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# Medical Injection Safety Program – Namibia

## End of Project Independent Assessment

### Attachment A

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#### **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of University Research Co, the United States Agency for International Development or the United States Government.

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## LIST OF ACRONYMS

AIDS	Acute immunodeficiency syndrome
ARV	Antiretroviral
BCC	Behavior Change Communication
CMS	Central Medical Store
HIV	Human immunodeficiency virus
M&E	Monitoring and Evaluation
MOHSS	Ministry of Health and Social Services
MSH	Management Sciences in Health
PDSA	Plan, Do, Study, Act
PEP	Post-exposure prophylaxis for HIV
PEPFAR	President's Emergency Plan for AIDS Relief
QA	Quality Assurance
SIGN	Safe Injection Global Network
TB	Tuberculosis
URC	University Research Co., LLC
WHO	World Health Organization

# 1 EXECUTIVE SUMMARY

This five-year project funded by USAID/Washington under the PEPFAR program, undertaken by the Ministry of Health and Social Services (MOHSS), University Research Co., LLC (URC) and partners, successfully improved injection safety in Namibia. Expanding from 5 regions to 13, the project wrote and/or distributed policies on waste management, infection control, injection safety, HIV Post Exposure Prophylaxis (PEP) and treatment guidelines. An estimated 8,500 health care workers were trained in injection control and quality assurance. The project flexed to meet locally identified injection safety issues including risk of HIV transmission during phlebotomy, hepatitis B for healthcare workers, needlesticks during episiotomies, and use of sharps by traditional circumcisers.

Rates of needlestick, injection practices and prescribing practices all improved. For example, sharps containers that were only seen in 2% of 32 hospitals at baseline were present in 95% of 167 facilities reporting by the project's end. The project provided more than 350,000 safety boxes and incorporated the tender and provision of boxes and colored bin liners into the central medical stores' ordering system. The presence of used needles and sharps on the facility grounds decreased from 62% of facilities to 6%. The average number of injections ordered per person per prescription declined from 1.4 to 0.5. HIV PEP was reportedly made available to all hospitals and health centers and many smaller health clinics; it was available at all sites visited. Workshops were created to *Nurture the Caregiver* and provide emotional support to those exposed. Staff reported they were more willing to request PEP if exposed to blood and body fluids. The number of needlesticks reported in both anonymous and name-based reporting declined. Re-use of syringes was not detected at baseline, and was not present at the project's end. During the project period, the MOHSS incorporated hepatitis B vaccine and AD syringes into their immunization program. The project tried to rely on, and nurture, local and regional staff. The provision of supportive supervision from on-site facility representatives with regional URC staff who had MOHSS support was mentioned as being effective, successful and appreciated.

While the objectives were successfully met, several processes could be improved. Additional communication to between MOHSS, NGO partners, and URC staff would have strengthened the work. The central monitoring and evaluation system overwhelmed the small staff, although the facility-level audit system was useful. Since MOHSS is in the process of tendering for the safety boxes, there are concerns whether the safety boxes will be available before the URC supplied boxes run out. The staff successfully conducted many well-received trainings and workshops, but had difficulty transitioning to apply the knowledge in quality assurance collaboratives.

The work and training in quality assurance accomplished in this project can form an enduring basis for subsequent work in infection control, Many staff recommended that future work target the prevention of respiratory infections especially, MDRTB. Future assistance in sterilization and disinfection and help addressing the next steps in medical waste were also requested. The hard work of the staff, consistent support of the MOHSS and partners should be applauded.

## 2 OBJECTIVES

The objective of this report was to provide an end of project assessment for the URC's Medical Injection Safety Project in Namibia. The aim was to answer the following questions:

- What problems did the project and partners try to improve?
- What did the project do?
- What changed in the five years of the project?
- What was learned?
- What are the next steps?
- What is the next horizon?

To evaluate the project, URC was asked to select facilities for site visits from the best performing regions, the worst performing region and one in between. Approximately 12 facilities were eventually visited in four regions (Oshakati, Rehoboth, Oshana, Karas). Interviews were conducted with staff from the Regional Director's office and those in charge of infection control, hospital supervision (control nurses) and waste management. Staff and students encountered during facility tours were also asked about the project and their practices observed. Partners from EPI, WHO, Occupational Health, the TB Program, Management Sciences for Health and the MOHSS Quality Assurance program were interviewed. Prior reports were reviewed and the centrally reported data from the quarterly facility reports for 2008 was checked against primary source documents. URC's regional coordinators were sometimes contacted to clarify conflicting data.

The initial picture of injection safety in Namibia was compiled from the baseline assessment in 2004 (National Injection Safety Project, Report on Rapid Assessment of Current Injection Practices in Namibia 31 May-09 July 2004, authors MOHSS, URC and University of Namibia). This will be referred to in the remainder of the document as the Baseline Assessment. For this, 32 hospitals were visited. This is supplemented with the facility assessment data from 2005 when facilities first joined the project (reported in the 2008-2009 Workplan submitted September 24, 2009). The first phase of the project included hospitals and primary health care centers in five regions in Namibia (Khomas, Karas, Erongo, Oshana and Omaheke).

At the end of project assessment, in August 2009, some 327 facilities were participating in the project and 51% of facilities, hospitals and clinics had submitted a facility assessment for Jan – Mar 2009.

### 3 WHAT PROBLEMS DID THE PROJECT TRY TO IMPROVE?

The goal was to prevent the transmission of bloodborne pathogens by improving the safe and appropriate use of injections in healthcare facilities.

In the face of global concern about re-use of syringes in health care facilities, USAID, CDC and WHO had developed a standard injection safety assessment, policy platform, and an intervention package that diverse countries could use to prevent the transmission of HIV in health care facilities. New technologies such as AD syringes provided an engineering solution to reduce re-use of syringes and needles. The U.S. Government provided much needed funding via PEPFAR to test these approaches at scale. This report documents the successful efforts of the Namibian Ministry of Health and Social Services (MOHSS), URC and partners to apply PEPFAR funding to improve injection safety. This report chronicles the lessons learned, the successes achieved.

**Injection Safety in Namibia at Baseline and Project Completion:** Tables 1-3 on the following pages shows the status of the injection safety indicators in Namibia when the project began. Data is compiled from the baseline survey of 32 hospitals and from the facility audits conducted as institutions joined the project. **Column E** shows the status of injection safety in the final year of the project as of the second quarter of FY 2009 for the 167 facilities which turned in a report. The estimated number of facilities in the country is 327.

**Table 1: Status of Injection Safety Indicators: Policies and Commodity Management**

A: Question Number on Quarterly Facility Assessment	B: Indicator	C: Baseline Assessment Tool C conducted in 32 hospitals 2004 interviewing approx 117 HCW <sup>2</sup>	D: Initial facility assessments, 5 regions, 2005 (2008 report) <sup>1</sup>	E: Jan-Mar 2009: % of facilities reporting (N=167)
<b>A Policies Present in the Facility:</b>				
1	Written Waste Management	22%		63%
2	Infection Control Policy	28%		84%
3	PEP guidelines	38%	35%	93%
4	Standard Treatment Guidelines	57%		94%
<b>B Commodity Management</b>				
1	Sufficient needles and syringes in stock	100%	100%	95%
2	Protective clothing for waste handlers			71%
3	Stock cards used to manage supplies			85%
4	Stock outs on one or more oral antibiotics			29%

- 1 Quarterly assessment data from facilities enrolled in the project initially, as reported in the *Medical Injection Safety Program, Namibia: 2008-2009 Workplan*, submitted September 24, 2008. The number of facilities in the denominator 'N' is not known.
- 2 N is variable and reported when known.

**Table 2: Status of Waste Management Indicators**

<b>A: Question Number on Quarterly Facility Assessment</b>	<b>B: Indicator</b>	<b>C: Baseline Assessment Tool C conducted in 32 hospitals 2004 interviewing approx 117 HCW<sup>2</sup>C</b>	<b>D: Initial facility assessment s, 5 regions, 2005 (2008 report)<sup>1</sup></b>	<b>E: Jan-Mar 2009: % of facilities reporting (N=167)</b>
<b>C</b>	<b>Waste Management</b>			
1	Waste containers according to standard	65% had a sharps container of any type including box	2%	95%
2	Waste containers replaced when 3/4 full			95%
3	Waste Containers emptied and reused	Observed at baseline	Observed at baseline	5%
4	Waste containers stored in place with no public access			90%
5	Access to functional incinerators			55%
6	Sharps seen outside facilities	62% of 55	62% of 55	13%

- 1 Quarterly assessment data from facilities enrolled in the project initially, as reported in the *Medical Injection Safety Program, Namibia: 2008-2009 Workplan*, submitted September 24, 2008. The number of facilities in the denominator ‘N’ is not known.
- 2 N is variable and reported when known.

**Table 3: Status of Injection Safety Indicators: Injection Practices and Availability of PEP**

A: Question Number on Quarterly Facility Assessment	B: Indicator	D: Baseline Assessment Tool C conducted in 32 hospitals in 2004 <sup>2</sup>	C: Baseline facility assessments, 5 regions, 2005 (2008 report) <sup>1</sup>	E: Jan-Mar 2009: % of facilities reporting (N=167)
<b>D</b>	<b>Injection Process</b>			
1	Syringes and needles taken out of sterile package for each injection			91%
2	Needles always removed from vials between each injection	33%	47%	93%
3	Medication stored and prepared in clean designated areas	18%		91%
4	Injection reconstituted with sterile diluents from single use vials	Use of IV fluids observed at baseline	53%	93%
5	Use of barriers (e.g. cotton) while opening vials/ampoules			93%
6	Injection sites of patients cleaned with relevant solution before patients are injected			95%
7	Patients hold cotton wool swabs on injection sites after being injected			80%
8	Used needles, syringes, scalpels blades or other sharps seen outside of disposal containers where they could cause injury	13%		5%
9	Staff wash hands before and after procedures		61%	92%
10	Staff discard needles without recapping	61%		94%
<b>E</b>				
1	Staff know they should tell supervisor			93%
2	Staff, including cleaners, know PEP should start ASAP and not later than 72 hours			89%

**Since the baseline survey in 2004, the most remarkable change in the health system has been that that no re-use of syringes and needles was seen recently, and no facilities were sterilizing needles and syringes for general use. This represents a significant achievement of the MOHSS in the past five years.**

Having achieved the key goal in injection safety – preventing reuse – the MOHSS wished to continue to improve injection safety by addressing other issues present before the project began. Policies and procedures for HIV PEP, Infection Control, waste management and treatment protocols were not available in the facilities in 2004. There were no standard sharps waste containers in use; staff created ones from empty boxes and containers or purchased and reused plastic ones. Many facilities were emptying sharps containers by hand, which increases the risk of needlesticks to staff. Waste was not systematically segregated. Used sharps were visible both inside facilities, and outside facilities on the grounds. Needles were commonly left in vial medications, which can increase the risk of contamination. Medications were not always prepared in dedicated areas, and opened liters of IV fluids or other multi-dose vials were used to reconstitute medications, which can increase the risk of contamination or even sepsis. Storage, transport and destruction of waste were problematic.

Regarding the use of personal protective equipment, only 72% of the health care workers wore gloves when drawing blood, and only half wore gloves when suturing episiotomies. Incinerator workers and waste handlers largely did not have access to gloves, goggles, or impervious aprons, although some did have cloth overalls.

Recapping, which increases the risk of needlesticks, was observed, which is of concern since approximately 15-20% of the general population were estimated to be HIV+ in 2003. Staff recapped needles, especially phlebotomy needles. Midwives reported needlesticks during deliveries. When needlesticks occurred, staff said they did not feel comfortable reporting and occasionally commented that they preferred to pay the private sector for Post Exposure Prophylaxis for HIV (PEP) rather than risk disclosing one's HIV status to peers and employers. Mortuary and laundry staff at one facility reported that before the project began, their supervisor charged them for care of occupational injuries. Some facilities, including smaller clinics did not have the PEP medication on hand and did not have a clear procedure for use. Staff were concerned about their risk of contracting HIV at work, and expressed concern about the stigma of having HIV if tested.

The risk of needlesticks also put staff at risk for hepatitis B infection. The existing MOHSS policy was that hepatitis B vaccine should be available to health care workers. However, outside of Windhoek hospitals, staffs were not routinely being vaccinated since the purchase of vaccine fell to the individual facility budget and did not often survive the “efficiency committees” charged with the difficult task of prioritizing expenses.

The baseline survey and other data gathering efforts also looked at the appropriate use of injectable medications. While widely acknowledged to be a problem, consistent data was not to measure the magnitude of unnecessary injections. The Baseline Assessment reported when patient records were audited in 32 hospitals that the mean number of injectable medications prescribed per person was reported to be 14.5 injectable drugs per person, which is difficult to believe. However, the audits of facilities joining the Project in 2005 reported an average number of prescriptions of 1.4 per person per visit. However, they used different inclusion guidelines and included both hospital and clinic patients. The prior population-based Demographic and Health

surveys by Macro International did not ask about the injections prior to the project. By the 2006-2007 survey 31% of women and 18% of men reported receiving at least one medical injection in the past 12 months.

While uncertainty exists as to the of the magnitude of the rate of unnecessary injections, the MOHSS, the Essential Drug Program, FHI, URC and MSH all agreed that there was a need to reduce unnecessary injectable drug use. All agreed that injections could be reduced. Treatment guidelines were not available and were not being used, especially, staff thought, by the private sector. Nursing staff said expatriate Cuban physicians did not have Namibian guidelines available. Although appropriate use of diagnostic tests can reduce antibiotic use; screening for tuberculosis in patients admitted with pneumonia was inconsistent and sometimes delayed. During the baseline assessment several patients were diagnosed with TB only after multiple in-patient courses of antibiotics, a practice that increases injection and antibiotic use and exposes others to tuberculosis

## 4 WHAT DID THE PROJECT DO?

The project used the collaborative improvement approach for strengthening medical injection safety policies and practices in the country. The key interventions using the collaborative approach included: commodities, training, policies, behavior change communication materials, and supportive supervision to improve injection safety. URC also worked with community organizations such as Total Control of the Epidemic, NANASO, and adult and youth groups to encourage appropriate use of oral medications. Some of these groups carried the message via home visits. The former URC Chief of Party says as many as 45,000 community members were reached in this way.

### 4.1 The Project Expanded to Reach All 13 Regions and 327 Facilities.

Table 4 below shows the total number of facilities that URC staff reported as included in the project and which received commodities, posters, training, supervisory visits and policies. While only 51% submitted a report at the project's end, those missing include many of the smaller clinic health sites which have only two health care workers present. The first column reports the number who sent a quarterly assessment report, which includes most of the hospitals and larger health centers.

**Table 4: Number and proportion of facilities participating in the Injection Safety Project**

Region of Namibia 2009	# Facilities	
	Number reporting Jan-Mar 2009	Total # of project facilities 2009
Caprivi	4	27
Erongo	11	18
Hardap	17	17
Karas	9	20
Kavango	10	42
Khomas	5	15
Kunene	17	28
Omaheke	11	18
Omusati	19	53
Oshana	15	16
Ohangwena	30	33
Oshikoto	6	14
Otjozondjupa	13	26
<b>TOTAL</b>	<b>167</b>	<b>327</b>
<b>% of Facilities Reporting</b>	<b>51%</b>	

## **4.2 Conducted a Baseline National Assessment of Injection Safety**

In 2004, URC and MOHSS staff surveyed 32 hospitals from all regions using WHO's Tool C for Assessing Injection Safety. Faculty from the University of Namibia entered the data, analyzed the results and compiled the *Report on Rapid Assessment of Current Injection Practices in Namibia* (31 May – 09 July, 2004). The project relied heavily on local nurses from MOHSS which helped inform and sensitize them to issues of injection safety in different facilities. It also provided a training experience in interviewing for surveys. Information on key indicators is summarized above in Section 3.2.

## **4.3 Convened a National Injection Safety Working Group**

Using information from the baseline survey, the Project convened a National Injection Safety Working Group to develop or review national policies and to prepare a national plan. Early in the project, the group served as an oversight body for injection safety and waste management. Later, waste management incineration, were transferred to a sub-committee, and work on improving prescribing practices continued independently in the other parts of MOHSS with support of MSH. URC served as the secretariat for the Injection Safety Group.

## **4.4 Developed and Distributed Policies**

In the past five years, Namibia has developed a waste management policy awaiting final signatures, developed and printed a quality assurance policy, revised its infection control policy (currently pending final review), and per MSH, revised national treatment guidelines. PEP HIV guidelines were available at baseline and are now scheduled for review. The policy that healthcare workers should be offered hepatitis B vaccine was already in existence. The MOHSS' forward thinking policies facilitated the work of the project. URC funded printing and dissemination of policies, and related job aids and pamphlets.

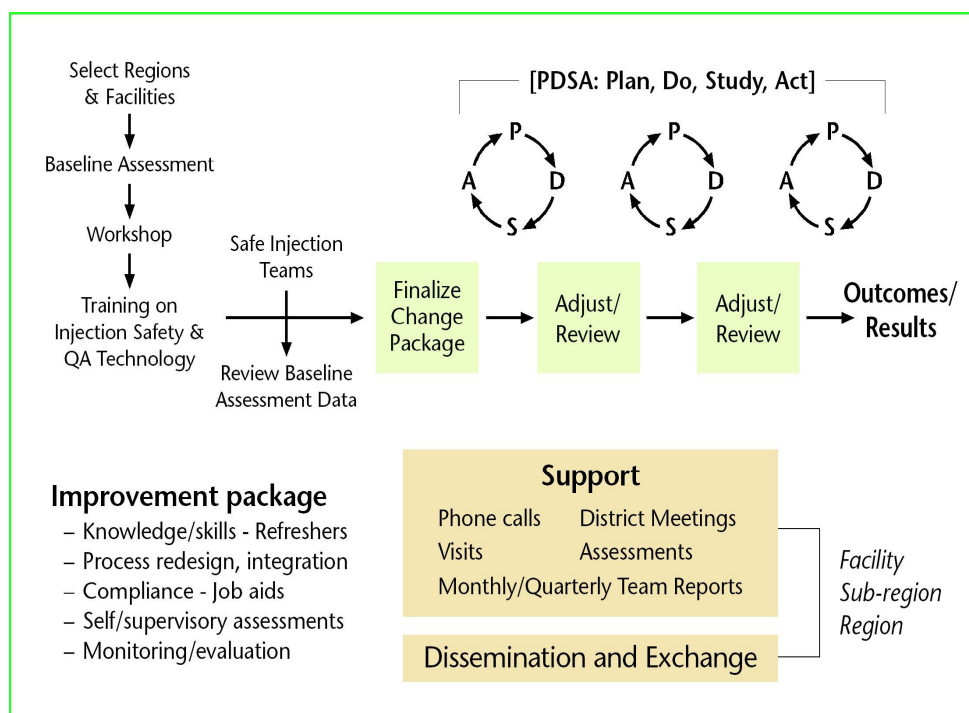
## **4.5 Developed Learning Collaboratives**

The project strategy included the development of 'collaboratives' of 25-30 facilities. The intent was to convene regional learning groups to share their successes and difficulties as measured by self and supervisor assessments. This approach used process improvement teams from different institutions. The strategy was felt to be less dependent on external technical assistance and could better utilize the local departmental resources for rapid improvement.

The collaboratives would help facilities apply quality assurance method that URC and MOHSS taught in workshops. The hope was that the collaboratives would reinforce problem solving, share knowledge and skills, add compliance with guidelines and provide feedback on performance within a community of peers.

To support this continuous quality improvement approach, URC positioned regional coordinators in different geographic areas who could provide training, conduct quarterly visits and help facilities with their self-assessments and improvement plans. Coordinators supervised up to three geographic regions and sometimes fulfilled additional roles such as Monitoring and Evaluation Officer or Acting Chief of Party. The original plan was that data submitted by the collaboratives was to be sent to a data manager in South Africa who would enter the data and submit combined reports.

**Figure 1: URC's Strategy for Quality Assurance**



### ***Status at End of Project***

While those interviewed for the evaluation gave high marks to local support and site visits, by the project's end, the learning collaboratives were not a strong component of the project. The Project focused on training persons in the PDSA method; attendees were more likely to train others than return to their facilities and apply the methodology. Collaborative meetings were not convened.

### **4.6 Provided Equipment, Supplies and Commodity Management**

The project provided the MOHSS with technical specifications for safety boxes so the MOHSS could attempt to procure them locally. URC funded the procurement of sharps containers and colored waste bin liners for five years, transferring procurement responsibility to the MOHSS at the end of the project. The initial plan had been to transfer responsibility after the end of three years, but the MOHSS requested an extensive period of two additional years and URC agreed.

The project also purchased personal protective equipment for incinerator workers, including:

- cotton coveralls
- boots
- leather gloves
- PVC sleeve protectors

- PVC aprons
- goggles
- filter respirators and cartridges

Each region was given USD\$5,000 per round to purchase these supplies. The cost per person was 664.13 Namibian dollars or USD\$84 at an exchange rate of one USD to 7.8 Namibian dollars. Workers were observed storing supplies by the incinerators or waste areas and shared supplies. Regions that joined the project early on received funds a second time to replace supplies, as shown in the table below.

As has been seen in many other countries, the waste handlers generally chose not to use the gloves, goggles and respirators. Boots, even when orders were placed for their particular size, sometimes arrived in the wrong size. The waste handlers interviewed thought the use of safety boxes and waste segregation played a more important role to protect them from exposure to infectious waste.

Meanwhile, the health care workers who need PPE to reduce exposure to blood and body fluids are the non-physicians who attend deliveries. Midwives and L+ D nurses need a way to cover bare forearms and all exposed areas including the chest. Re-usable aprons that are to be washed between deliveries are not safe or acceptable. Disposable PVC aprons do not cover the chest and arms. Regular gloves are too short.

The project also responded to the MOHSS request to fund disposable paper towels as part of efforts to improve hand hygiene. Unlike other injection safety projects, syringes were not purchased since the MOHSS already provided sufficient supply and had eliminated stock outs.

At the end of the project the central government was willing to assume the procurement and ordering for PPE for the waste handlers, but the future purchase would be the responsibility of the individual facilities.

**Table 5: Frequency of URC Purchase of Protective Clothing<sup>1</sup> for Waste Handlers by Region,**

<b>Region</b>	<b>Number of times URC purchased 2005-2009</b>
Otjozondupda	2
Kunene	2
Oshikoto	1
Karas	2
Hardap	2
Caprivi	1
Omusati	1
Oshane	1
Ohangwena	1
Omaheke	2
Khomas	0
Erongo	0
Kavango	0

At the project's end a total of 352,650 five and ten liter safety boxes had been distributed to all 13 regions. The project also provided funding for colored plastic bag liners for the segregation of trash.

To help ensure a continued supply, the safety boxes and plastic bin liners integrated into the Central Medical Supply. The MOHSS has also integrated the procurement of PPE for waste handlers into the Central Medical Supply system. The MOHSS had taken over central procurement and issued tenders for products that met specifications, which could be ordered by public facilities. Private facilities were provided safety boxes at no cost.

Another success of the project is that it gathered feedback from users about the products. Staff reported three examples.

1. During the measles campaign, needles were puncturing the safety boxes donated by Finnish donors, so a decision was made not to allow for donation of products that didn't meet specifications.
2. A trial of a new design for a locally procured safety box noted that sharps were escaping from the bottom folds, since one layer did not overlap. The situation was reviewed and new device specifications were given to the vendor. (The box was printed and glued in Namibia; the cardboard was formed and cut in India.)
3. An auto-disable syringe procured by the EPI programme (Alitom- 2 ml syringe) was distributed in boxes with no instructions for use. Staff who didn't participate in the measles campaign were unclear how to use it. Feedback about this product was given to the EPI Manager, sent to the syringe manufacturer and WHO PQS program in Geneva.

It is an important success that the system can provide post-marketing surveillance of medical devices and that issues are being reported internally, with evidence of successful resolution in several cases.

#### **4.7 Availability of Sharps Containers Decreased Needlesticks**

Staff measured success of the safety boxes by their ubiquitous presence, the tidier appearance of the facilities and the decline in needlesticks. One nurse member commented, "It shows they care about us and don't want us to get needlepricks."

Staff at every facility visited reported that safety boxes and waste segregation materials were very popular and a great success. At the project's beginning only 2% of 32 hospitals in the baseline survey had safe sharps containers, compared to 95% of the 167 reporting facilities at the project's end. In the baseline survey, 13% of the facilities had used sharps lying outside of waste containers inside facilities and 65% had sharps visible on the hospital grounds. As of the last facility report this had been improved to 6% and 3% respectively. Some facilities have also begun distribution of safety boxes to diabetic patients for home use, which was well received. As of the evaluation visit, *none of the facilities visited had sharps visible in or on the facility grounds and all had readily available sharps containers.*

The percentage of health care facilities with puncture-proof sharps containers increased from 2% at baseline to 95%, with 167 facilities reporting in January 2009. No problems with stock outages of the boxes were reported.

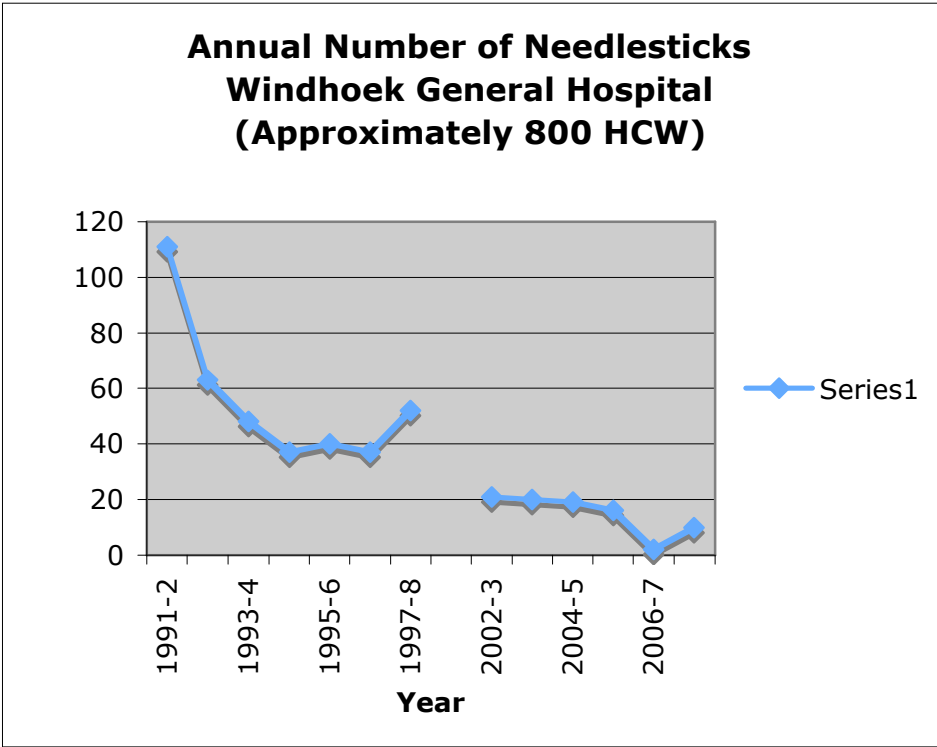
The use of sharps containers successfully removed sharps from the environment and was accompanied by a reduction in needlesticks and sharps injuries. The project instituted a quarterly anonymous needlestick reporting system to gather information necessary for injury prevention, as well as encouraged a name-based system necessary for the provision of PEP. Pamphlets, posters and training helped to overcome stigma and work to encourage reporting. During interviews for the evaluation, staff - including waste handlers - said they were more willing to report needlesticks and near misses than before the project. However, despite increased willingness to report needlesticks and use of an active anonymous active-surveillance system, all systems showed a decline in needlesticks. Some waste handlers reported they hadn't seen a used needle in the waste in years, in sharp contrast to the past. The number of sharps injury reports per facility per quarter stayed about the same even when the number of facilities in the reporting system doubled. When a person was found who reported having a needlestick in the last year, the records were checked and this injury had been reported.

### **Examples of Documented Decreases in Needlesticks**

Kakatura and Windhoek General Hospital in Windhoek had mature needlestick reporting systems that had been in place for more than a decade. The two facilities split their surveillance system at independence in 1991. Ten years ago, the facilities reported about 40-50 needlesticks per year. By 2007-8 they were reporting approximately 10 per year. (The persons responsible for reporting were unavailable so it was not possible to retrieve archived information for the years between 1998-2007.)

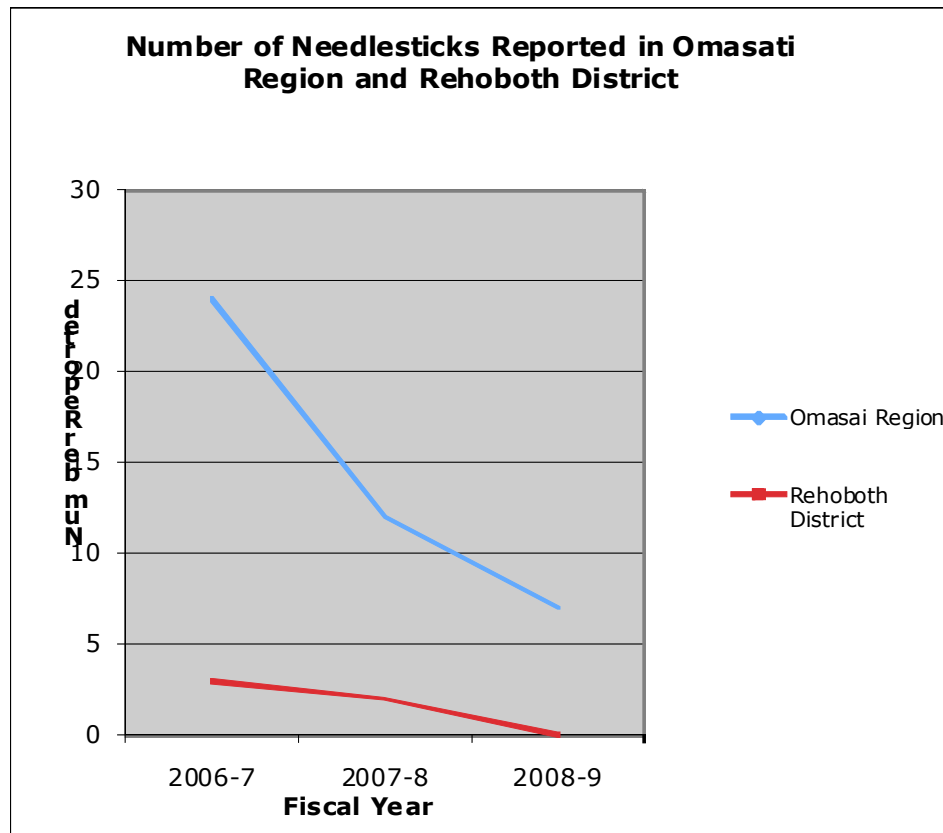
While needlesticks are often under-reported, the best information from interviews, facility reports and site visits was that many regions are having decreases in needlesticks. For example, in the years 2006-2009, needlesticks in the Omusati Region decreased from 24 per year to 7; in Rehoboth District needlesticks decreased from 3 annually to 0 in the last 18 months.

Figure 2: Annual number of needlesticks at Windhoek General Hospital



Needlestick 1991-1997 provided by FHI

**Figure 3: Number of needlestick reported in Omasati Region and Rehoboth District**



Omasati Region data provided by E.T. Kashile, Control Registered Nurse from reports for 49 health facilities (4 hospitals, 6 health centers) serving a population for 250, 226 persons.

Number of health care workers not available.

Rehoboth District has a subsidized Catholic mission hospital, 1 health center and 4 clinics serving 31, 552 persons. The number of health care workers was not available.

### ***Status at End of Project***

Staff fear that the very popular and successful supply of safety boxes will not continue after project funding ends. The MOHSS has received the last supply of safety boxes from the project but does not have a vendor who can provide a continued supply of safety boxes at an acceptable price. The MOHSS is considering recontacting vendors in South Africa to see if they can offer better pricing than with the current vendor. The current price of a safety box is approximately USD\$2.00. A stock out of boxes is probable once the current supply is gone.

The MOHSS currently has an adequate continued supply of different colored plastic waste liners in stock. Facilities that are reporting stock outs are reportedly buying local products that do not meet the thickness specifications but which are cheaper. In some facilities local authorities are limiting the number that facilities can receive to reduce costs.

#### **4.8 Supervised and Supported Safe Injection Practices**

Each facility appointed a ‘point person’ to advocate for and supervise safe injections and related practices. This was a part-time role. URC then funded a full-time regional coordinator. MOHSS supervisory staff also helped provide assistance. The on-site person conducted quarterly facility audits, taught staff, worked with infection control and quality assurance committees and reviewed prescriptions. Most of these staff were nurses, which had the advantage that they were familiar with the clinical practices of nurses and waste handling staff. However, the nurses were most effective when working with other nurses to change their practices. URC regional coordinators, who were also nurses, provided telephone support, onsite and offsite training and supportive supervisory visits. MOHSS nursing staff from the regional or national level sometimes accompanied these supervisory visits.

Facilities were also encouraged to strengthen Infection Control Committees and/or Pharmacy and Therapeutics committees and to use the PDSA approach to set measurable goals and flexible problem-solving strategies.

#### ***Status at End of Project***

Facilities reported that they had benefited from the routine supervisory visits from URC staff. During the evaluation visit, facilities were visited in four regions with several regional coordinators. Nurses throughout the facilities recognized the coordinators and point persons. Leadership could easily name the project goals and activities, and improvements that had occurred in the facility due to the project. The MOHSS also expressed appreciation for the hard work of regional coordinators who helped nursing practices conform to national standards. However, nurses realized that they had had limited impact on changing physicians’ prescribing practices.

The next phase of work reducing unnecessary injections can be supported by the work in process to strengthen Pharmacy and Therapeutics Committees by the MOHSS and MSH. Including physicians and pharmacists may be more influential at changing practices. Currently they review medication, especially antibiotic usage, but have not to date considered if an intravenous route is indicated, or worked to reduce the use of injections.

#### **4.9 Improved Availability of Post Exposure Prophylaxis for HIV**

At the end of the project, 93% of the facilities had copies of PEP guidelines available. URC reproduced and distributed copies, pamphlets, posters and flow charts summarizing the steps to take. The portion of staff who knew they should report needlesticks to their supervisor increased from 29% of 117 workers interviewed to 93% of an unknown number of staff interviewed for the facility assessments 167 facilities. The number of persons, including cleaners, who knew that PEP for HIV should be started as soon as possible and before 72 hours increased from 28% (of 117 interviewed at baseline) to 89%.

Some facilities who didn’t have a physician available reported that they now had a standing order for PEP so nurses could initiate the procedure without delay when needed. The expansion of HIV testing, counseling and treatment facilities via the work of the MOHSS and other PEPFAR partners also benefited the availability and uptake of PEP. Staff commented that they gained increasing confidence in the efficacy of HIV medication and familiarity with the testing

process and medication side effects, and were then more likely to use testing or PEP for themselves.

### ***Status at End of Project***

PEP is now widely available, with guidelines and job aids present in all the facilities visited for the evaluation. Information about PEP and reporting was known to staff including morgue workers, students, laundry workers and waste handlers.

The MOHSS Department of Occupational Health is preparing their periodic review the PEP guidelines, and is requesting technical assistance. While some one/two person facilities do not have PEP available on site, staff report excellent progress in the availability, and communication efforts around PEP and improved support to impacted staff. The MOHSS would also like to continue the workshops ‘Nuture the Caregiver’ aimed at supporting staff facing risk of HIV from occupational exposure.

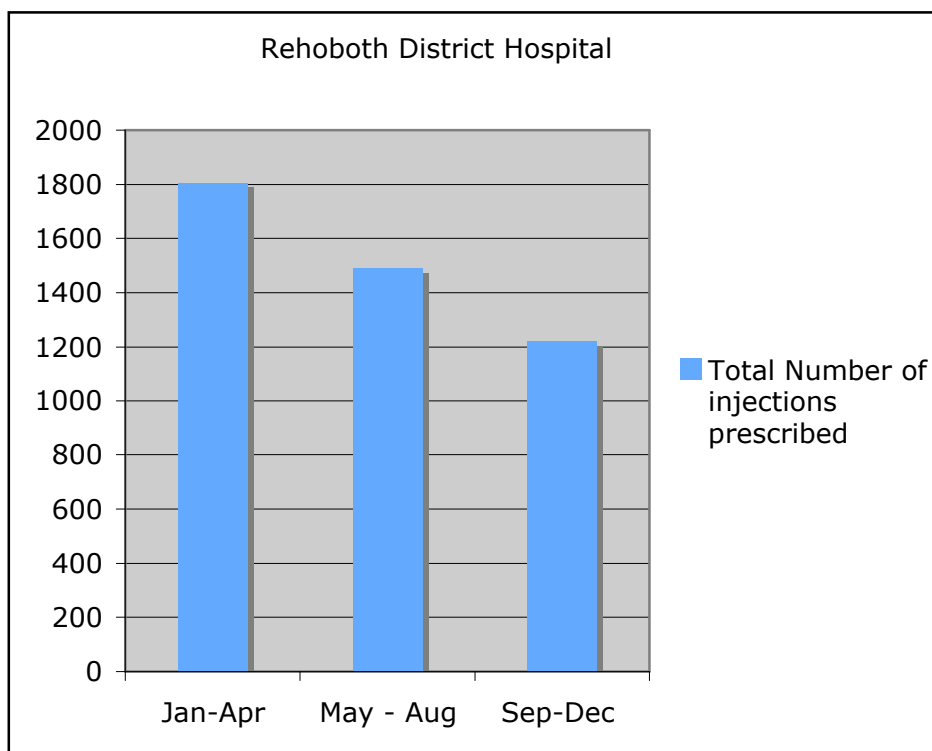
### **4.10 Improved Rational Use of Injectable Medication**

URC set out to collaborate with the existing work of MOHSS, Essential Drug Program, MSH, on rational drug use. URC staff helped review stock cards during supervisory visits to ensure that oral medications remained available. URC facility assessments gathered information about the number of injections prescribed per patient-visit; those interviewed said the project successfully reduced the number of injections, particularly prescribed by nurses. MSH supported the pharmacies to review use of medications as well.

### ***Status at End of Project***

For the first quarter of 2009, facility quarterly reports from 51% of facilities showed that the average number of injections prescribed per patient was less than 0.5 injections per patient visit. Project staff had reported that 1.42 injectable medications were prescribed per person in the early facility reports at the beginning of the project. Reporters were instructed to exclude immunizations, TB medications, and insulin for chronic diabetics and family planning injections. The definition of the indicator changed mid-project, and was not uniformly applied, which makes it more difficult to interpret. However, all available information was consistent that the use of injections had decreased. For example, the Rehoboth District reported using a consistent definition during the year of 2008. They reported decreasing the total number of injections given from 1,806 in Jan-April of 2008 to 1,493 in May-August of 2008 to 1,223 in Sept-Dec 2008. That is a 32% reduction in a one-year period. The number of patients seen in these periods was reported to be approximately the same.

**Figure 4: Reduction in Injections, Rehoboth District Hospital 2008**



During site visits for this evaluation, workers gave examples of medication practices that had changed: syphilis was treated with single penicillin shots instead of the weekly dose (primary syphilis can be treated with a single injection, secondary and latent syphilis requires longer courses). Analgesics were a large portion of injections prescribed. The use of steroids and benzodiazepines had decreased and nurses were encouraged to first use oral analgesics instead of injectable non-steroidal anti-inflammatory drugs (NSAIDs). The Expanded Programme on Immunizations (EPI) introduced pentavalent vaccine in 2009 that minimizes the number of injections per antigen.

Several control nurses and URC coordinators interviewed for this evaluation commented that the project had reduced the prescription of medication by nursing staff. In the baseline survey 65% of the nurses said that they were prescribing injections. In the past, they explained, nurses used their discretion and gave injectable medication to patients. Now if the patient required an injectable medication, they were instructed to refer the patient to the physician for assessment and a physician's prescription. Nursing staff commented that they were better able to explain to patients the efficacy of oral medication and were able to persuade patients to try oral medications first.

**Table 6:** Average number of injections prescribed per person baseline through 2009\*

Data source	2004 Baseline Survey	2005 Initial Facility Reports	1st quarter facility reports 2007	1st quarter facility reports 2008	1st quarter facility reports 2009
# of facilities reporting	32	Unknown	95	91	167
Average # of injectable meds. and IVs prescribed per person per visit <sup>2</sup>	mean 14.85	1.4	0.8	0.43	0.45
# of injectable meds. and IVs prescribed / # of records audited	Unknown	Unknown	3,780/ 4,545	1,955/ 4560	5,541/ 12,277

\*IV fluids were included, but immunizations, TB medications, family planning injections, were not.

Staff commented that the definition of medications changed midproject, but did not know how or when the change occurred

#### 4.11 Behavior Change Communication Including Training

URC coordinated training on a variety of topics: injection safety, the Plan-Do-Study-Act methodology, waste management, reducing unnecessary injections, filling out monitoring paperwork, reporting needlesticks, use of PEP, and management of medical waste and how to conduct facility assessments. Later in the project *Care for the Caregiver* training was implemented with the MOHSS to help support health care workers exposed to blood-borne pathogens. Information about reducing and managing blood exposures was provided to police staff and morgue workers. Messages about reducing unnecessary injections were also provided to prescribers, nurses and members of the general population. A train-the-trainers curriculum for injection safety was written and revised. By August of 2009, the estimated numbers of persons trained in injection safety was 8550. When training logs were checked in 2009, about 1/3 of those audited had attended prior trainings, so the number does not refer to unique individuals.

The project trained 8550 in injection safety.

The project developed and disseminated training materials, policies and posters. With MSH, an expanded Infection Control assessment tool was developed. Examples of posters on display during the evaluation visit included the following topics/titles:

- Washing hands
- Waste segregation according to color
- Preventing cross-infection

- Using alcoholic hand rub
- Responsibility of health care workers when injured on duty
- Flow chart for determining the need for HIV PEP after occupational exposure
- Steps of post-exposure prophylaxis (PEP)
- Used sharps and needles disposal without recapping
- First Do No Harm
- Nurture the Workforce.

One of the strengths of the project was URC's flexibility to address and explore topics to reduce the risk of transmission of HIV and blood-borne pathogens in healthcare facilities. When phlebotomy was identified as a risk factor for needlesticks, messages about removing phlebotomy needles with arterial forceps were developed. Information about hand hygiene was incorporated into the program. When concern about needlesticks during episiotomies emerged, recommendations to pull vaginal sutures needles with a forceps were developed. At the beginning of the project staff were using a somewhat awkward procedure to shield fingers with a speculum while suturing. At the end of the project staff in facilities visited said they were using a second tool, usually a needle holder to pull the needle. This flexibility to address newly identified safe injection problem is particularly valuable in Namibia where re-use of syringes, a core component of infection safety in other countries, was not a problem. This freed Namibia to explore new approaches to emerging problems related to safe practice such as staffing, phlebotomy, needle sticks during childbirth, and providing medical circumcisions.

Discussions with staff had indicated that they were experiencing severe stress, depression, concerns about confidentiality and loneliness after exposures to blood and body fluids. URC provided funding for a series of *Care for the Caregiver* workshops or *Nurture the Caregiver* to build team compassion and support.

#### **4.12 Instituted a Monitoring and Evaluation System**

Quarterly facility audits were conducted to assess the status of indicators shown in Tables 1-3. Facility coordinators forwarded their data to the regional URC coordinator who was to forward the data to the National URC office for compilation. In the original plan, compilation of regional and national data was to be reviewed by the National Safe Injection Working Group on a periodic basis. Among the data forms were a prescription audit, needlestick report, facility injection safety assessment and reports of the numbers trained.

#### ***Status at End of Project***

At the time of the audit, the quarterly data had not been compiled and reported for more than 18 months. Some, but not all, facilities were given a copy at the time of the survey for their local use. Some regional coordinator had decided to stop forwarding their data to the central region. Spot checks of the electronic data and the source documents from January 2008 showed inconsistencies and significant issues. *See lessons learned.*

### **4.13 Supported Waste Management**

Beyond provision of commodities discussed above, URC provided technical specifications, supplies (safety boxes, waste liners, PPE), posters, training, support for attendance at international meetings and frequent supervision. The project helped facilities to develop waste management plans. The project funding did not allow for capital funds to purchase incinerators, which was a major limitation in the destruction of waste. At the end of the project, 12/13 of the regions had interim waste management guidelines. There are only four incinerators present in Namibia. In response, USAID funded SCM to purchase incinerators in a separate project and the MOHSS approved their installation. At the time of this writing an environmental impact assessment will be conducted prior to proceeding with installation of the incinerator in central Windhoek. The USAID-funded organization Healthcare Without Harm is lobbying against the use of incinerators, which has slowed the finalization of the medical waste policy, and the installation of the incinerators. (The MOHSS has put a tender for 17 incinerators of various capacities to be installed within the next year)

### **4.14 Involve Private Providers**

Private providers were invited to attend trainings and workshops, and could submit data and receive posters, guidelines and free safety boxes. Providers who worked in the national public hospitals could also participate through their quality assurance programs. Many providers were exposed to the project's work because they also work in public facilities

## **5 WHAT CHANGED IN THE FIVE YEARS OF THE PROJECT?**

Injection safety is part of a global effort designed to rapidly implement interventions to improve injection safety. However, to be successful, globally designed projects need to be flexible enough to adapt to local priorities and changing conditions. The changes in priorities and conditions described below both influenced the success of the project and should be taken into consideration for future planning.

### **5.1 Severe staffing shortages continue at the central and facility level.**

Some facilities reported that 50 % of their nursing staff positions were unfilled. Some branches of the MOH reported they had only one person in their department despite broad portfolios. This impacts the project evaluation, since many projects aim to have the MOH assume responsibilities of project staff by the end of the funding period. However in Namibia, the over burdened MOH staff used URC staff to expand their ability to conduct training and supportive supervision visits. MOHSS and URC staff frequently worked side by side, but the severe staffing shortages preclude their ability to completely assume and sustain responsibilities.

### **5.2 Some facilities reported that 50% of their nursing staff positions were unfilled.**

Some branches of the MOH reported they had only one person in their department despite broad portfolios.

### **5.3 Access to ARVs, testing and treatment were widely reported.**

Staff said this contributed to the improved acceptance of persons with HIV, of PEP and to the decrease the stigma related to testing and treatment.

### **5.4 WHO rolled out a global hand hygiene campaign.**

The use of alcohol hand sanitizers is now visible throughout Namibian facilities. This area of increased emphasis complements work in Injection Safety.

### **5.5 Global concern mounts about airborne and droplet transmission of emerging pathogens including influenza.**

There has been increasing communication about the importance of improved ventilation, facility design, hand hygiene, social distancing, mask use and immunization. Examples of concerns receiving worldwide publicity included SARS, Corona Virus, Avian influenza, MDRTB, and H1N1 influenza. This helped strengthen interest and concern about infection control beyond injection safety, but has also shown sobering data about the difficulty of containing disease transmitted by these routes.

### **5.6 The EPI program introduced AD syringes, hepatitis B vaccine and pentavalent HIB vaccine.**

Adding hep B vaccine to the national program is the best way to protect future health workers. Vaccine to prevent Hib disease is the best way to prevent HIB disease and also help reduce the use of antibiotics. The injections safety curriculum should be updated to explain how to reconstitute vaccine using two liquid vaccines, and hep B vaccine guidelines should clarify that there is no routine recommendation for a booster after the primary series.

### **5.7 High fuel prices increased the delivered prices of imported items.**

It has been too expensive to procure some good locally. However this should be reassessed if transport costs increases. Transport costs are also a key component of the waste destruction system.

### **5.8 Malaria and sexually transmitted disease strategies have been widely implemented**

Improved treatment, prophylaxis and bednet use, which may decrease the portion of fevers attributed to malaria, reducing the need for lab tests and treatment and contribute to rational use of injections. STD treatment guidelines as well as general treatment guidelines have been revised which, if adhered to, will reduce the unnecessary use of injections and antibiotics.

### **5.9 Multiple drug resistant infections are an increasing cause of hospital-acquired infections**

Methicillin-resistant *Staph aureus*, *C. difficile*, MDRTB, drug resistant typhoid and pneumococcus etc) have become a leading cause of healthcare acquired morbidity and mortality in many parts of the world. Nurses in the northern region where a CDC funded lab was located reported that they are now seeing MRSA infections.

### **5.10 In Oshakati, the most populated region, trauma was the leading indication for admission in the referral hospital.**

These cases involve IV analgesics, antibiotics, IV fluids and invasive surgical procedures. An accident prevention program may be cost effective. Meanwhile the Regional Director would like the project to assess the infection control measures in the Operating Theaters.

### **5.11 Facilities had many new disinfectant and antiseptic products in use.**

Standard use guidelines for new products were not available, and staff were using disinfectants for antiseptics and vice versa. Some products did not have the active ingredient and concentration printed on the label, making appropriate usage impossible.

### **5.12 Internet, e-mail, cell phone and wifi connections are available in Namibia.**

The new communication technologies are increasingly available but not yet implemented in public facilities or available for regional staff.

## **6 WHAT WAS LEARNED?**

It is possible to improve injection safety when MOHSS support is clear, commodities are supplied, and supportive supervision is available from facility and regional coordinators. The project was successful at achieving its objectives. The following lessons discuss how the processes might be improved.

### **6.1 Regular communication is essential and constructive.**

The MOHSS, when interviewed by the evaluator, reported that they would like to have received regular, consolidated progress reports on the project, information on the status of the evaluation indicators, and to have the National Injection Safety Working Group convene regularly. However URC former Chief of Party commented that he had made frequent supportive supervision and training visits with Central MOHSS staff, sometimes as often as twice a month.

### **6.2 Technical expertise is required to use WHO Tool C Assessment, but even with inexperienced staff, valuable qualitative information is gained.**

In June and July of 2004, URC contracted with persons to apply the WHO Injection Safety ‘Tool C’ to assess the national state of injection safety in Namibia. One team of persons trained and supervised the interviewers, and a completely different set of persons, who did not have familiarity with the injection safety, entered the data, did the analysis and wrote the report. The strengths and weakness of this approach was one of the lessons learned. This tool did have a survey instrument and brief instructions for use, which included the recommendation to have expert guidance from a researcher or epidemiologist to oversee the assessment. It did not have sampling instructions or an analytic plan which are needed as part of a full protocol. Unfortunately, the tool was deceptively complicated for persons who had never conducted and analyzed a research survey; the survey involves several units of analysis, e.g. the facility, individual patients and health care workers.

After data was gathered, the surveys were reviewed and only 12% of the data fields were usable. But the coordinator of the study, who had never conducted a survey before, realized she needed help and handed the data over to the university faculty. But because those analyzing the study were not involved from the beginning and were told to enter all the data, resulting quantitative results were sometimes contradictory and not interpretable. However, the survey logistics themselves were well organized and coordinated.

In subsequent years, WHO incorporated feedback from users and subsequently amended instructions to provide a data entry template in Epi-Info. One lesson learned is that use of a simpler facility assessment tool at baseline from a sample of facilities would have been more intuitive, cheaper and less labor-intensive.

Fortunately, although ‘Tool C’ did not provide precise quantitative measurements of the status of injection safety indicators, it did provide valuable qualitative information about problems in injection safety. Visits to 32 hospitals allowed for identification of injection safety issues and raised the visibility of injection safety for surveyors and facility staff. Post-survey debriefs with surveyors clarified observations and provided information on the range of practices present in the country. Namibian surveyors uniformly commented that for all the failings, participation in the assessment was an excellent learning experience.

### 6.3 Lessons learned: Collaboratives require experienced facilitators and regular feedback of data to add value beyond quarterly site visits.

No collaborative meetings were scheduled at the time of the site visit and no regions reported having had a recent meeting. Minutes from past meetings were not available. At the project onset, Tina Martins, a very experienced quality assurance professional from South African URC office, provided technical assistance at these meetings to facilitate interactions and field questions. Later the collaboratives were turned over to staff new to this role. URC staff and MOHSS participants said the project trained persons in the PDSA methodology, and those persons focused on training others rather than applying the PDSA method to resolve problems.

#### One can speculate why:

- **Training with an established curriculum is easier and more well-defined than facilitating quality improvements.** The latter involves applying the method to problems which have no clear or correct answers; effective facilitation requires both interpersonal skills and extensive health care experience. Those available for employment at the regional level included dedicated, energetic but relatively young staff who were junior to persons they directed, both at the facility and in the collaboratives.
- Persons attending PDSA training received per diems, and facilitators who conducted subsequent trainings were paid US\$100 per day. Work in collaborative workshops would be less lucrative.
- Collaboratives and on-site infection control committees need to involve persons with decision making authority, so solutions can be implemented. For example, one nurse reported that when faced with repeated stock-out of red garbage bag liners, she successfully convened members of the Infection Control Committee, who then physically measured the number of bags needed by color. They then wrote a ‘motivational’ letter to petition for the appropriate number and color of bin liners. This request from the Infection Control Committee was denied. So while the group actively identified root causes for a problem, conducted observations and measurements and proposed a solution, persons who had authority to implement change were not involved in the process.
- The collaboratives did not have monitoring and evaluation data. The former COP noted that he personally compiled and interpreted the facility assessments and that he personally sent them to USAID on a quarterly basis. However, at the time of the evaluation visit, staffs had the individual facility reports, but were not able to find the quarterly compilations for the prior 18 months. Regional members of the collaboratives said that data had not been shared with them. The Injection Safety National Working Group had also not been convened for more than over a year.
- **Distance and cost of transport may have been a factor.** Namibia has one of the lowest population densities in the world. To meet with others required transport, travel time and sometimes lodging costs. Given staffing shortages and multiple project trainings, nursing supervisors reported difficulties in sending staff to meetings away from the facility.
- ‘Learning collaboratives’ are a well-known and often successful quality assurance method. Collaboratives encourage compliance with national standards yet allow for flexible methods for achieving them. In this five year project, much of the attention was focused on training in the PDSA technique. The staff used as regional coordinators were

sometimes junior to their MOHSS counterparts. Data management overwhelmed the central office. As quality assurance efforts mature, routine provision of simplified data, use of experienced senior facilitators and inclusion of persons with decision-making ability in the problem solving may strengthen the impact of the learning collaboratives

#### **6.4 Supportive supervision by facility point persons, regional coordinators and MOHSS staff was low tech, effective and appreciated.**

This was a key element of the successful program. URC staff and their role were well known to those in the facilities they visited. Despite floods, fighting with crocodiles trying to climb in windows, home invasions, burglaries and the daily stress of driving alone hundreds of thousands of kilometers across the Namib desert, staff were dedicated and consistent and health care staff expressed their appreciation for these visits.

#### **6.5 The use of self-audit facility reports was simple and effective.**

This tool helped communicate key issues, was useful despite staff turnover, and could be reviewed by regional coordinators to help resolve identified problems. Even though the audits were not compiled centrally, they were still used locally.

#### **6.6 There is a need to plan for high turn-over in facilities and in the project.**

Internally, URC staff could be encouraged to share information, plans and activities. Each staff member has skills that could benefit others in the project. For example, some times the office administrative staff had computer experience that they could have shared with the health care professions. Open discussion of roles and tasks would also help train staff new to NGO projects in the life cycle of the projects. Because staff sometimes left the project with short notice and no overlap, it was difficult for those assuming responsibilities to take over the reins. If URC staff themselves formed a learning collaborative that met periodically under the guidance of the senior management, they could compare progress and approaches, gain experience working in a collaborative and receive training to update skills. That could incubate skills in new roles.

#### **6.7 The data monitoring system was too burdensome for the staffing, and technology/skills available to the staff.**

During the evaluation visit, the quarterly facility reports had not been compiled for more than 18 months. When the electronic report was compared to the source documents for the last visit in January 2008, enough discrepancies were found that the data was not usable. It took staff about one full week to enter a quarter's data (with 51% of the facilities reporting). Staff were not using formulas in Excel spread sheets, were not able to enter data directly from the data sheets due to form design and were not using calculated fields or automated data entry checks. Some past reports had basic math errors: facility averages for number of injections per prescription were totaled, and then divided by the number of facilities, rather than adding total number of injections per prescriptions and dividing by the number of prescriptions audited. For this report, data for Jan-May 2009 was entered with two people and the spreadsheet formulas established and verified. Because of concerns about the quality of the data in the reporting system, other quarterly reports are not referenced in this report.

The project needed continued input from a person with training or experience in monitoring, evaluation and databases. However, staff were intelligent, willing to learn and motivated. Either training or oversight from an experienced person and/or implementation of a simplified system could rectify this issue. The implementation of the monitoring and evaluation system was the weakest part of the project.

### **6.8 Training should track attendees and emphasize use of knowledge gained**

Training was well organized, well coordinated and popular. More than 8,500 training opportunities were provided to the estimated 10,000 health care workers who attended formal multi-day injection safety training during the five year project.

At this phase of the project, URC and MOHSS leaders want to turn from multi-day off-site trainings to brief on-site trainings. Staff commented that infection control training consists of topics that apply to very different groups of people. Waste handlers do not need information about improving prescribing practices. Most nurses do not need detailed information about loading incinerators. Given the staffing shortage, training could be shortened and targeted to specific audiences. Not all staff need to attend the PDSA multi-day workshops. Other staff can learn by working on the improvement projects, even if they haven't attended the 'official training'.

Staff conducting the trainings reported that it was time-consuming during the training to have groups reach consensus about what problem to work on. Facilitators could address a known, common problem. For example, despite continued supply of colored bin liners at the central level, almost all facilities reported shortages. How to investigate the cause and possible solutions could be prepared in advance so facilitators would have some structure.

As URC staff are advocating, attendance at trainings needs to be tracked. In an example of the development of an appropriate system of oversight and accountability, URC central staff began to review and track attendees at PDSA workshops. While applying this system they identified a few persons who had attended the training as many as 16 times, and about a third of the participants in one region audited in 2009 had attended the multi-day training more than once. The training approval process should have MOHSS recommend staff and URC then decline permission to repeat attendees. Transition to on-site training and institutionalize pre-service training earlier in the project.

Use of in-facility training is appropriate and effective for this topic, as information can be presented and demonstrated for many of the topics in a few minutes as part of a change of shift report. Some facilities had incorporated this method. Some were also routinely including students into the training.

However, the pre-service training facilities and those preparing curricula have not incorporated injection safety and phlebotomy safety into national curricula. This should be a priority.

### **6.9 New approaches will be needed to change private providers and encourage physician adherence to national guidelines.**

In facility after facility, nursing leaders reported that private physicians worked in the public facilities but did not adhere to recommended practices. Complaints included failure to inform the facility that they were transferring a MDR-TB patient for care, failure to adhere to national

treatment guidelines, use of too many injections, failure to follow safety guidelines including smoking inside the facility. Hospital staff felt powerless and demoralized.

#### **6.10 There is a need for computer training.**

The local workforce, including URC staff, needs opportunities to become proficient with spreadsheets, databases, internet searches and technical solutions. For example, one infection control nurse, reported to be effective and experienced, was replaced by another person with computer experience but no infection control experience when the infection control position was combined with the health information system analyst.

## 7 WHAT ARE NEXT STEPS?

The recommendations for the immediate future are as follows:

- Celebrate and communicate the project's success! This project achieved its aims while relying on local staff, minimizing expensive external technical assistance and allowing local staff to learn through doing.
- Address the lack of communication: have regional coordinators submit project status reports and provide information to the MOHSS, facilities, NGO partners and the National Injection Safety Working Group. USAID can help ensure that partners share information equally. Communicate what help is needed to transition related injection safety work in other related projects and working groups.
- Convene the National Injection Safety Working Group to review the end of project data and to comment on lessons learned. Since the terms of reference have essentially been met, a decision is needed whether to dissolve, transfer waste and prescription drug oversight to another group or develop new goals for this group.
- Focus on applying the PDSA method rather than further out-of-facility training. If some training is continued, select only first time attendees.
- Institute supervision over the regional coordinators.
- Work with the MOHSS to revise and communicate guidance about the use of Hep B for health care workers. Most facilities are testing individuals prior to offering vaccine and mistakenly believe that there is a need for a booster after 5 years. There is also confusion about the use of hep B vaccine at hire versus post-exposure. When the guidelines are available, help advocate for increased immunization coverage for healthcare workers.
- Transition with MSH and MOHSS on reducing unnecessary injections. There are dual reporting systems and indicators tracking prescription and injections that should be reviewed and possibly harmonized or combined. MSH's suggestion to have Pharmacy and Therapeutic Committees assume responsibility for appropriate use of injectable drugs and antibiotics may help change physician prescription practice.
- Work with MOHSS to develop an agreement for private providers that in return for the privilege to practice in public facilities they agree to use the national treatment guidelines and abide by the indications for parenteral medications. Providers' prescribing patterns can be audited prior to renewal of privileges.
- Private providers should purchase safety boxes rather than deplete the stock of public facilities. The project goal was to give boxes for 6 months and then have facilities buy their own stock.
- Recontact training institutions, university and curriculum developers as part of PEPFAR to encourage them to incorporate injection safety into standard pre-service training for the appropriate procedures.
- Given the doubled cost of disposable safety boxes (more than USD\$2 per person) explore more cost-effective options, including perhaps automated systems (e.g.: Steris in the U.S.) that use a hands-free method to empty and dump reusable safety boxes at the

incinerator. They then reprocess the plastic boxes and re-use them. Work with the MOHSS so an option is available for facilities when the current supply runs out.

- Provide a technical review of the new Infection Control Guidelines, in particular the use of disinfectants and antiseptics. For example, the draft guidelines recommend the use of sodium hypochlorite solution to reprocess fiber-optic scopes, which would be both ineffective and damaging to expensive equipment. (See Multi-Society Guidelines for the Reprocessing of Fiber-Optic Endoscopes: ([http://www.shea-online.org/Assets/files/position\\_papers/SHEA\\_endoscopes.pdf](http://www.shea-online.org/Assets/files/position_papers/SHEA_endoscopes.pdf))).
- Work with MOHSS to ensure that when safety standards are set for products, decentralized decision-making does not result in use of substandard products procured locally.
- With EPI, update the injection safety curriculum to explain how to reconstitute vaccine using two liquid vaccines and how to use available models of AD syringes.
- Continue to share at least written information with phlebotomists, including members of the Institute of Pathology.

## 8 WHAT IS THE NEXT HORIZON?

MOHSS and facilities would encourage URC to seek additional funding and to continue to work in Namibia. When the nature of the work was left open to respondents, the most common request heard from all levels was for help to prevent the nosocomial spread of tuberculosis. Health care management and staff cited their concern about the increasing risk of drug-resistant TB to health care workers and patients. While this is a specific need, there is a general need to improve infection control practices related to diseases transmitted by respiratory (airborne and/or droplet) routes.

There is emerging recognition that healthcare workers are at elevated risk for contracting tuberculosis, and multiple drug-resistant tuberculosis (MDRTB). They are likely to face far greater risks of TB disease than the general population. WHO compiled new information on the acquisition of TB by healthcare workers (WHO TB Policy on Infection Control in Healthcare Facilities, Congregate Settings and Households. WHO/HTM/TB/2009.419. World Health Organization, Geneva, 2009). They cited 30 studies in which the risk of TB disease in health care workers was more than 5 times that of the general population.

Namibia has one of the highest rates of TB disease in the world, with current rates of disease at 780/100,000 persons. Two factors make TB much more dangerous for workers in Namibia. First, patients abandon treatment at high rates, which fosters development of drug-resistant and sometimes untreatable TB. Second, an estimated 15% of the general population may be HIV+, which increases both the progression to disease and the risk of death from TB. Workers are concerned that there is relatively little that individuals can do to protect themselves from exposure: protecting workers from TB depends much more on facility design and ventilation systems and the effectiveness of systems to screen and isolate patients.

Protecting patients and workers from TB is an ethical action and a practical imperative for understaffed healthcare systems. For a system that is already facing severe staffing shortages and which has well-trained staff, staff fearful of TB disease could seek lucrative employment in Europe and the U.S. In the five years since the project began, healthcare workers' fear of occupational acquisition of HIV has been replaced by fear of MDR-TB. It will be important to address this concern.

Regarding what future work in injection safety would be appropriate, it is the opinion of the evaluator that work could expand to topics including:

- safe and appropriate use of IV medication, with a goal of reducing unnecessary use of IV, and IV push medications, and improved insertion and management of IV lines,
- continued work to reduce needlesticks and blood exposures related to phlebotomy and episiotomies
- continued work around appropriate use of antimicrobial medications
- appropriate use of pre-operative antibiotics,

Other work requested was continued but broadened work in infection control. There is a need for guidance on reprocessing: cleaning, sterilization and disinfection of devices and surfaces. Help in instrument reprocessing and infection control for operating theaters was also requested. Safe implementation of circumcision would also be of benefit.

Given that maternal and child mortality remains a global concern, and that perinatal services are a microcosm of many potential risks for HIV transmission in health care facilities (e.g. breast feeding, suturing, blood transfusions, capillary testing, potential for large blood exposure to staff, need for specialized PPE, need for both disinfection and sterilization of equipment, provision of immunizations, circumcision and episiotomy techniques) future monitoring of practices to minimize transmission of HIV in healthcare settings could select perinatal service areas to audit to ensure continued attention to this oft neglected and very important portion of the health care facility.

## 9 APPENDIX - FACILITIES VISITED AND STAFF INTERVIEWED

MOHSS

Mr. RCM Platt,

Deputy Director, Logistics

[rplatt@mhss.gov.na](mailto:rplatt@mhss.gov.na)

Dr. Ali El Sherif

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Mrs. Platt

Senior Health Program Administrator

National TB Control Program

Mrs. Gordon, Chief Nursing Officer

Quality Assurance

EPI Program Staff

Ms. Tina Alice

Partners

MSH

Dr. Devid Mabrizri Senior Technical Advisor,

[dmabrizi@msh.org.na](mailto:dmabrizi@msh.org.na)

World Health Organization

Rosalina Dalee, Surveillance Officer

Regional Office and Health Facility Visits

Windhoek Central Hospital

Control Nurse and staff including waste handlers

Kakatura Hospital

Control Nurse and staff including waste handlers

Oshakati State Hospital

Control Registered nurse Natalia Tulimuwo Mungoba and staff including nursing matron, facilitator for PDSA workshops, District Primary HC Coordinator, students.

Oshana Regional Director Dr. Hamatu

Omusati Regional Director, Senior Health Program Administrator, Coordinator for Special Programs, 2 Control Nurses, nurse practitioner

Infection Control Coordinator Haufiku, and E. T. Kashile

Omusati Health Centre

Nurse Matron and staff

Outapi District Office

Nurse Manager and staff including waste handlers

Outapi Hospital

Control Nurse and staff including waste handlers

Outapti Clinic and Staff

Hahenene Health Center

In-Charge and staff including waste handlers

Rehoboth Health Center

Acting Control Nurse and staff

St. Mary's Hospital

Rehoboth District Acting Control Nurse and staff

URC Project Office in Windhoek

Staff based in Windhoek, Keetmanshoop, Oshakapti, and Oshikoto,