance standards. A second activity was the collection of baseline data concerning perceptions of the risk of contracting infections and of the quality of health services among hospital staff, clients, and their caregivers (guardians) in several pilot facilities. Subsequently, additional baseline data were collected at seven facilities using the IP performance standards assessment tool. The performance standards were monitored over the course of 1 year. During this time, selected hospital staff from strategic areas of the participating hospitals were trained in appropriate IP practices, and IP information, education, and communication (IEC) activities were launched at four of the seven facilities to sensitize patients' guardians to the need for compliance with IP standards. An evaluation study to examine the implementation process and outcomes of these interventions over time was conducted 1 year post-intervention.

A comparison of findings from the baseline study conducted in fall of 2002 and the post-intervention evaluation study conducted approximately 1 year later reveals that the perception of risk of acquiring an infection because of working in or providing care for another person in the facility was reduced among both hospital staff and guardians. The perception of the quality of infection prevention practices at the seven facilities had also improved among both of these respondent groups.

Five groups participated in the evaluation study: 1) National Quality Assurance Task Force Members (government appointees), 2) members of the Infection Prevention Committee established in each of the participating facilities, 3) hospital administrators and managers (some of whom had day-to-day responsibility for the work of strategic facility units), 4) service providers, technicians, and support staff, and 5) guardians—those who act as caregivers for family and loved ones during the hospital stay.

Data indicate that people in upper level management groups (e.g., IP Committee members and hospital administrators/managers) were more optimistic about the improvements in IP practices that had been achieved in their facility, when their responses were compared with those offered by providers, technicians, and support staff. On the other hand, the two management groups were more reserved in assigning a highly favorable aggregate (group) rating of the quality of IP practices enacted in their facilities, when compared with the individual ratings received from the provider and the guardian respondents. The two administrative groups were also somewhat less likely to identify the root causes of good or poor quality practices, expressing a narrower view of issues and problems.

The two administrative groups also differed in their opinion about the factors that would influence continued progress toward high standards of practice when compared to provider and

guardian respondents. IP Committee members were far more likely to indicate that the worker and client cadres should take responsibility for sustaining progress ("show commitment to duty," "encourage clients to observe personal hygiene"). Both the IP Committee and the administrator/manager respondents were less likely to acknowledge the barriers that were encountered in day-to-day work (lack of supplies, insufficient staffing). The worker cadre was far less likely to perceive any personal reward to be derived from improving IP practices, although there is evidence of their awareness of the risks to clients and to self that were associated with the health conditions for which clients were hospitalized.

Patients' guardians viewed themselves as having the responsibility for maintaining personal hygiene and becoming educated on IP issues. This finding clearly indicates the importance of information sharing, and respectful client/guardian/provider interactions that facilitate the enactment of these IP self-care measures.

The ***Performance and Quality Improvement Process to Improve Infection Prevention*** intervention in Malawi demonstrated that IP best practices can be operationalized by local stakeholders and outside experts into practical, locally appropriate performance standards that clearly outline desired performance and are largely achievable by hospital staff without obtaining additional resources outside of their facilities. Findings further suggest that to change facility-based practices, there must be an enabling environment that includes supporting both human and material resources that permit the transfer of theory into practice. In other words, a supportive policy environment, at both national and institutional levels, is needed. Healthcare workers, managers, and policymakers must be committed to continued learning and self-assessment and willingness to change.

The need to disseminate the IP guidelines throughout the country of Malawi, and the need to support this effort with the provider and client education/community mobilization initiatives that will be necessary to make this effort both visible and viable, have already been identified. Initial efforts to develop a national accreditation system that acknowledges institutions that have met key IP quality standards need to be fully developed.

A PERFORMANCE AND QUALITY IMPROVEMENT PROCESS TO IMPROVE INFECTION PREVENTION: MALAWI CASE STUDY

INTRODUCTION

JHPIEGO, a not-for-profit international public health organization affiliated with Johns Hopkins University in Baltimore, Maryland, has been working globally for over three decades to improve the health of women and their families. The organization's work is client-centered, and spans the continuum of care from prevention to treatment, with a particular programmatic emphasis in the broad domain of reproductive health. JHPIEGO works collaboratively with partners at the international, national, and community levels to improve the accessibility and quality of reproductive healthcare.

JHPIEGO's mission is largely accomplished through technical leadership to build healthcare provider capacity for evidence-based health service delivery in low resource settings. The work is accomplished through assisting in-country professionals and government officials to:

- build capacity in the basic education and inservice training of health workers
- incorporate contemporary and cutting-edge technology into educational strategies
- develop and disseminate relevant and contemporary health policies

JHPIEGO's work in Malawi was initiated in fiscal year 2000 with field support funds provided by the USAID Malawi country office. The work was focused on advancing USAID/Malawi strategic objective 3: *behaviors adopted that reduce fertility and the risk of HIV/AIDS and that improve child health.*

JHPIEGO's infection prevention (IP) initiative in Malawi offers a case study that demonstrates the synergy achieved by application of several of JHPIEGO's core technical competencies within a specific programmatic focus area. It also demonstrates JHPIEGO's commitment to documentation of the outcomes of specific interventions that might be anticipated through programmatic scale-up.

COUNTRY PROFILE

The British protectorate of Nyasaland, established in 1891, became the independent nation of Malawi in 1964. The population is estimated to be between 10 and 11 million; eleven major ethnic groups are acknowledged. The people profess Protestant (55%), Catholic (20%), and Muslim (20%) faiths as well as indigenous beliefs. English and Chichewa are the official languages of the country; other languages are predominant in regional settings (Malawi MOHP 2003; Malawi NSO 2002).

Landlocked Malawi ranks among the world's least developed countries. The economy is predominately agricultural, with about 90% of the population living in rural areas, where access to high-quality healthcare is limited (Kulmala et al. 2000). **Table 1** depicts selected demographic and health indicators.

Table 1. Demographic and Health Indicators for Malawi

Indicator (Year 2000 or 2002 Estimates)	Statistic (Ranges indicated where sources vary)	
Demographic Indicators and Trends	**Statistic**	**Data Source(s)**
Population		
Population estimate: 2015 (in millions)	11.6–15.7	C, D
Life expectancy at birth (years)	38–40	C, D
Total fertility rate	6.1–6.7 children born/woman	C, A
Adult literacy rate (% age 15 and above)	60.1–72	C, B
Probability at birth of not surviving to age 60 (% of cohort)	66.2	B
Population below national poverty line (%)	54.0	B
Leading global health crises and challenges		
People living with HIV/AIDS		
adults (% age 15-49)	15	B, C
women (age 15-49)	440,000	B
children (age birth -14)	65,000	B
Malaria (cases per 100,000 people)	27,682	B
Tuberculosis (cases per 100,000 people)	229	B
Morbidity and mortality		
Infant mortality rate (per 1,000 live births)	104–117	A, C
Infants born at low birth weight (%)	13	B
Under-five mortality rate (per 1,000 live births)	182–189	C, A
Maternal mortality ratio (per 100,000 live births)	1,120–1,800	A, E

Data Sources:
(A) Demographic Health Survey, Measure and National Statistics Office, Malawi, 2002
(B) United Nations Human Development Report, 2003
(C) USAID Country Health Statistical Report: Malawi, 2003
(D) The World Fact Book—Malawi, 2003
(E) WHO/UNICEF/UNFPA, 2004

The vast majority of the Malawi people are under age 65. The country ranks 163rd (of 173) on the Human Development Index. The country's birth rate of 37.8/1,000 people is counterbalanced by an infant mortality rate of 104–117/1,000 live births, and a life expectancy of only 38–40 years (sources vary). The year 2000 Demographic and Health Survey documented a modest decline in fertility since the previous survey conducted in 1992, and a persistently high rate of unplanned pregnancy, although a steady increase in contraceptive use was also documented (DHS 2002; UNHDR 2003; USAID 2003).

Major childhood illnesses include acute respiratory infection and diarrhea (Vaahtera et al. 2000). Chronic malnutrition was prevalent among 49% of children under age 5. Major adult illnesses include malaria and tuberculosis (Chimzizi and Harries 2001; Harries et al. 2002). An increase in HIV/AIDS among the population has had an impact on the all-cause mortality rate for the country (Semba 2000; Taha and Gray 2000). Twelve to seventeen percent of the population between ages 15 and 49 and an additional 65,000 children are living with a diagnosis of HIV/AIDS (UNAIDS 2002).

PERFORMANCE AND QUALITY IMPROVEMENT PROCESS TO IMPROVE INFECTION PREVENTION PRACTICES IN MALAWI: AN INTERVENTION

The Malawian Ministry of Health and Population (MOHP) developed a *Health Sector Human Resources Plan* within the *Malawi National Health Plan 1999–2004*. JHPIEGO's contribution to the implementation of this plan has included activities related to preservice and inservice training of health professionals, development of a trainer followup system, development of reproductive health training materials, enhancement of provider capacity in postabortion care and emergency contraception, and the strengthening of performance and quality improvement (PQI) in IP, with a focus on both provider and client perspectives concerning IP.

The Malawi MOHP sought the assistance of JHPIEGO to implement a PQI initiative in IP as one intervention in response to concerns of healthcare workers and potential healthcare workers regarding the existing risks of exposure to infection with major communicable diseases, especially HIV/AIDS, at the country's hospitals and other health facilities. These concerns had begun to create an adverse impact on enrollment in the nation's nursing and medical schools. The initiative aimed to improve IP practices in seven participating (pilot) facilities, in order to decrease the risk of infection transmission to clients, providers, and the community (Mbweza 2000; Nyamogoba and Obala 2002).

JHPIEGO's technical leadership in the area of IP has been documented throughout two decades of work in similar endeavors around the globe (McIntosh and Tietjen 1996; Tietjen, Bossemeyer, and McIntosh 2003). Methods recommended for IP represent best practices in low-resource countries (Franco et al. 2002; Kilbride 2003; Nyamogoba and Obala 2002; Soule and Memish 2001), and incorporate the recommendations developed by international and infection prevention authorities and agencies (Carbon et al. 2002).

The first activity conducted under the PQI/IP initiative in Malawi was the development of national performance standards for IP, under the direction of the National Quality Assurance Task Force (NQATF) and the JHPIEGO technical leadership team. The standards, which were criterion-referenced to international standards established by the World Health Organization, the Centers for Disease Control and Prevention, and the Association for Professionals in Infection Control and Epidemiology, were pilot-tested in two hospitals in November 2001. Subsequent approval of the standards by the MOHP (March 2002) established the standards as government policy. The IP operational performance standards were used to create a checklist of performance standards to be used to measure facility performance. An excerpt from this clinical assessment checklist is included as **Appendix A**.

The invitation to the standards development workshop held in October 2001 was extended to staff from three hospitals along with representatives from the district and central levels of the MOHP, including members of the National Quality Assurance Task Force and the Office of the Controller of Nursing Services, for a total of approximately 50 participants. Workshop participants and their respective institutional affiliations are noted in **Appendix B**.

Dissemination of the IP operational performance standards was accomplished in a series of Train the Trainer (TOT) Workshops, sponsored by the MOHP and implemented by JHPIEGO. An initial 6-day workshop on IP practices was expanded at the request of the MOHP to include representatives from four additional facilities, in addition to the three original participating facilities, for a total of 30 representatives from seven institutions. A four-module training series in IP was held for these representatives. The trainers, in turn, disseminated lessons learned in their respective facilities, via on-the-job training activities. Performance and Quality

Improvement teams were established at each of the seven hospitals. Two distinct monitoring activities (i.e., followup assessments using the IP operational standards checklist) were conducted by the PQI teams at each facility.

Baseline Perceptions of Infection Prevention among Providers, Clients, and Guardians

The MOHP and other stakeholders recognized that IP is a process, based on pathophysiological principles of infection transmission and a set of behaviors that is reactive and responsive to that fundamental core of knowledge. It was also recognized that IP is intricately bound to a set of beliefs and perceptions that may be linked to these understandings, but may also be influenced by expectations, and/or traditional beliefs and practices.

JHPIEGO/Malawi commissioned a baseline assessment study to explore the perceptions and expectations of health service providers about quality of care related to IP (beliefs, perceptions of shortcomings and wrong practices related to safety, and risks for clients), perceived risks for health service providers related to IP practices, and needs (training, equipment, etc.) perceived by service providers as essential in order to foster safety in IP. A second objective of the study was to explore the perceptions and preferences of clients and potential clients (nonprofessional patient care givers/family members, a.k.a. “guardians”) about the quality of care related to hygiene and IP practices in the seven hospitals (needs, fears, beliefs related to hygiene and safety, or risk associated with hospital-based healthcare services). The study was implemented by Story Workshop, a local nongovernmental organization based in Blantyre, Malawi.

Individual interviews and focus group discussions served as the methods for data collection. The sample was drawn from two government-affiliated and one Christian Health Association of Malawi (CHAM) affiliated hospital, representing three geographic regions of the country. The 370 randomly selected respondents included 114 clients, 135 potential clients (guardians), and 121 service providers from central sterilization and supply department; operating room; isolation system; labor and delivery area; casualty, surgical, and medical wards; maternal and child health/family planning clinics; dental department; laboratory; and postmortem care. The support service areas from which study participants were drawn included administration, patient/client education, food preparation, laundry, and waste disposal.

The perception of personal susceptibility to infection was characteristic of more than two-thirds of each respondent group. Congestion on the wards and poor sanitary facilities were identified as the major sources of risk of infection in the hospital. Cholera and/or other diarrheal disease and respiratory ailments (flu, tuberculosis) were identified as the specific illnesses of concern. Health service providers were also concerned about the potential for transmission of HIV/AIDS and hepatitis B via contact with infected blood or body fluids.

The quality of IP activities within the hospital was rated as good by 65% of clients, 73% of guardians, and 73% of service providers. This favorable rating contrasted sharply with the results of a baseline survey conducted by the JHPIEGO team, using the IP operational standards assessment checklist, in which the highest score actually achieved by any of the three hospitals was 27%.

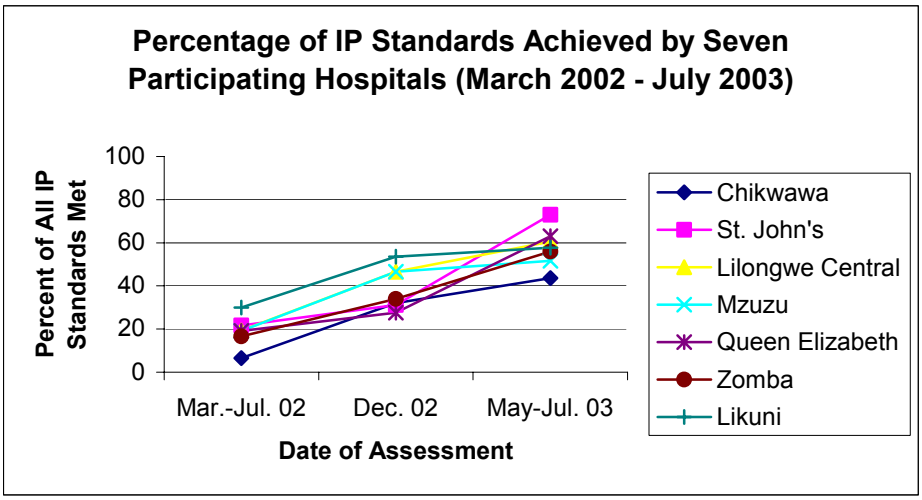
Barriers to implementation of high-quality IP practices and incentives for compliance were also explored. Findings from this study were used to help guide the performance and quality improvement process, which was the mechanism by which the IP guidelines were put into practice in participating institutions.

Monitoring the Process of Performance and Quality Improvement

Baseline assessments were conducted at each of the seven hospitals using the IP performance standards checklist as the data collection tool. Data were collected between March and July 2002. Two subsequent monitoring followup assessments were conducted over the course of the following year, in accordance with the PQI process. A first followup assessment occurred in December 2002 and a second followup assessment was conducted between May and July 2003. Findings at each time period were used to inform participants about progress made toward achieving the desired standards. When performance was judged as not meeting standards ("gap"), focused inquiry was initiated ("cause analysis") to identify the barrier(s) to best practice, so that targeted intervention activities could be designed to address the specifically identified problem (Caiola and Sullivan 2000).

Figure 1 below depicts the trend analysis from the baseline and two followup IP assessments conducted at the seven participating hospitals. Each hospital has demonstrated continuing progress in the achievement of IP standards over time. In six of the seven hospitals, there were dramatic improvements—from 30% or less of all IP standards met at baseline to 50%–70% met a year later.

Figure 1. Infection Prevention Standards Achieved by the Seven Hospitals From March 2002 to July 2003



Practice and support areas where most hospitals had made dramatic improvements in IP practices include: the maternal and child health/family planning outpatient clinic; central sterilization and supply; operating theatre; laundry unit; and postmortem areas. The two patient care service areas in which exposure to blood and bodily fluids is a likely event—operating theatre and labor and delivery ward—showed improvement over baseline, but five of the seven hospitals had not yet demonstrated optimal performance to standard (80% of standards achieved). The most consistent performance, across all seven hospitals, was in the postmortem service area. Each hospital achieved increasingly higher scores at both monitoring periods, compared to baseline, although only one of the hospitals achieved the desirable 80% standard of performance. Patient/client education was a consistently poor performing area, among all hospitals, across the three timeframes. Overall improvements in hospital IP practices included: decontamination of medical equipment using a chlorine solution, changes in traffic patterns, and improved handwashing procedures implemented by hospital personnel.

Important to note is that neither the MOHP nor JHPIEGO provided external technical or financial assistance after the training was completed; the changes resulted solely from training the PQI teams and providing them with the national IP standards document. Scores achieved by each facility at each of the three monitoring periods are presented in **Table 2**.

Table 2. Performance to Standard, by Service Area, at Baseline (Story Workshop) and Two Subsequent Monitoring Periods

Facility Service Area	Baseline (March–July 2003)	1st Monitoring Period (December 2002)	2nd Monitoring Period (May–July 2003)
Chikawawa District Hospital, Chikwawa (300 beds)			
CSSD and OR	8.3	43.2	54.2
Isolation systems	0.0	18.2	18.2
Labor and Delivery	8.0	22.2	33.3
C, S, M Wards	7.6	36.4	51.2
MCH/FP	0.0	18.2	63.6
Dental	0.0	35.7	42.9
Laboratory	8.0	52.9	64.7
Postmortem	0.0	16.7	58.8
Administrative	0.0	0.0	0.0
Patient/Client Education	0.0	0.0	25.0
Food Preparation	14.0	42.9	0.0
Laundry	16.3	33.3	50.0
Waste Disposal	0.0	40.0	0.0
TOTAL	6.6	32.0	43.6
St. John's Hospital, Mzuzu (215 beds)			
CSSD and OR	37.5	41.0	83.0
Isolation systems	0.0	0.0	63.0
Labor and Delivery	8.3	25.0	72.0
C, S, M Wards	15.4	50.0	84.0
MCH/FP	18.2	12.5	63.0
Dental	13.0	12.5	78.0
Laboratory	25.0	36.4	58.0
Postmortem	0.0	-	75.0
Administrative	0.0	0.0	50.0
Patient/Client Education	0.0	0.0	50.0
Food Preparation	0.0	50.0	71.0
Laundry	16.7	66.7	50.0
Waste Disposal	66.7	66.7	80.0
TOTAL	21.7	31.2	73.0
Lilongwe Central Hospital, Lilongwe (750 beds)			
CSSD and OR	4.2	67.6	73.0
Isolation systems	0.0	16.7	18.2
Labor and Delivery	25.0	16.7	44.4
C, S, M Wards	30.7	50.0	54.5
MCH/FP	16.6	50.0	77.3
Dental	20.0	-	93.0
Laboratory	16.6	52.9	64.7
Postmortem	0.0	25.0	58.3
Administrative	25.0	16.7	16.7
Patient/Client Education	0.0	0.0	50.0
Food Preparation	14.2	57.1	71.4

Facility Service Area	Baseline (March–July 2003)	1st Monitoring Period (December 2002)	2nd Monitoring Period (May–July 2003)
Laundry	83.3	100	100
Waste Disposal	25.0	40.0	0.0
TOTAL	19.3	46.6	60.6
Mzuzu Central Hospital, Mzuzu (320 beds)			
CSSD and OR	37.5	75.0	39.0
Isolation systems	0.0	0.0	27.3
Labor and Delivery	25.0	66.6	39.0
C, S, M Wards	7.14	6.66	63.6
MCH/FP	58.3	25.0	77.3
Dental	20.0	40.0	57.0
Laboratory	8.0	58.3	29.4
Postmortem	0.0	0.0	83.3
Administrative	0.0	25.0	0.0
Patient/Client Education	25.0	0.0	0.0
Food Preparation	28.5	85.7	85.7
Laundry	33.3	83.3	56.7
Waste Disposal	0.0	25.0	60.0
TOTAL	19.1	46.6	51.7
Queen Elizabeth Central Hospital, Blantyre (1,050 beds)			
CSSD and OR	12.5	16.7	64.9
Isolation systems	0.0	0.0	45.4
Labor and Delivery	25.0	25.0	61.1
C, S, M Wards	7.1	0.0	61.3
MCH/FP	58.3	33.3	81.8
Dental	20.0	70.0	71.4
Laboratory	8.0	41.7	58.8
Postmortem	0.0	0.0	66.6
Administrative	0.0	25.0	33.3
Patient/Client Education	25.0	25.0	75.0
Food Preparation	28.5	42.9	28.5
Laundry	33.3	33.3	66.6
Waste Disposal	0.0	50.0	80.0
TOTAL	19.1	27.6	63.1
Zomba Central Hospital, Zomba (427 beds)			
CSSD and OR	29.1	29.7	54.0
Isolation systems	0.0	27.3	27.0
Labor and Delivery	33.3	66.7	83.0
C, S, M Wards	0.0	27.3	41.0
MCH/FP	16.6	36.4	68.0
Dental	0.0	50.0	87.0
Laboratory	25.0	47.1	64.0
Postmortem	0.0	25.0	75.0
Administrative	0.0	0.0	33.3
Patient/Client Education	0.0	0.0	50.0
Food Preparation	14.2	28.6	57.1
Laundry	33.3	50.0	67.0
Waste Disposal	0.0	0.0	20.0
TOTAL	16.6	34.0	56.0

Facility Service Area	Baseline (March–July 2003)	1st Monitoring Period (December 2002)	2nd Monitoring Period (May–July 2003)
Likuni Hospital, Lilongwe (235 beds)			
CSSD and OR	31.8	75.7	62.0
Isolation systems	0.0	27.3	36.0
Labor and Delivery	16.6	66.7	66.7
C, S, M Wards	35.7	36.4	61.0
MCH/FP	54.5	57.9	40.9
Dental	20.0	57.0	50.0
Laboratory	25.0	52.0	52.9
Postmortem	-	25.0	66.6
Administrative	0.0	33.3	0.0
Patient/Client Education	0.0	25.0	0.0
Food Preparation	42.8	85.7	57.0
Laundry	33.3	83.3	83.3
Waste Disposal	75.0	60.0	80.0
TOTAL	30.0	53.5	57.7

Members of the Performance and Quality Improvement Team within each facility collected the followup data. Functional service areas randomly selected for review in this monitoring activity were:

- Central sterilization and supply department and operating room
- Isolation systems
- Labor and delivery
- Casualty, surgical, medical wards
- Maternal child health/family planning clinics
- Dental clinic
- Laboratory
- Postmortem
- Administration
- Patient/client education services
- Food preparation
- Laundry
- Waste disposal

Additional information exchange activities that have emerged as part of the intervention include public meetings at which the results of individual facility achievements documented in the followup assessments were discussed among stakeholders (primarily facility providers/administrators) and the conduct of site visits to high-performing facilities to observe best practice in action. Participants gained information about strategies that have been implemented in particular situations and might prove to be adaptable to their own service setting.

A promotional campaign was also designed to raise awareness about IP efforts within each institution. A system of individual, group, and service area awards (T-shirts, letters of commendation, tote bags, etc.) was developed to acknowledge achievements, in order to foster provider motivation and support the momentum for change. Community education and

mobilization activities to promote community awareness of and involvement in the PQI process were initiated by some of the hospitals.

Finally, a national recognition system has been crafted that will acknowledge facilities for achieving a required level of compliance with the standards. Achievement of standards is honored by both the district and central levels of the MOHP, through an official document from the MOHP and the awarding of a plaque or trophy to the institution. A symbolic monetary or in-kind award may also be given. The achievement will be made generally known by presentation of the award at a public ceremonial function and through the mass media. This recognition system is expected to evolve to a formal national accreditation process. External assessment teams have been trained to use the IP operational standards checklist, and are now conducting site visits to each institution to assess them against the recognition criteria.

LIMITATIONS OF THIS CASE STUDY

There are a number of limitations that should be considered when reviewing the information gleaned from this case study:

- The IP operational standards assessment tool developed for and used in the IP process assessments is a managerial tool, and was not intended for use as a research instrument.

  The clinical assessment tool does have content validity, as the instrument is based on existing documents developed by content experts in the IP field, and also on documents developed and disseminated by relevant professional agencies/organizations. However, because the tool is by nature a clinametric instrument, psychometric procedures used to demonstrate the internal, or construct, validity of the instrument are neither applicable nor appropriate. The inter-rater reliability of assessors who used the tool was fostered and documented.

- The IP operational standards assessment tool remains a work in progress.

  The process of crafting a user-friendly, content-relevant, and content-sufficient tool is ongoing. Several versions of the tool were used at any point in time, during the monitoring period. Percentage “performance to standard” reported for the baseline and three monitoring periods are, therefore, not based on data derived from an equivalent assessment instrument. One hundred and sixteen criteria were reflected in the first version of the instrument, developed in March 2002 and used for baseline assessments; 203 were included in the first revision, crafted in July 2002 and used for the internal monitoring assessments, and 207 were reflected in the second revised version, crafted in August 2003 and used for external verification purposes. There were, therefore, more or fewer items, and more or fewer critical items, within any particular assessment area, over time. Nevertheless, the demonstration of a positive trend toward better practices and performance to standard is encouraging.

- Both the monitoring and evaluation data are based on a convenience sample, and not all hospital service areas were included in the assessment process.

  A power analysis was not conducted to ensure the potential for generalizability of these data within the country of Malawi. However, random procedures were used in the selection of hospital service areas that would be included in the assessment process. Individuals

available on the days of the evaluation team's visit to the facilities were included in the analysis. These limitations reflect very practical considerations of resource constraints and time limitations.

- Data verification processes are not in place for the monitoring data.

  The use of the assessment tool, the calculation of "performance to standard" based on tool criteria, and the interpretation of these data were intended to serve as an intervention toward building local (Malawian) capacity for self-assessment. The data were never entered in a form that enables computer data verification or analysis. Original data forms remain available and data could be recomputed.

EVALUATION OF THE PQI PROCESS AND OUTCOMES

An evaluation study was designed as the next step in assessing the implementation process and results of the *Infection Prevention Performance and Quality Improvement* intervention. The objectives of the evaluation study were:

- to evaluate the PQI process and its use for improving IP practices, by examining commonalities and differences in the ways that the participating facilities applied the PQI process, and by identifying enabling factors and barriers to successful change; and

- to assess the outcomes of the PQI process, including staff satisfaction, motivation, and changes in policies and procedures.

Research Design, Methods, and Procedure

This evaluation is largely descriptive in nature and included primarily only post-intervention measures, although some baseline data were available for pre/post analysis. Structured individual and group interviews were selected as the data collection method.

Four interview guides were developed for this evaluation study. The interview guides were based, in part, on areas of inquiry that had been addressed in the baseline assessment conducted by Story Workshop, and in part on other information that concerned the expected outcomes of the PQI intervention. The instruments were developed in English, and two were translated into the Chichewa language: the Service Provider/Technical/Support Staff Interview Guide and the Guardian Interview Guide.

The instruments contained several common areas of inquiry, and the format of the questions was also largely congruent, including a mix of closed-ended (quantitative) and open-ended (qualitative) questions. Therefore, only one of the instruments (Service Provider/ Technician/Support Staff Interview Guide) was pretested for clarity, sufficiency, and ease of use at one of the participating hospitals. All instruments were revised, as indicated, following the pretest exercise.

Story Workshop supplied the research staff (local study manager, team leader, and three research assistants) for data collection and data entry for the evaluation. These consultants participated in a 1-day workshop where they were oriented by a JHPIEGO/Baltimore Research and Evaluation Office staff member to the purpose of the study, the method for obtaining

informed consent for study participation, and the nature of each study instrument. Data collection was carried out from August to October 2003.

Sample

The sample included the following individuals and groups: Interviews were conducted at all seven participating hospitals for the first four categories of respondents.

- Members of the National Quality Assurance Task Force (9 individuals)
- Hospital administrators/senior managers (7 groups; 23 participants in total)
- Hospital Infection Prevention Committees (7 groups; 52 participants in total)
- Healthcare providers, technicians, and support staff (105 individuals)
- Patient guardians (43 individuals)

A random selection of five client service and support areas was made from among the 13 areas that were assessed during the monitoring phase. Areas selected for inclusion in the evaluation phase were:

- Laboratory
- Surgical ward
- Labor and delivery
- Laundry
- Waste disposal

Interviews with patient guardians were conducted only in four of the seven hospital facilities where IP sensitization activities for guardians had begun. Guardian interviews were drawn from two of the five service areas named above, specifically, the surgical and labor and delivery units, as they are the only areas that provide clinical services to patients.

Table 3. Target Sample and Sample Achieved

GROUP INTERVIEWS		
Participant/Setting	**Target Sample in Each of Seven Hospitals**	**Sample Achieved**
Heads of Departments/Infection Prevention Committee Members	1 group interview (7–10 participants)	N=7
Hospital Administrators/Managers	1 group interview (3–4 participants)	N=7
INDIVIDUAL INTERVIEWS		
Participant/Setting	**Target Sample**	**Sample Achieved**
National Quality Assurance Task Force	All members	N=9
Participant/Setting	**Target Sample in Each of Seven Hospitals (N=105)**	**Sample Achieved (N = 105)**
Laboratory	1 lab technician 1 lab assistant 1 ward attendant/cleaner	2 lab in-charge/supervisors 6 lab technicians 6 lab assistants 7 lab attendant/cleaners
Surgical Ward	1 doctor/clinical officer 1 nurse 1 ward attendant/cleaner	1 deputy district health officer 1 senior lecturer 2 sisters in charge 6 clinical officers 4 nurses/sisters 4 patient attendants 3 ward attendants
Labor and Delivery	1 doctor/clinical officer 1 nurse 1 ward attendant/cleaner	1 head of department 1 district health officer 1 sister in charge 1 medical officer 4 clinical officers 6 nurses/sisters 4 patient attendants 3 ward attendants
Laundry	1 supervisor 2 support staff	5 laundry supervisors 16 laundry support staff
Waste Disposal	1 supervisor 2 support staff	2 environmental health officers 2 waste disposal supervisors 5 waste disposal support staff 2 mortuary attendants/ incinerators 1 boiler operator 9 ground laborers
Participant/Setting	**Target Sample in Each of Four Hospitals**	**Sample Achieved**
Guardians	12 individuals (N=84)	N=43

Appendix C contains a description of the individual interview respondent sample, by selected demographic characteristics and by job qualification. The table shows that among the 105 providers, technicians, and support staff interviewed in the seven facilities, primary job responsibilities included healthcare provider/service delivery (n = 26, 24.8%), clinical support functions (n = 17, 16.2%), other support staff (n = 58, 55.2%), administration/finance (n = 3, 2.9%), and waste management (n = 1, 1.0%). Three-quarters of the respondents (n = 76, 72.4%) had been employed in their job for more than 2 years; 43 of these 76 (41%) had been in their position more than 5 years.

Findings

National Quality Assurance Task Force

The perspective of members of the National Quality Assurance Task Force on the progress made toward achieving improvements in IP was of major importance, because they have assumed a leadership role in sustaining the enthusiasm and commitment for the IP initiative and the effort for country scale-up. Responses were obtained from nine individuals who represented the Ministry of Health and Population, the Malawi Nursing Council, and the Pharmacy, Medicines and Poisons Board. Four of these respondents had served in their respective positions for more than 3 years.

Perceptions of change

Each of the respondents indicated that they were aware of the pilot effort focused on the improvement of the quality of IP practices, but only one had personally participated in this process. All respondents were aware of the leadership responsibilities assigned to individuals at the hospital facilities to carry forth the improvement of IP practices, and agreed that the IP improvement process made a contribution to the achievement of Task Force objectives. Eight of the respondents had personally reviewed the standards document/clinical assessment tool that had been developed for the purpose.

- "*The aim of NQATF is to set standards, including IP and make sure they are being met. The main task is learning lessons from the IP improvement process."*

- *The national goal is total quality and IP is a large part of it."*

Four of the NQATF respondents had engaged in a discussion of performance gaps identified by the IP teams within any of the hospitals. However, few were aware of proactive interventions that had been taken to solve the problems ("gaps") identified at that facility. Respondents who offered an opinion indicated that the logistical and supply problems of which they were aware were local issues that could be solved by appropriate advocacy between local and central authorities for sufficient budget allocations and procurement policies.

The majority of NQATF respondents rated the quality of IP at hospitals across the country as poor (8 of 9 valid responses), although the majority (6 of 8 valid responses) believed that the quality of IP practices had improved at the seven facilities as a result of the IP improvement process. They based this opinion, in large part, on the results of the baseline and followup monitoring data that had been produced. There was concern that not all facilities had improved (which is not the case), and that the pace of improvement was unequal among the facilities, in spite of the perception that the availability of IP supplies had improved during the prior year. Respondents indicated that funding for these supplies was now reflected in the national budget, and was supported by existing or pending modifications in national policy that supported the IP effort.

> *"NQATF has adopted IP as part of their mandate—a written policy."*

Perceptions of risk

In spite of the generally positive attitude that IP practices were a more visible part of the national and local facility agenda, all NQATF respondents indicated that substantial risks to the health of clients in hospitals still remained throughout the country. The risk of exposure to blood-borne, viral, and bacterial contamination due to blood and body fluid contact (notably, HIV/AIDS, hepatitis B, and tuberculosis) was cited as a very real risk to providers as well as to other patients. Respondents uniformly rated the quality of IP practices as poor.

- *"There are not enough human resources, supplies or equipment to follow adequate IP practices nationwide."*

- *"At the other hospitals* [those not included in the IP initiative] *there has not been much emphasis on following proper IP procedures."*

Respondents mentioned lack of training in IP practices, the fact that the operational guidelines/standards had not been disseminated to all facilities, low staff motivation/morale, and challenges to waste disposal as additional barriers to better IP practices. Respondents indicated the value of the following interventions to improve the quality of IP practices at hospitals in the following order of priority:

- Show commitment to duty (4 endorsements among the 9 respondents)
- Have adequate staffing in all departments (3/9)
- Wards should be cleaned every day (3/9)
- Required infection prevention supplies should be available in sufficient quantities (3/9)

Other interventions that each received endorsement by two of the nine respondents were:

- Competitive salary package to boost hospital staff morale
- Provision of award for outstanding performance
- Sanitary facilities that are cleaned regularly and disinfected
- Clean beddings to be provided at all times
- Encouraging clients to observe personal hygiene
- Education of clients on IP measures
- Proper preparation and handling of food given to patients and guardians

"Recognize it is the right of the patient to be safe in a hospital."

NQATF respondents made the following suggestions about things that hospital administration/management should do to improve the quality of IP practices at hospitals:

- Motivate staff by giving awards…for good compliance to IP standards.
- Make IP a priority.
- Allocate appropriate resources [for necessary supplies].
- Participate in IP committees to have a better understanding of the impact of the program and the consequences of non-implementation…[do not] impede the flow of resources to the program.
- Do good resource planning and prioritize technical issues over administration issues.

They also cited the following responsibilities of the NQATF, in support of the initiative to improve the quality of IP practices at hospitals.

- Set IP standards; review these standards periodically for change; monitor hospitals for adherence to standards.
- Incorporate IP into the main Total Quality Assessment program at the ministry level.
- Establish a benchmarking program for assessing/improving quality at the district level; set up district QA teams.
- Ensure supportive supervision to reinforce compliance to IP standards.
- Advocate for adequate funding to health institutions.

NQATF respondents indicated that, to date, they had "*embraced the whole program as one that will lead efforts….*" and have endorsed the country-wide dissemination of IP standards and the institutionalization of IP practices in every health facility. They support the establishment of a quality assurance department at the Ministry level.

> "*All patients have the right to safe care.*"

Hospital Administration/Managers

The process of IP within a facility requires leadership and commitment to change. Hospital administration/management must make this commitment visible and viable. Visibility was supported in the IP pilot project through such things as encouragement for the establishment of IP Committees within the institutions, changes in hospital policies and procedures, provision of staff training, and creation of incentive programs designed to increase provider motivation and job satisfaction. Viability was supported in the IP pilot project through increasing the awareness of facilitators and barriers to implementation of best practices (e.g., budget and logistical supply issues).

Perceptions of change

Twenty-three administrative-level personnel participated in seven group interviews, conducted in the pilot IP initiative hospitals. *Group, rather than individual, responses are reflected.*

All respondents were aware of the IP standards and assessment tool that had been developed for the project, and introduced to their facility. All respondents (6 of 7 valid group responses) had personally participated in the IP initiative, and all seven had found the IP assessments useful.

Six of the respondent groups indicated that members had also participated in the discussion and analysis of gaps identified during the IP assessments. They acknowledged the existence of substantial barriers that inhibited the resolution of several gaps that had been identified. Financial constraints, which led to supply and staff shortages, were the overarching concerns. A raised consciousness about the longer-term impact of failure to take action to implement better IP procedures led to concerted effort to resolve the issues.

> *"From the results the departments were able to identify their weaknesses and improve them."*

Six of seven administrative/management groups indicated that the availability of IP supplies had improved over the past year. Two facilities had run short of decontaminating supplies; one facility had run short of protective wear, but none had run short of handwashing materials. This improvement was due, in part, to the incorporation of IP supplies into the budget of each of the facilities, and also into the national budget, from which some of these participant facilities received a monetary allocation.

Administrators and managers indicated that internal hospital policies had been changed, in support of the IP initiative, and respondents from five of the seven groups indicated that there had also been policy change at the national level related to IP. Policy changes that were of particular note, requiring policy directive and/or budgetary allocations at the national level included:

- Provision of *individual* IP supplies to healthcare workers and clients (e.g., individual hand towels)
- Restriction of the number of visitors per patient, leading to improvement of traffic flow through the patient care units and service areas
- Provision of antiretroviral (ARV) drugs to workers who were exposed to HIV through job-related injuries
- Creation of a new post within the ministry (Quality Assurance Office) with responsibility to protect both staff and the client environment.

Perceptions of risk

Despite these improvements to policy and practice, administrators/managers continued to perceive that there were risks to the health of patients in their particular facility. HIV/AIDS and tuberculosis were identified by this respondent group as the risks of greatest concern.

Respondents rated the quality of IP practices within their facility to be "good" (a rating of 3 on a scale of 1 to 4), and attributed that rating to improvements in IP practices, subsequent to provider and client education.

- *"**…**there is awareness of the importance of IP by service providers"*
- *"…the guidelines…have been put on walls all over this hospital."*

Respondents indicated that the quality of IP practices was adversely affected by the lack of availability of IP supplies, and positively affected when staff morale was high. Overall, they believed that the quality of IP practices had improved over time.

Respondents indicated the value of the following interventions to improve the quality of IP practices at hospitals in the following order of priority:

- Show commitment to duty (3 group endorsements among the 7 groups)
- Education of clients on infection prevention measures (3/7)
- Have adequate staffing in all departments (2/7)
- Encourage clients to observe personal hygiene (2/7)
- Provision of award for outstanding performance (2/7)
- Wear protective gear when discharging duties (1/7)

Promoting commitment to duty was perceived in common with members of the NQATF as a potential positive intervention to improve the quality of IP practices. Hospital administrators/managers, in contrast to NQATF respondents, tended to believe that their facilities were clean and sanitary (i.e., they saw less of a need to place emphasis on making improvements in this area).

The administrator/manager group believed that the NQATF had some overarching responsibility to assist facilities in the implementation of IP practices, but commented that the existence of this task force, and the identity of its members were not well known by employees at the facility level.

- *"They should come to monitor and evaluate IP work regularly and give us feedback."*
- "*They should have a national checklist of how hospitals are adhering to IP standards."*
- *"They should provide support with supervision – come visit quarterly. They should provide encouragement (instead of just talking about the negative side)."*
- *"They should introduce themselves to the hospitals because they are not well known."*

Including patients and guardians into the infection prevention process was accomplished at the facility level through the use of Information, Education, and Communication (IEC) materials on measures to prevent infection in five of the seven facilities, through group education/counseling sessions and through one-on-one education/counseling sessions in each of two facilities. Health talks on the wards (another model of group education) and peer-to-peer education between guardians were also mentioned as an implementation measure.

Motivation for positive change

Administrators/managers promoted the motivation of providers to pursue best IP practice through a system of rewards in all seven respondent facilities. These included transfer to a bigger hospital (6 of 7 groups responding in the affirmative), and/or awards at the department/service area level (5/7). Respondent groups from only two of the seven facilities cited an individual award program, either promotion or individual recognition (e.g., letter of commendation or monetary award). Administration/management cited few examples of serious disciplinary actions taken for poor performance. Dismissal or demotion was cited by four respondent groups. Verbal or written warnings or transfer to another department were more likely to be employed in the disciplinary process.

Respondents from this administrator/managers group were generally optimistic about the potential for sustaining a high level of consciousness about and commitment to best practices in IP over the longer term, provided that there was no disruption in the stream of supplies, and provided that efforts to educate staff and clients could be sustained. An ongoing program of internal assessments was cited as an important supportive measure.

"Promotion of team spirit has worked well for the process of IP improvement."

"… the perception of the hospital by the public has really changed. The community is really appreciating our work."

Infection Prevention Committee Members

Leadership at the facility level for this IP initiative was delegated, in part, to an Infection Prevention Committee. A subset of these individuals (30%–50%) participated in the TOT workshops, and, in turn, brought the standards and practices back to their own facility, through on-the-job training activities.

Perceptions of change

Fifty-two committee members participated in any one of the seven group interviews. Committee members represented the cross-section of focus areas targeted by the IP initiative (i.e., medical, surgical, and labor and delivery patient units, family planning and dental clinics, laboratory, laundry, mortuary, and food services). All heads of departments are members of the IP Committee. *Group, rather than individual, responses are reflected.*

The Infection Prevention Committees were formed in the respective facilities between 2001 and 2003 as part of the PQI initiative. Six of the seven committees met at least once a month; one committee met far less frequently (less than once every 3 months). Committee leadership was shared, and rotated among the members. When the committees were convened, the agenda focused on the results of internal assessments conducted in the various facilities and the progress of IP activities (i.e., "*voicing out problems faced in the IP process and finding ways of solving them").* Planning and coordinating motivational campaigns, such as interdepartmental competitions, were also noted.

All respondents were familiar with the IP standards assessment tool that had been developed for the IP project. Respondents had personally used the tool as a reference in support of IP efforts such the changes in IP procedures (e.g., frequency of cleanings, solutions to be used, waste disposal methods, personal protection practices) that had been introduced in their facility. A number of facilities had also established IP Committees at the departmental level, and offered the IP assessment tool as a guidance document.

All respondents had participated in either or both of formal (5 group responses out of 7) or on-the-job (3/7) IP training programs. Motivation for participation in the IP process reflected both professional and personal perspectives.

- *"We were interested in reducing the number of nosocomial infections at the hospital to both clients and service providers and support staff."*
- *"We were interested in improving the output of our services to make them infection-free for our clients."*
- *"I wanted to protect myself from infection and avoid contaminating our patients."*

All respondents had also participated in the baseline and/or monitoring assessments that had been conducted, using the IP standards assessment tool. Each respondent was personally responsible for a specific patient care or functional support center at the time of the assessment, and therefore cognizant of the relevance of the specific standards for the work/task area. In general, they found the results of the assessment to be useful. However, participants offered mixed reviews about the utility of the assessment tool.

- *"The tool was easy and straightforward to use. The language was simple and methods were well demonstrated."*

- *"Some words and methods that were used in the tool were not familiar to some assessors who are lay people."*
- *"The standards used were just too many for one department."*
- *"The tool is difficult because some departmental criteria have been combined."*

IP Committee member respondents had each (individually) participated in discussions of gaps identified through the assessment process. Committees were able to use their influence to use the results of these assessments to bring resolution to certain gaps, such as insufficient materials and supplies and poor traffic control on the units. Other gaps such as infrastructure constraints (e.g., lack of an incinerator, or a proper isolation unit) proved to be more difficult to manage, primarily because of the lack of funds sufficient to address the particular problem. Priority setting for problem solving was determined both by consideration of the contribution that solving the issue might have in promoting the IP process, and by considering what could be done with what was already at hand, and in the control of decision-makers.

> *"We considered the significance of the gaps; how important the materials to be bought were."*
>
> *"We solved the critical gaps. . . ."*

Specific actions taken in response to results obtained through the gap analysis process and from using the assessment tool included revisions to the language of departmental-level procedure booklets, procurement of critical IP supplies that had been identified as absent, and intensification of the IEC activities. One hospital IP respondent group made specific reference to the practice of separating sharps from other material waste products.

Making these improvements required intensification of staff training and greater levels of supervision in the departments. It also involved the seeking of additional/alternative sources for funds to augment the hospital budgetary allocations, amendments to the duties of staff personnel (e.g., posting a guard to set limits on access to certain strategic areas in the facility) and finding innovative ways and means to promote the IP message (e.g., displaying posters on the facility walls).

It was the perception of Infection Prevention Committee members that availability of IP supplies at their facility had improved (4 of 7 group respondents) or stayed the same (3/7) over the previous year. Supply shortages were experienced for protective wear (3/7), decontamination supplies (3/7), and handwashing supplies (3/7), even though purchase of IP supplies had been incorporated into the hospital budget in six of the seven facilities.

Committee members indicated that hospital polices had been modified to reflect newer/better practices that derived from the IP improvement process. Specific examples included the introduction of a hospital advisory committee to advise management on IP, the mandate that individual supplies be provided for each patient and each healthcare worker, and a limitation to the number of visitors and restriction of their movement within the facility. The provision of antiretroviral drugs to clients and healthcare workers, and the change to disposable rather than glass syringes, were cited as policy changes at the national level that were beginning to be implemented in the local facilities.

> *"Previously people thought the way things were being done was normal—there were no specific guidelines or standards."*

Perceptions of risk

IP Committee members continued to perceive a risk of infection to clients and to providers/staff in their facilities. Specific risks identified by respondents were similar to those cited by other respondent groups, indicating a rather universal awareness of the health challenges that were of priority concern for the country and the respective community. These included HIV/AIDS, tuberculosis, and cholera.

Nevertheless, they rated the quality of IP practices in their hospital to be "good" (score of 3). They attributed that rating to improvements in the supply pipeline, increased diligence in adhering to IP practices, and better education of staff and clients/guardians.

IP Committee member respondents concurred with the opinion of administrators/managers that the quality of IP practices had improved. Consistent with the views expressed by both NQATF members and administrators/managers, IP Committee respondents indicated that the quality of IP practices was adversely affected by the lack of availability of IP supplies. The positive impact of high staff morale was a view also held in common with the administrator/manager group. Notably, this factor was not considered to be of any importance by NQATF respondents.

IP committee respondents indicated the value of the following interventions to improve the quality of IP practices at hospitals, in the following order of priority:

- [Motivate staff to] show commitment to duty (6 group endorsements among the 7 groups).
- Educate clients on infection prevention measures (5/7).
- Provide awards for outstanding performance (4/7).
- Encourage clients to observe personal hygiene (4/7).
- Wear protective clothing (2/7).
- Provide clean bedding at all times (1/7).
- [Ensure that] required infection prevention supplies are available in sufficient quantities (1/7).
- [Ensure that] sanitary facilities are cleaned regularly and disinfected (1/7).
- [Ensure the] proper preparation and handling of food given to patients and guardians (1/7).
- *Respondents also suggested* that staff should participate in training (1/7) and apply what they have learned in that training (4/7).

Showing commitment to duty was held in common with the NQATF and administrators/managers groups as an important facilitating factor; but IP Committee members rated this factor very much higher than did the two other respondent groups. IP Committee members were, however, more likely to place responsibility for IP practices at the client/guardian level, when compared to both the administrator/manager and the NQATF respondents.

It was the opinion of the IP Committee Member respondents that hospital administration/management should do the following to improve the quality of IP practices in the hospital:

- Ensure that required materials and equipment are available to all departments.
- Maintain adequate staffing.
- Ensure an ongoing program of supportive supervision.

- Offer verbal appraisals and awards for good work.
- Maintain a positive attitude toward IP practices.
- Pursue the policy that ARV medications be available to staff and clients.

The IP Committee members also responded that the NQATF should assume responsibility for the following overarching activities:

- Advocating for/allocating appropriate resources
- Ensuring adequate staffing of the facilities
- Interpreting the role of the NQATF to IP Committees, and hospital administrators/managers, with respect to IP practices (*"They should tell management what their objectives are as NQATF")* and increase their visibility at the facility level.

Committee member respondents were even more supportive, when compared with administrators/managers, that effective ways of disseminating IP prevention materials to patients and guardians was through the use of IEC materials on measures to prevent infection (respondents from 6 of 7 facilities), through group education/counseling sessions (7/7), and through one-on-one education/counseling sessions (4/7). Health talks (group education) on the wards, drama groups, and use of electronic media were mentioned as effective communication measures.

Motivation for positive change

Committee members indicated the use of the following incentives to reward good performance in IP practices by service providers and other hospital staff: promotion (2 of 7 groups responding in the affirmative), ward/department level recognition (3/7), individual recognition award (1/7), and verbal affirmation (1/7). Consequences cited for substandard practices included verbal and written warnings, or transfers to other departments.

The vision of the future of IP practices, in the opinion of IP Committee members, was very positive.

> *"IP will continue if the government takes it seriously by continuing to train the staff and also supplying the materials to the hospitals."*

Service Provider/Technician/Support Staff

The infrastructure that is established in support of best practices in IP is a critical element of the enabling environment. Still, the day-to-day implementation of these IP behaviors is the responsibility of the technical support staff who prepare and/or process equipment and supplies, and the service providers who use these materials.

Perceptions of change

All but three of the 105 individuals interviewed stated that they were aware of the efforts to improve the quality of IP in the facility. A majority of the respondents (n = 76, 75.2%) were aware of and had seen (n = 61, 58.1%) at least one version of the assessment tool.

Almost all of the respondents (n = 94) had personally participated in the IP process at their facility, in one or more ways. Two-thirds of those interviewed (n = 69) had received training in IP between 2001 and 2003, through formal (1-week) classes (n = 17), or inservice/on-the-job training (n = 49).

Forty of the respondents (38%) had participated in the IP standards assessment process; 33 of these individuals (31%) were in charge/responsible for the unit that was being assessed (labor and delivery, casualty and surgical wards, central sterilization and supply department, maternal child health/family planning and dental clinics, laboratory, laundry, food preparation, and waste disposal).

Individuals' participation in the IP process also included acting as a role model in implementation of IP best practices, and teaching members of their service unit, then monitoring their performance of their IP-related duties. Teaching clients and guardians was also mentioned as a way to assist/promote the IP effort.

Individuals were motivated to participate in the IP process because they perceived this to be a professional responsibility, and also because they were able to identify the high priority that was being placed on the IP initiative by hospital management (supplies were more available, staff trainings were facilitated, IP activities were "compulsory by management"). Moreover, they were aware that these IP practices were likely to have an impact on the incidence of infection in their facility. They were empowered by their own ability to make changes that would have a positive benefit for themselves, their fellow workers, the facility in which they worked, and the clients whom they served.

- *"[I] wanted to reduce alarming reported cases of infection at the facility."*
- *"I saw that it was important for my life as well as lives of other people."*

Respondents who had used the IP assessment tool described the IP process as "simple and self-explanatory," "user friendly."

- "*The tool tells you what to do step by step."*
- *"…the standards were clear, observable and measurable and relate to our profession…"*

The vast majority (n = 92; 87.6%) found the results of the standards assessment activity to be useful, in the following ways:

- Consciousness was raised about infection hazards.
- New methods were initiated for disposal of sharps and contaminated materials/supplies.
- New voices were raised in advocacy with hospital administration for procurement and to sustain the supply of IP materials.

Three quarters of the respondents (n = 75) indicated that there was at least one person in their respective work area who played a key role in carrying out the IP improvement process. Actions taken by that person that could be specifically identified included:

- Conducting staff, client and guardian education (described as *"sensitization meetings")*
- Ensuring adequate supplies for the service support unit
- Serving as a role model to professional staff

Respondents (n = 77, 73.3%) could also identify an individual who acted in that same key role for the hospital facility. Actions taken by that person that augmented those cited above included:

- Assessing the work on IP in different departments, to motivate concurrent performance improvement throughout the facility
- Promoting equality among units in access to necessary IP supplies and equipment

The majority (n = 74, 70.5%) of individual respondents had personally participated in the discussion of factors identified as performance gaps during the assessment process. It was the perception that the facility had made progress in closing the gaps that had been identified, specifically, a knowledge gap with respect to IP best practices, the shortage of supplies and equipment, unfavorable "traffic patterns" in certain high-risk areas that increased the risk of infection transmissions, and (most often cited) the lack of proper waste disposal bins/incinerators.

Fixing these problems required both financial and personnel resources, such as coordination of budget requests, priority setting for materials acquisitions, taking action (such as controlling ingress and egress from the facility and/or unit) and continued assessment of staff training needs. Major barriers to finding solutions to problems were identified as lack of funds for facility renovation (including building of better waste disposal infrastructure) and a chronic shortage of staff well trained in IP practices.

Respondents indicated that the actual availability of IP supplies had largely improved (n = 80, 76.2%) or stayed the same (n = 20, 19%) during the previous year. Only five (4.8%) respondents had perceived that the situation had worsened. Stockouts had occurred in staff protective equipment (41% of respondents), and supplies for decontamination (40%) and handwashing (38.1%).

Respondents also had a sense that certain priorities had been set in their facility in the effort to address unmet needs:

- "*The knowledge gap was considered first to sensitize staff.…"*
- *"They considered the areas that were most crucial and required urgent attention…; those areas that were more risky and dangerous to the health of the staff.…"*
- *"They started with those that they use every day, e.g., gloves and chlorine"*
- *"They chose those that did not require any external assistance.…"*

Perceptions of risk

Three quarters of the service provider/technical/support staff respondents (n = 81, 77.1%) expressed the opinion that there was some risk to the health of clients and/or to their own personal health in their particular facility. The perception of risk reported at baseline (the Story Workshop study) was 96% to self, and 93% to clients; therefore, although still very high, risk perception may have been somewhat influenced by the IP initiatives that had occurred in the interim between the two studies.

The sources of risk named in common with other groups named above included respiratory disease (tuberculosis), fecal-borne contaminations (diarrhea, cholera) and blood-borne infections (hepatitis B, HIV/AIDS). This cadre of respondents, in addition, cited personal health risks of fungal disease (from touching unclean linens or the bodies of the deceased) and

nosocomial infections (bilharziasis, meningitis) acquired on the hospital ward or in the laboratory.

The vast majority of respondents, nevertheless, rated the quality of IP practices as very good (n = 26, 24.7%; baseline: 11%) or good (n = 69, 65.7%; baseline 73%), and indicated that quality had improved over time (n = 96, 91.4%). Only eight respondents (7.7%) gave a rating of poor or very poor, compared to the 17% baseline rating (16% poor; 1% very poor).

Respondents indicated that the quality of IP practices at their respective hospitals is:

- *"very good because health workers are more committed to promoting IP practices."*
- *"good because almost every staff member now realizes and understands the efforts being done to IP."*
- *"good because there's behavior change...towards IP practices.…"*
- *"poor because people are not sticking to simple IP measures like handwashing."*

The service providers were like other groups in acknowledging an improvement in the availability of IP equipment and supplies over the previous year. Two thirds (65.7%) of these respondents rated the quality of IP practices at their hospital to be good, and an additional 34.7% rated this as very good. These respondents, in contrast to the administrator/manager and IP Committee groups, attributed the improvement in the quality of IP practices equally to high staff morale and to the increased availability of material supplies. Staffing (either high or low) was not identified as a major factor that either inhibited or facilitated best practices in IP.

Specific comments concerning the IP process included:

- *"Both clients and staff have knowledge in IP and the importance of observing the standards."*
- *"Staff members are now following IP measures. They are applying what they have been taught from the trainings."*

The 105 respondents indicated the value of the following interventions to improve the quality of IP practices at hospitals in the following order of priority:

- [Motive staff to] show commitment to duty (47 endorsements).
- Educate clients on infection prevention measures (35).
- [Ensure that] required infection prevention supplies are available in sufficient quantities (28).
- Wear protective clothing (27).
- Encourage clients to observe personal hygiene (15).
- [Ensure that] sanitary facilities are cleaned regularly and disinfected (15).
- [Ensure] proper preparation and handling of food given to patients and guardians. (7).
- Provide awards for outstanding performance (6).
- Wards should be cleaned every day (6).
- Have adequate staffing in all departments (5).
- [Provide] competitive salary package to boost hospital staff morale (4).
- [Provide] clean bedding at all times (2).

Service providers echoed other respondent groups in endorsing personal responsibility and commitment as critical to the success of the IP process, while also acknowledging the important supportive role that clients/guardians must play. Effective ways to disseminate the IP message to clients were identified as IEC materials (n = 52, 49.5%), group education/counseling (n = 60, 57.1%), one-on-one education sessions (n = 42, 40%), health talks, and drama group performances.

Other IP interventions cited by respondents included monitoring of the IP process, frequent meetings and training, and fostering good relations between staff and clients. They believed that the role of hospital administration/management was:

- to facilitate the maintenance and upgrade of a supportive facility infrastructure, in which IP best practices could be effectively implemented
- to ensure the ready availability of supplies and equipment, though adequate budgeting
- to recruit, motivate, and retain staff, well trained in IP best practices

Respondents believed that the role of the NQATF at the facility level was to echo the request of hospital administration for adequate numbers and better trained staff and an uninterrupted supply of IP commodities, and also to promulgate the IP standards throughout the facility. Respondents believed that the *overarching* role of the NQATF was to promote IP policy as a professional and practice value. This advocacy for sustained movement toward the highest standards of IP practice could be accomplished by the NQATF through wide dissemination of the IP standards and through promotion of provider training and an incentives award (facility and provider recognition) program.

Motivation for positive change

Commitment to duty and staff morale were cited as important facilitating and motivating factors for IP. While 69.5% of individual respondents indicated that they were very satisfied or satisfied with their current job in the facility and that 76.2% were very satisfied or satisfied with the hospital's policies and support for IP measures, there is certainly room for additional improvement in these incentive areas.

- [I am satisfied with my job because] *"…the messages on IP have encouraged me to work extra hard knowing that I am working in safe conditions."*
- [I am not satisfied with my job because] "…*there are no rewards and incentives attached to the process."*
- [I am unsatisfied with this hospital's policies and support for infection prevention because] "*there is inconsistent availability of supplies, understaffing and underpayment*."

Less than half (n = 45, 42.9%) of the respondents were aware of any rewards for good performance. Awards given at the department/ward/area level were noted by 36 respondents (34.3%), but individual rewards of any sort (promotion, individual recognition, verbal acknowledgment) received only rare comment (14 citations among the 105 respondents). On the other hand, the consequences of poor performance were very well known among the respondents who cited dismissal, demotion, transfer to a smaller hospital, deferral of promotion, and verbal and written warnings. A total of 72 specific sanctions were cited. That these negative sanctions were rarely cited by the other three respondent groups, each of whom had some administrative oversight responsibility, should certainly be noted, as it represents a disconnect between administration and staff on this very important issue.

In summary, this cadre of respondents held a mostly positive vision for the future of IP practices at their facility, while acknowledging that there would be continuing barriers to sustaining best practices:

- *"The future is good, and IP will continue…"*
  - *"because staff have been equipped with knowledge.…"*
  - *"because the administration is now taking part in IP.…"*
  - *"if staff continue showing commitment to following IP standards.…"*
  - *"if management introduces rewards for good performance.…"*

- **"***Exchange visits should continue because we learn from our friends what they are doing at their facility.…"*

- *"The IP process has changed the working ethics at this facility."*

- *"The future will be dark* [because]*…."*
  - *"of lack of management commitment—they were involved because of* [extramural funds]*, but if they go, the process will not continue."*
  - *"it depends on the management to ensure the sustainability of the initiative.…"*
  - *"continuation will depend on continuous supply of equipment and materials, and continuous training of members of staff."*
  - *"less than a quarter of the staff have been trained so I don't think that the ones trained will manage to teach their colleagues."*
  - *"there is nobody who seems to be taking the program over."*

Guardians

Family members and other nonprofessional companions who provide bedside care to patients in hospitals in Malawi are called potential clients, or "guardians" for this report. Guardians augment the services provided by professional staff, assisting with aspects of personal care and nutrition.

Forty-three (43) guardians were individually interviewed for this evaluation. The guardians were caring for clients admitted to one of four of the seven participating hospitals (three government, one mission) in urban (3) and peri-urban (1) areas of the country. Two service areas (surgery and labor and delivery) are equally represented. Clients were admitted to both paying (n = 12) and nonpaying (n = 31) wards.

Demographic characteristics of the respondents (guardians) are detailed in **Appendix C**. Guardians had been serving as caregiver during the current hospital admission for 0-1 weeks (n = 31), 2-3 weeks (n = 7), or 1-2 months (n = 5). Almost one half of the respondents (n = 20; 46.5%) had previously visited the facility, either as a patient or as a guardian.

The IP initiative, including client education activities, had been ongoing in these facilities during that same time period. Three-quarters (n = 32; 74.4%) of the respondents indicated that they were familiar with the term "infection prevention," and expressed their understanding of the term in the following ways:

- *"Following practices that can help one to avoid contracting other diseases at the hospital."*
- *"Cleaning the surroundings and observing personal hygiene."*

- *"Taking proper cleanliness measures to avoid contracting infections."*
- *"Working hand in hand with the hospital staff in reducing the spread of disease."*

A majority of respondents (n = 32, 74.4 %) acknowledged that they had received information about IP practices during the time of the current hospital visit. The information was received via IEC materials (n = 5, 11.6 %), group education/counseling sessions (n = 23, 53.5%), and/or one-on-one education/counseling sessions (n = 5, 11.6%). Lessons learned by guardians about IP included the importance of cleanliness of the patient bedside areas, and the common facilities (toilets, bathrooms), and of proper waste disposal methods. The importance of handwashing after providing patient care and after personal toileting was also acknowledged.

The guardians expressed appreciation for having received the IP messages, and were generally very satisfied not only with the information that they received, but also with the manner in which the messages were delivered. Respondents from one of the four hospitals expressed a lesser degree of satisfaction, noting that the majority of IP messages that they had received had been conveyed by other guardians, rather than hospital staff:

- *"…when a person receives counsel they become knowledgeable and are able to change."*
- "*…it concerns my health, and if I follow the measures I will protect myself from infections."*
- *"..very satisfied with the way the messages were being conveyed through drama."*
- *"…the dramas were providing both good messages and entertainment."*

Perceptions of change

A majority of the guardians who had prior experience either as patient or guardian at the facility in which they were interviewed (a total of 20 eligible respondents) expressed the opinion that the quality of IP practices had improved (13/20, 65%). Respondents indicated that, compared to their previous visit(s), the wards and toilet facilities were cleaner, there were more disposal bins, and that they received more information about IP measures that they could personally enact.

Perceptions of risk

Most guardians rated the quality of health service delivery at the hospital to be good (n = 29, 67.4%). Others felt it was very good (n = 9, 20.9%) or poor (n = 5, 11.6%). The majority of guardians also rated the quality of IP practices at the hospital to be good (n = 33, 76.7%), with others rating it as very good (n = 4, 9.3%) or poor (n = 6, 14%). This demonstrates improvement over ratings obtained from the baseline study (73% good, 7% very good; 21% poor or very poor).

- *"Good, because the staff are following IP measures like washing hands."*
- *"Good because there is a change in hospital policies, e.g., guardians have been included in patient's safety."*
- *"Poor, because bathrooms are not enough…*[and]*…because bins are placed very far from the wards."*
- *"Poor because most guardians/patients are not following IP measures despite high intensification of awareness on IP by the staff."*

A smaller proportion of guardians felt themselves to be at risk of contracting an infection during the time of their hospital visit (n = 22, 51.2%), compared to 73% of guardians interviewed during the Story Workshop study. The respondents expressed their awareness of the same blood- or

fecal-borne and gastrointestinal infectious diseases named by professional caregiver respondents. They also indicated their awareness of the modes of transmission, citing "lack of isolation on the wards," "water that is left to stagnate," and "lack of protective gear" as risk agents. They cited the following risk factors, in decreasing order of importance:

- The toilets are not clean (13 citations elicited from the 43 respondents).
- The bathrooms are not clean (9 citations).
- The ward is congested (5).
- The bedding is dirty (5).
- The ventilation is poor (3).
- The wards are not cleaned and disinfected regularly (2).
- There is a frequent shortage of infection prevention supplies (1).
- The food is not well prepared (1).

Conversely, the perception of the presence of the following factors made guardians feel safe from contracting an infection during their hospital stay: lack of congestion on the wards, clean toilets and bathrooms (10 responses each), regular cleaning and disinfection of the wards (7 responses), and perception of an improvement in all other items listed above to a lesser degree (range of 1–5 responses to each additional item).

Guardians were asked to respond to the queries posed to other hospital administrative and staff/support personnel (including IP Committee members), regarding the factors that were likely responsible for the quality of IP practices that guardians observed. Their responses (see **Appendix D**) indicate a greater value on the importance of environmental cleanliness (beddings, sanitary facilities, wards) when compared to the responses of these three respondent groups, although guardian responses are quite similar to those expressed by NQATF members. Guardians also rated their own responsibility for being educated about IP measures and maintaining personal hygiene more highly than members of any respondent group other than IP Committee respondents. The importance of staff wearing personal protective equipment was rated very low, likely a reflection of the fact that they, as guardians, were not also protected in this manner.

In order to promote their own health and safety, or in order to reduce the risk of spreading an infection to the friend/family member for whom they were caring, guardians took the following measures:

Table 4. Infection Prevention Self-Care Actions Taken by Guardians*

IP Action	Actions Taken to Reduce Personal Risk		Actions Taken to Reduce the Risk of Spreading Infection	
	n *	%	n *	%
Wore gloves while emptying the patient's bedpan.	14	32.6	16	37.2
Wore gloves while washing the patient's soiled linen.	14	32.6	7	16.3
Washed hands after using the sanitary facilities (toilets)	10	23.3	12	27.9
Washed hands before and/or after serving food to the patient.	18	41.9	20	46.5
Washed hands before and/or after bathing the patient.	11	25.6	9	20.9

*Total of 43 guardian respondents

Guardians also noted that they could, or should, help to ensure that the hospital staff took appropriate IP measures by:

- *"building or creating mutual understanding with the providers and help them cleaning the hospital"*
- *"appointing one guardian to be the head who will be liaising with the service providers on IP efforts"*
- *"politely asking the health worker to follow the right protective measures"*

It is of concern that guardians also commented on a degree of "disconnect" between themselves and hospital workers that could act as a barrier to effective partnerships in IP.

- *"We can't tell them anything about cleanliness, we are afraid. All we can do is do our part to follow IP measures."*
- "*We cannot talk to the staff; it is not easy to convince them."*
- *"We can't tell them what to do; it's not our job to do so."*

Nevertheless, guardians' level of satisfaction with infection prevention-related services was generally favorable.

Table 5. Guardians' Satisfaction with Infection Prevention-Related Services

RATING							
Very Satisfied		**Satisfied**		**Unsatisfied**		**Very Unsatisfied**	
N	**%**	**N**	**%**	**n**	**%**	**N**	**%**
♦ How satisfied are you with the quality of food at this facility?							
4	9.3	13	30.2	6	14.0	1	2.3
The food they give us is: ♦ *clean* ♦ *well prepared and covered all the time* ♦ *not enough for both patients and guardians*							
♦ How satisfied are you with the sanitary facilities—toilets and bathrooms—at this facility?							
4	9.3	28	65.1	9	20.9	2	4.7
The toilets and bathroom are: ♦ *regularly mopped and disinfected* ♦ *not enough to be used by both patients and guardians* ♦ *locked because they got blocked* ♦ *so sophisticated that most people do not know how to use them*							
♦ How satisfied are you with the bedding and other linens at this facility?							
4	9.3	26	60.5	11	25.6	2	4.7
♦ How satisfied are you with the cleanliness of the wards at this facility?							
5	11.6	35	81.4	3	7.0	0	0
Wards are: ♦ *mopped…cleaned…disinfected daily* Windows are: ♦ *cleaned and open for ventilation*							
♦ How satisfied are you with the protective measures staff at this facility take, such as wearing protective clothing and washing their hands with soap, to prevent transmission of infection between patients?							
7	16.3	25	81.4	1	2.3	--	--
♦ *"The staff strive to follow IP measures so it shows that they are now concerned with not spreading or contracting infection."* ♦ *"I feel safe when they put on the protective wear and adhere to IP measures, e.g., handwashing."*							

Guardians offered these final, overarching, comments with regard to the IP initiative at the facility:

- *"I want to thank the hospital staff for their commitment to duty."*
- *"Cleaning the hospital surrounding or wards should be a shared responsibility between guardians and staff."*
- *"Both guardians and patients … have a greater role to prevent spread* [of] *disease by observing cleanliness."*
- "*This IP program should be applied in all hospitals."*

DISCUSSION

All stakeholders in the *Infection Prevention Initiative* in Malawi were committed to modeling best practices and improving the quality of IP activities in the seven participating hospital facilities. They were also committed to documentation of the outcomes of the pilot activities and to the identification of lessons learned in order to plan for future scale-up of this initiative.

Data derived from the monitoring and evaluation studies conducted at baseline, and over the time of the project, indicate the following:

- Infection prevention practices improved in all facilities.
- The pace of improvement was uneven when facilities were compared, one to the other, and also uneven when hospital service units were compared internally within each institution; nevertheless, the overall trend was an improvement in quality of practice.
- The PQI initiative was highly valued by hospital administrators, by professional staff and by technical/support staff, who could appreciate the added value of better practices to their own health and for the health of the clients they served.

A comparison of findings from the monitoring study conducted by Story Workshop in fall of 2002, and the evaluation study conducted approximately 1 year later, reveal that the perception of risk of acquiring an infection because of working in or providing care for another person in the facility was reduced among both service providers and guardians. The perception of the quality of IP activities had also improved among both of these respondent groups.

Appendix D presents a matrix of responses to questions that were asked in common among the respondent groups during the evaluation study. These data clearly depict the difference in perspective that is held by those in upper level management groups, when compared to those who function at the day-to-day service level. IP Committee members and hospital administrators/managers were somewhat more optimistic about the improvements in IP practices that had been achieved in their facility, when compared to the individual responses offered by providers, technicians, and support staff. On the other hand, the two management groups were more reserved in assigning a highly favorable aggregate (group) rating of the quality of IP practices enacted in their facilities, when compared to the individual ratings received from the provider and the guardian respondents.

The two administrative groups were also somewhat less likely to identify the root causes of good or poor quality practices, expressing a narrower view of issues and problems. Administrators expressed the opinion that all performance gaps could be solved; providers were less optimistic.

The two administrative groups also differed in their opinion about the factors that would influence continued progress toward high standards of practice when compared to provider and guardian respondents. IP Committee members were far more likely to indicate that the worker and client cadres should take responsibility for sustaining progress ("show commitment to duty", "encourage clients to observe personal hygiene"). Both the IP Committee and the administrator/manager respondents were less likely to acknowledge the barriers that were encountered in day-to-day work (lack of supplies, insufficient staffing). The worker cadre was far less likely to perceive any personal reward to be derived from improving IP practices, although a review of their narrative responses does indicate an awareness of the risks to clients and to self that were associated with the health conditions for which clients were hospitalized, similar to the findings of the study by Harries and colleagues (2002), conducted in district and mission hospitals in Malawi.

Patient guardians viewed themselves as having the responsibility for maintaining personal hygiene and becoming educated on IP issues. Their self-rating ranked second highest among the four comparison groups. This finding clearly indicates the importance of information-sharing, and respectful client/guardian/provider interactions that facilitate the enactment of these IP self-care measures.

Lessons Learned

Other studies of infection prevention and control practices have demonstrated that inter-institutional collaborations, and other partnerships, such as those tested and modeled in this Malawi project, have yielded great benefit to participants in achieving better IP practices (Cargon et al. 2002; Soule and Memish 2001). The IP improvement process must be supported by an enabling environment, both at the national policy and institutional procedural levels Nevertheless, day-to-day implementation of best practices in IP is the responsibility of the provider, who must not only *be* but must also *feel* supported in day-to-day efforts and activities.

- The availability of IP operational standards is fundamental to improving the quality of IP practices.
- Training of external evaluation teams to conduct the recognition process increases the objectivity of the process.
- Standards must be in the hands of those responsible for the process. Therefore, they need also to be usable (readable, sufficient, and not overly lengthy or complex).
- Public recognition and award for accomplishment at the hospital/departmental level should be augmented with a system of individual recognition of best and sustained personal efforts.

SUMMARY AND NEXT STEPS

The ***Performance and Quality Improvement Process to Improve Infection Prevention*** intervention in Malawi demonstrated that best practices can be facilitated. There must be a supportive policy environment, at both national and institutional levels. There must be an enabling environment that includes both human and material resources and permits the implementation of theory into practice. There must be a commitment to continued learning and self-assessment on the part of providers and also their clients. There must be an environment of respect that flows through all administrative, provider and client interactions.

The National Quality Assurance Task Force has already identified the need to disseminate the IP guidelines throughout Malawi, and to support this effort with the provider and client education/community mobilization initiatives that will be necessary to make this effort both visible and viable. Initial efforts to develop a national accreditation system that acknowledges institutions that are committed to sustaining best practices should be fully developed.

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APPENDIX A

EXCERPT FROM CLINICAL ASSESSMENT TOOL

Malawi Ministry of Health and Population National Infection Prevention Standards: Assessment Tool

Facility:
Date:
Supervisor/Assessor:

AREA: CENTRAL STERILIZATION AND SUPPLY DEPARTMENT (CSSD)

OBSERVED CRITERIA	VERIFICATION MEANS	[1]Y, N OR N/A	COMMENTS
1. There are written routines/ guidelines for IP practices in the CSSD.	Verify with the responsible person in the CSSD if: • There are **written** routines/guidelines for IP practices in this area including: - Traffic flow and activity patterns - Processing of instruments and other articles, including: decontamination, cleaning, sterilization and/or high-level disinfection (HLD) - Storage of sterile and high-level disinfected instruments - Maintenance procedures for the equipment - Monitoring of effectiveness of the sterilization process - Housekeeping • They are physically placed in this unit (posted and/or in a procedure manual).	_____ _____ _____ _____ _____ _____	
2. The traffic flow and activity patterns are according to the standards in the CSSD.	Verify if: • Traffic is limited to authorized personnel only • Personnel are required to wear surgical attire including head cover	_____ _____	

[1] Y = Yes; N = No; N/A = Not Applicable

OBSERVED CRITERIA	VERIFICATION MEANS	[1]Y, N OR N/A	COMMENTS
	• There is a receiving/clean-up area separated with a physical barrier (wall and/or door) from the processing area. • The receiving/clean-up area has: - A receiving counter - At least one sink with running water - A counter for instruments to dry • There is a clean work area for wrapping/packing with: - A large work table - Shelves for holding clean package - At least an autoclave and/or a dry heat oven • There is an area for storage of clean supplies, instruments and equipment with: - Shelves for storing clean equipment - Office desk for record keeping • There is an area to store sterile and/or high-level disinfected supplies, instruments and equipment with: - Limited access to the storage area or closed cabinets	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
3. The CSSD is clean.	Observe when visiting the CSSD the absence of blood, dust, soil, debris, trash, insects and spider webs in the following sites: • Floors • Walls • Ceilings • Windows • Chairs • Sinks for clean-up • Tabletops and counters • Ledges and any other flat surfaces • Trolleys • Storage area • Toilets and bathrooms	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	

OBSERVED CRITERIA	VERIFICATION MEANS	[1]Y, N OR N/A	COMMENTS
4. The process of cleaning instruments and other items is performed according to the standards.	Observe if the person cleaning the instruments complies with the following steps and recommendations: • Wears: - Utility gloves - Head cover - Mask and eyewear protection **or** face shield - Plastic apron - Gumboots • Utilizes: - Soft brush - Detergent (liquid or powder) • Scrubs instruments and other items under the surface of water, completely removing all blood and other foreign matter. • Disassembles instruments and other items with multiples parts and cleans in the grooves, teeth and joints with a brush. • Rinses the instruments and other items thoroughly with clean water. • Allows instruments and other items to air-dry, or dries with a clean towel. • Washes hands after removing gloves: - Washes hands with running water and soap for 10–15 seconds and dry with an individual clean towel, paper towel or allows hands to air-dry, **or** - Rubs hands with 3–5 ml of an alcohol-based solution until the hands are dry (if hands **are not** visibly soiled)	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	

Total of criteria	
Total observed	
Total achieved	

APPENDIX B

PARTICIPANTS IN MOHP NATIONAL INFECTION PREVENTION STANDARDS DEVELOPMENT WORKSHOP (OCTOBER 2001)

Chikwawa District Hospital

- Ms. F. Chauluka
- Mrs. E. Chunga
- Mrs. G. Kondwerani
- Mr. G. Manjolo
- Mrs. D. Masautso
- Mrs. V. Mkukumira
- Mr. S. Mmangisa
- Ms. M. Mpahuwa
- Mrs. E. Mphande
- Mrs. S. Senga
- Mr. N. Thonje

Lilongwe Central Hospital

- Mrs. O. Chilunga
- Mrs. H. Chipeta
- Mr. G.D. Gamadzi
- Mrs. G. Kabambe
- Mrs. L Kitalo
- Mrs. A.A. Kukasha
- Mrs. E. Malikha
- Mrs. O. Matola
- Mrs. S. Msokera
- Mrs. I. Mtemwende
- Mrs. M. Munthali
- Mrs. E. Mwenelupembe
- Mrs. F. Nkhonjera
- Mrs. D. Nyirongo

Malawi College of Health Sciences, Zomba Campus

- Ms. M. Kawonga

Medical Council of Malawi

- Mr. E Gumbo

Nurses and Midwives Council of Malawi

- Ms. R. Mbvundula

St. Johns Hospital

- Mrs. E. Banda
- Mrs. J Jere
- Mrs. M. Kamanga
- Mrs. Kate Kaunda
- Mr. E. Kawonga
- Mr. V. Shaba

Reviewers (August 2003)

CBQ Project

- Mr. Enued Sandfore Gumbo

Christian Health Association of Malawi

- Miss Desiree Mhango

Lilongwe Central Hospital

- Mrs. Fannie Kachale
- Mrs. Felesia Samuel Chawani

Malawi College of Health Sciences, Blantyre

- Mrs. Agness Kamanga
- Mr. Edwin Tony Wochi

Malawi College of Health Sciences, Zomba

- Mrs. Nanzen Kaphagawani

Ministry of Health and Population

- Mrs. Maria Damarisy
- Mrs. Davies Macdonald Mlotha
- Mr. Edward Thomas Kataika
- Mrs. Ann Maureen Phoya

Queen Elizabeth Central Hospital

- Mrs. Tulipoka Soko

APPENDIX C

DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT SAMPLE

Table C-1

Characteristic	**N**
Seven (7) interview sites	
Level of facility	
Central hospital	4
District hospital	1
Other	2
Location of facility	
Urban	5
Periurban	1
Rural	1
Type of facility	
Government	5
Mission	2

Table C-2

National Quality Assurance Task Force Committee Members	**N**
Respondent's employer	
Malawi Nursing Council	1
Ministry of Health & Population	7
Pharmacy, Medicine and Poisons Board	1
Sex	
Male	6
Female	3
Qualifications of respondent	
Registered nurse/midwife	2
Doctor/Medical officer	3
Administrator	1
Technician	1
Other	2

Table C-3

Administrator/Manager Respondents	N
Sex	
Male	13
Female	10
Qualifications of respondent	
Enrolled nurse/midwife	1
Registered nurse/midwife	10
Clinical officer	1
Doctor/medical officer	7
Administrator	4

Table C-4

Infection Prevention Committee Respondents	N
Sex	
Male	17
Female	35
Qualifications of respondent	
Enrolled nurse/midwife	13
Registered nurse/midwife	11
Clinical officer	4
Support staff	9
Administrator	2
Technician	9
Medical assistant	2
Doctor/medical officer	2

Table C-5

Service Providers	N	%
Level of facility		
Central hospital	60	51.1
District hospital	15	14.3
Other	30	28.6
Location of facility		
Urban	75	71.4
Peri-urban	15	14.3
Rural	15	14.3
Type of facility		
Government	75	71.4
Mission	30	28.6
Sex		
Male	64	61.0
Female	40	38.1
Missing data	1	1.0

Table C-6

Guardians	N	%
Sex		
Male	5	11.6
Female	38	88.4
Age		
Less than 15 years	0	--
15-24 years	6	14.0
25-34 years	11	25.6
35-49 years	17	39.5
50 or older	8	18.6
Missing data	1	2.3
Education		
Never attended school	10	23.3
Attended primary school	19	44.2
Attended secondary school	12	27.9
Attended post-secondary school	2	4.7

APPENDIX D:

MATRIX OF RESPONSES

	NQATF	Administrators/ Managers	Infection Prevention Committee	Service Provider/ Technicians/ Support Staff	Guardians
	Denominator				
	9 individuals	**7 groups***	**7 groups ****	**105 individuals**	**43 individuals**
Query	**% Yes**	**% Yes**	**% Yes**	**% Yes**	**% Yes**
♦ Has the facility solved any gaps identified during the gap analysis?	22.2	100	100	81.9	N/A
♦ Were there any gaps that could not be solved?	44.4	100	100	61.0	N/A
♦ Has availability of infection prevention supplies, over the past year:					
Stayed the same	11.1	14.3	42.8	19.0	N/A
Improved	55.5	85.7	57.1	76.2	N/A
Worsened	11.1	0	0	4.8	N/A
♦ Have there been stockouts within the last six months of:					
Staff personal protective equipment (e.g., gloves, masks)	N/A	14.3	42.8	41.0	N/A
Decontaminating supplies (e.g., chlorine powder, JIK)	N/A	28.6	42.8	40.0	N/A
Handwashing supplies (e.g., soap, towels)	N/A	0	42.8	38.1	N/A
♦ Have infection prevention supplies been incorporated into the hospital's budget?	N/A	100	85.7	N/A	N/A
♦ Have any internal hospital policies related to infection prevention been added or modified as a result of the infection prevention improvement process?	N/A	100	71.4	N/A	N/A
♦ Have any policies at the national level related to infection prevention been added or modified as a result of the infection prevention improvement process?	66.6	71.4	42.8	N/A	N/A

	NQATF	Administrators/ Managers	Infection Prevention Committee	Service Provider/ Technicians/ Support Staff	Guardians
	Denominator				
	9 individuals	**7 groups***	**7 groups ****	**105 individuals**	**43 individuals**
Query	**% Yes**	**% Yes**	**% Yes**	**% Yes**	**% Yes**
♦ Do you perceive any risks to the health of your clients/ patients in this hospital [in the country]?	100	100	100	77.1	N/A
♦ How would you rate the quality of infection prevention practices at this hospital [at this hospital in the country]					
Very good	0	0	0	24.8	9.3
Good	0	100	100	65.7	76.7
Poor	88.8	0	0	6.7	14.0
Very poor	0	0	0	1.0	0
♦ What is responsible for the good or poor quality of infection prevention practices?					
Lack of adequate equipment	44.4	0	0	8.6	9.3
Availability of adequate equipment	11.1	0	57.1	38.1	41.9
Shortage of infection prevention supplies	66.6	0	0	6.7	2.3
Availability of infection prevention supplies	0	57.1	85.7	40.0	30.2
Low staff morale	55.6	0	0	2.9	2.3
High staff morale	0	85.7	57.1	39.0	58.1
Low staffing	55.6	0	0	14.3	2.3
Adequate staffing	0	14.3	14.3	2.9	14.0
Other reasons	55.6	0	42.8	25.7	0
♦ Has the quality of infection prevention practices improved in the past year at your facility as a result of the IP improvement process?	N/A	100	100	92.3	N/A
♦ What do you think the service providers and other hospital staff should do to improve the quality of infection prevention practices at this hospital?					
Have adequate staffing in all departments	33.3	28.6	0	4.8	7.0
Competitive salary package to boost hospital staff morale	22.2	0	0	3.8	2.3
Provision of award for outstanding performance	22.2	28.6	57.1	5.7	2.3

	NQATF	Administrators/ Managers	Infection Prevention Committee	Service Provider/ Technicians/ Support Staff	Guardians
	Denominator				
	9 individuals	**7 groups***	**7 groups ****	**105 individuals**	**43 individuals**
Query	**% Yes**	**% Yes**	**% Yes**	**% Yes**	**% Yes**
Wear protective clothing when discharging their duties	44.4	14.3	28.5	25.7	2.3
Show commitment to duty	44.4	42.9	85.7	44.8	30.2
Clean beddings to be provided at all times	22.2	0	14.3	1.9	25.6
Wards should be cleaned every day	33.3	0	0	5.7	14.0
Sanitary facilities should be cleaned regularly and disinfected	22.2	0	14.3	14.3	20.9
Required infection prevention supplies should be available in sufficient quantities	33.3	0	14.3	26.7	9.3
Encourage clients to observe personal hygiene	22.2	28.6	57.1	14.3	44.2
Education of clients on infection prevention measures	22.2	42.9	71.4	33.3	60.5
Proper preparation and handling of food given to patients and guardians	22.2	0	14.3	6.7	9.3
Other	88.9	28.6	71.4	39.0	0
♦ Are there any rewards for good performance by service providers and other hospital staff?	44.4	100	71.4	42.9	N/A
♦ What rewards are given?					
Promotion	0	14.3	28.5	5.7	N/A
Transfer to a bigger hospital	0	0	0	0	N/A
Good performance award given to department/ward/area	33.3	71.4	42.8	34.3	N/A
Individual recognition/award	11.1	28.6	14.3	6.7	N/A
Other	11.1	14.3	14.3	1.0	N/A
♦ Are there any consequences for poor performance by service providers and other hospital staff?	44.4	85.7	85.7	59.0	N/A

	NQATF	Administrators/ Managers	Infection Prevention Committee	Service Provider/ Technicians/ Support Staff	Guardians
	Denominator				
	9 individuals	**7 groups***	**7 groups ****	**105 individuals**	**43 individuals**
Query	**% Yes**	**% Yes**	**% Yes**	**% Yes**	**% Yes**
♦ What are these consequences?					
Dismissal	22.2	42.9	14.3	15.2	N/A
Demotion	0	14.3	0	2.9	N/A
Transfer to a smaller hospital	0	0	0	1.9	N/A
Promotion deferred	0	0	0	1.9	N/A
Other	33.3	71.4	71.4	46.2	N/A

* Administrators/Managers were interviewed as a group. The total number of respondents in the seven groups = 23.
** Members of the Infection Prevention Committee in each facility were interviewed as a group. The total number of respondents in the seven groups = 52.