

Assessment Of Injection Safety Practices In Health Facilities In Bongo And Talensi Districts In The Upper East Region Of Ghana: Part 2–Waste Disposal System

Reuben K. Esena, Abdul Aziz, Winfred Dotse-Gborgbortsi

Abstract: Injections safety practices are crucial to Quality of Care and it is important to assess their use and disposal systems. In this study, a cross-sectional design was adopted in two districts - Bongo and Talensi. Personnel [giving injections in the prevention and curative sections] and the heads of the facilities were observed and interviewed. The waste disposal systems and disposal sites of the facilities were also assessed. A total of thirty-one (31) staff were observed and interviewed in 8 health facilities. In all twenty-one (21) were observed and interviewed in Bongo and ten (10) in Talensi districts. Twenty-two (78.6%) prepared injections on clean tables and trays. Fourteen (50%) respondents reused mixing syringes for reconstitution and 4(17.9%). Eight (17.9%) had shortage of cotton wool. Community Health Nurses who experienced shortage of cotton wool used syringe wrappers in place of cotton wool after injection. Two hand recapping was observed in 3 (10.7%) respondents. Two (25%) facilities had sharps scattered at the disposal site. The two facilities that have incinerators were not using them at the time of the visit. The challenges to injection practice were the use of improvised items, reuse of syringes for reconstitution, shortage of logistics and supplies, unattended, open and unrestricted disposal sites leading to sharps scattered around disposal site and non-use of incinerators. It has been recommended that the Regional EPI coordinator must conduct quarterly assessments on availability of EPI logistics and supplies in the districts and facilities.

Index Terms: Auto Disposable Syringe, Antenatal Clinic, Child welfare Clinic, Safety Boxes, District Health Management Team, Community Health Nurse, Outpatient Department, Puncture-proof Container.

1 INTRODUCTION

INJECTIONS are one of the most common health care procedures, with some 20 billion injections administered worldwide each year. Most injections [95%] are given for therapeutic purposes, and only 5 to 10% are given for immunization [WHO, 2003]. Injections are often unnecessary and are frequently unsafe. Unsafe injections are responsible for millions of cases of Hepatitis B and C, and an estimated one-quarter of a million cases of HIV annually. Re-use of injection equipment without sterilization is frequently a key problem.

Injection safety

A safe injection is one that does not harm the recipient, does not expose the health care worker to any avoidable risks and does not result in any waste that is dangerous to the people [WHO, 2010].

Injection safety policy for Ghana

“The Ghana health service pursues the policy of 100% safe injections given in the public and private sectors for any purpose. This means that every injection must be given using a single sterile syringe and needle combination which is then safely disposed of after use.” (GHS, 2003)

Diseases that unsafe injections and injection waste disposal can cause include:

Hepatitis B virus – Hepatitis B (HBV) is well-known as a highly infectious disease. Unsafe injections account for about one-third of new HBV infections in developing countries, equal to an estimated total of nearly 21 million people infected each year.

Hepatitis C virus - Unsafe injections are the most common cause of Hepatitis C (HCV) infection in the developing world, causing two million new infections each year, over 40% of HCV cases. In some countries (e.g., Egypt and Pakistan), evidence suggests that HCV has reached high levels due to unsafe injection practices.

HIV/AIDS – The World Health Organization (WHO) estimates that unsafe injections cause an estimated 250,000 new HIV infections each year, about 5% of all new HIV infections. Research indicates that most of the HIV infections that are caused by unsafe injections occur in South Asia and Africa. Most vaccines currently available are given by injection and global concern about unsafe injections has compelled immunization managers and providers to address safety issues more seriously than ever (Hauri et al, 2003).

Some injection practice problems in health facilities

Among others some other injection problems in health facilities include; use of unsterile injection equipment, Unsafe collection of Sharps, Unsafe management of waste, Unsafe injection

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practices,

Injection equipment

Injection equipment that can be used to administer injectable vaccines and other medicines include: auto-disable syringes, standard disposable syringes, pre-filled and single dose non-reusable devices.

Safe Injection Policies

Governments have the primary responsibility for ensuring that injections are safe. At a minimum, policies are needed to address the following key issues; Reduction of the total number of unnecessary injections, Promotion of safe injection practices, Provision of sufficient quantities of appropriate injection equipment and infection control supplies and Management of sharp waste Against the above comes with a budget that must meet Needles and syringes, Safety boxes, Training, Incinerator equipment and spare parts, Fuel for incinerators, Sterilizing equipment, spare parts and fuel in places where sterilizable injection equipment continues to be used (Immunization Essentials, 2003)

Injection Safety Assessment

Among other things, injection safety assessment includes; Competence of the staff on injection practice, the availability of injection equipment, logistics and supplies, Injection waste disposal system of the facilities, the availability of injection safety and waste disposal plans and systems.

Standards for achieving adequate injection safety measures in Ghana.

The highest standard of injection safety is achieved with a single use disposal syringe and needle (ideally an auto disposable type) which is, sterile prior to being packaged and sealed by the syringe manufacturer and opened immediately prior to injection, used to give one injection to an individual using the correct medication or vaccine, disposed of without being recapped in a designated safety box or sharps puncture-proof container after the injection is completed. When full, the safety box is burned (without content being emptied or unped) either in a dug pit or incinerator, and the burned waste buried (GHS EPI injection safety Document 2002-2003) Ghana Health Care waste management policy prescribes the Storage and prevention of spillage or loss, Segregation, Label waste to identify source, Engagement of authorized persons in passing and receiving waste and Description of waste, (Institutional Care Division, GHS, 2003)

The W.H.O strategy

The W.H.O strategy for achieving safe and appropriate use of injections worldwide have four objectives; they include:

- (1) Formulating national policies and plans for the safe and appropriate use of injections,
- (2) Ensuring quality and safety of injection equipment,
- (3) Facilitating equitable access to injection equipment and
- (4) Achieving appropriate, rational and cost effective use of injections.

Management of sharps waste

As the use of A-D syringes increased so it is crucial to dispose of injection supplies properly. Used syringes and other

injection waste are not to be dumped in open places where people might, step on them or come in contact with them in any other way. Sharps disposal could take the form of disposing the whole syringe with needle attached – here the whole syringe with needle attached is dropped in a safety box for onward incineration; Separation of needles from plastic syringes – here the needles are removed from the syringe with a simple device with a receptacle that receives the needles. The needles are either encapsulated and buried in a protected burial in an onsite pit or disposed off in a sharp pit. The syringes are either shredded before burial in an onsite pit or they are treated with 0.5% chlorine solution for 30 minutes or boiled for 20 minutes and then offsite disposal or recycled. The need to better manage contaminated sharps has prompted the development of tools to assist countries with planning and policy development. These include: an assessment tool for health care waste management that examines current practices, level of awareness of risks and country regulatory framework in order to provide essential information for designing an action plan.

Safety Boxes

Safety boxes or sharp containers are puncture-resistant containers into which A-D syringes and needles are placed immediately after use temporarily stored until they can be destroyed. They should be supplied in sufficient quantity such that they are always within reach of a vaccinator, even during outreach sessions.

Volume of safety boxes

Approximately 100 2ml syringes and needles fill a five liter safety box. 5ml and 10 ml syringes take up more space.

Waste disposal and destruction

Filled Safety boxes are supposed to be incinerated. If an incinerator is not available, a much less desirable but effective alternative is to use kerosene to burn them. In planning waste disposal in a health facility, managers should consult medical waste policies and environmental regulations for the national and local levels. The plans must include; Location of disposal facilities, Disposal of filled safety boxes, Schedule and budget for destruction of safety boxes, Logistics, Training, Incineration equipment WHO, **2003**).

Results of injection safety Assessment conducted in five countries

- **Methods and tools used in conducting assessments**

All the studies conducted on injection safety assessment used the WHO/SIGN Tool kit and the studies were all cross-sectional observational studies.

1.2 Conceptual framework

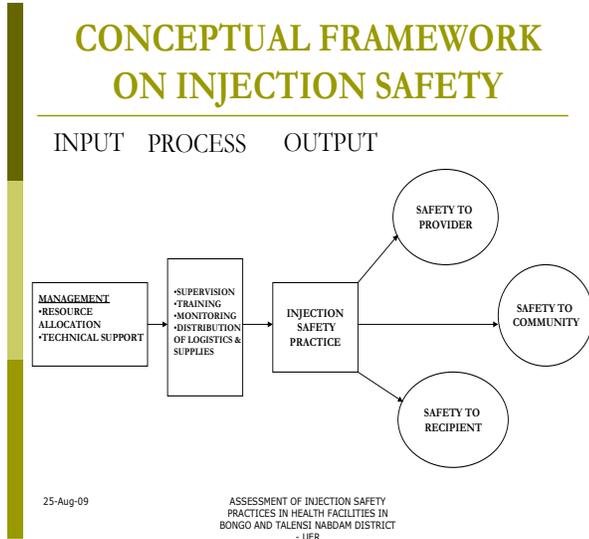


Figure 1: Conceptual Framework

The implementation of injection safety policy in every health facility is focused on the provision of quality and safe injections and safe disposal of the injection wastes [Figure 1]. The observance good injection safety practice guarantees safety and avoids risks to the provider, the recipient or client and the community. Risk to the recipient of an injection can occur through reuse of inadequately sterile syringes or needles, contamination of equipment or improper reconstitution/preparation during injection preparation, or exposure to used sharps within health care settings. Also in health care settings, injection providers and waste management personnel are the occupational categories with the highest risk for accidents with used sharps. For injection providers this risk can occur during the action of injection provision or later if used sharps are not adequately disposed of leading to needle sticks injuries. The community can be exposed to risk when used sharps are not disposed properly in the environment where waste pickers and other people can be pricked and infected. A good injection practice in health facilities is a reflection of adequate resource allocation, adequate supportive supervision and good technical support.

What can be done to promote safe and appropriate use of injections?

National governments, WHO, and others working with the Safe Injection Global Network (SIGN) continue to collect compelling evidence of infections associated with medical injections, and actively work to promote safe injection practices and policies. Introducing an injection safety component at the design phase of relevant projects is a useful way to initiate a national safe injection plan in a systematic way.

2.2 The Study Area

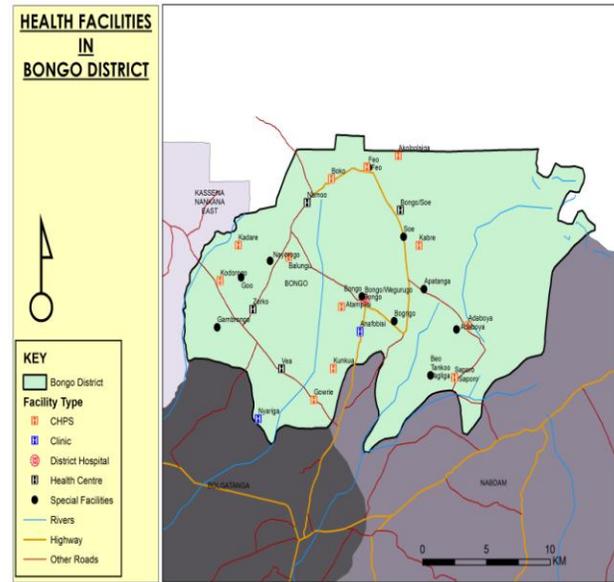


Figure 2: Map of Bongo District in the Upper East Region of Ghana

Bongo District profile

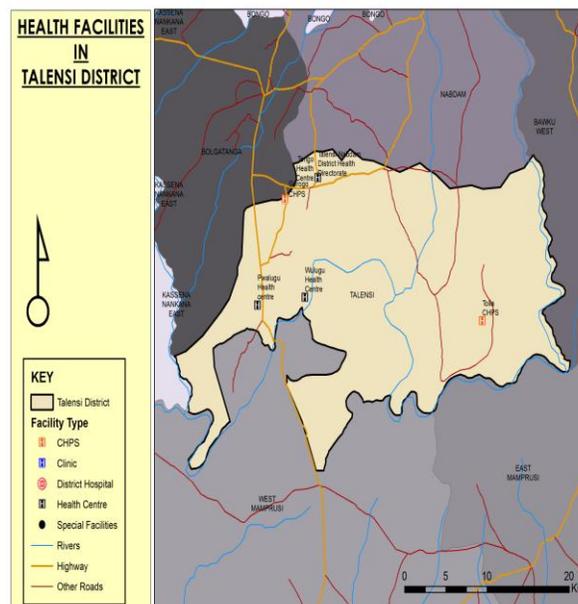
Bongo District [Figure 2] is one of the 9 districts in the Upper East region with Bongo as the capital. It lies between longitude 0.45° W and latitudes 10.50° N to 0.09° N within the onchocerciasis zone. It has a land area of 459.5 square kilometers and is one of the most densely populated districts in the country with 185 inhabitants per square kilometre. The district was carved out of Bolgatanga district in 1998 and shares boundaries with Burkina Faso to the North and East, Kassena Nankana district to the west and Bolga district to the south. There are 132 communities in dispersed settlements. The land terrain is mostly rocky. The district is divided into 6 sub-district health area with a total population of 85,009. Below is the break down of the population by sub districts

Table 2: Subdistricts, population, and some vital indices, Bongo

No	Sub-district	Total pop.(2008)	WIFA	exp. pregnancy	CHN 0-11 mths
1	Central	19,900	4776	796	796
2	Bongo Soe	12,881	3091	515	515
3	Valley Zone	10,252	2460	410	410
4	Bongo Beo	15,093	3622	604	604
5	Zorko	16,220	3893	649	649
6	Namoo	10,663	2559	427	427
Tot al		85,009	20402	3401	3401

Table 3: District Service data, Bongo

	2008	2007	2006
OPD attendance malaria	28,197 - 48.5%	20,027 - 34.5%	
Malaria admissions	2045 - 53.6%	1300 - 43.5%	
Under 5 OPD attendance	16,720	9,402	
Under 5 OPD attendance (Malaria)	9,361 (56%)	6,603 (70.2%)	
Under five admissions	1,154	703	
Under five admissions due to Malaria	972 (84.2%)	547 (77.8%)	
Tetanus vaccination for pregnant women (TT2+)	2774 (79%)	4328 (128.7%)	4221 (85.2%)
Family (injectables)			
Norigynon	(actual)45.6	2.5	28.5
Depo provera	(actual)1854.3	1695.2	1093.3
CWC vaccinations			
BCG	3,482 (102%)		
PENTA 3	3,137 (92.2%)		
Measles	3,240 (95.3%)		
Yellow Fever	3,024 (89%)		

**Figure 3: Map of Talensi District in the Upper East Region of Ghana****Talensi Nabdam District Profile**

Talensi [Nabdam] district [Figure 3] is a newly created district which was carved from Bolgatanga Municipality in 2004. It covers an area of 918 sq km and is bordered on the North by Bolgatanga, south by West and East Mamprusi districts in the Northern region, Kassena Nankana on the west and Bawku west on the East. The occupation of the people is mainly peasant farming; but small scale mining and petty trading. The 2008 projected population was 97,672 living in 105 communities. The topography of the district is dominated by relatively undulation of lowlands and gentle slopes ranging from 1% to 5% gradient with some isolated rocks, hills and upland slopes at Tongo and Nangodi. They fall within the Birimian, Tarwaian and Voltarian rocks of Ghana. The district is drained by the red and white volta and their tributaries.

Table 4: Health Facilities, their locations and their status, Bongo

SUB-DISTRICT	H/Centre	RCH centre	CHPS compound	District Hospital
Central	0	1	3	1
Bongo Soe	1	0	3	0
Vea - Valley Zone	1	0	2	0
Bongo Beo	0	1	2	0
Zorko	1	0	2	0
Namoo	1	0	1	0
Total	4	2	13	1

Target populations

- WIFA 241019
- 0-11 - 40170
- 0-59 - 2008490
- Exp. Preg 40170

Health Infrastructure

- Sub districts 6
- Health facilities 17
- Health centres 3
- Clinics 5
- Proposed CHPS compounds 18
- Functional CHPS compounds 9
- Outreach clinics 6
- Nutrition Rehabilitation centre 1

Table 5: District indicators, Talensi

	2008	2007	2006
OPD attendance malaria	34,955	22,787	
Tetanus vaccination for pregnant women (TT2+)	3468	4151	3490
CWC vaccinations			
BCG	3958	4811	4479
PENTA 3	4049	4624	4077
Measles	3731	4383	3996
Yellow Fever	3725	4309	3943

2.3 Problem Statement

In the last National Injection safety assessment carried out in 2003 only 14% of facilities across the country had wet swabs for skin preparation; 8.8 % had no sharps boxes in stock; there were two hand recapping in 8.7% and 16.67% among immunization and curative staff respectively. Only 11.2% of the facilities had safety boxes at the area where injections were given. Furthermore, 3.0% of the facilities had presence of overflowing, pierced or opened boxes and 10% of them had evidence of Health Care Waste (HCW) scattered around the health centres and or disposal site. The report further stated that Low temperature burning remains most frequent method of waste treatment and inappropriate treatment or disposal of sharps imposing threats to the community also existed (Antwi-Agyei et al, 2003 - unpublished). In Bongo and Talensi districts, facilities with incinerators are not using them to dispose of sharps whiles some other health facilities do not have a well managed disposal sites with evidence of partially burnt injection wastes and sharps around the sites. There has been increased Out Patients (OPD) attendants and admissions which poses a challenge to the facilities in maintaining good injection safety measures and waste disposal. For instance, Malaria OPD attendance and admissions in health facilities in Bongo district increased from 20,027 (34.7% of all OPD attendance) and admissions from 1,300 (43.5% of all admissions) to 28,197 (48.5% of all OPD attendance) and 2,045 (53.6%) in 2012. Talensi Nabdum district recorded OPD attendance increased from 22,787 in 2011 to 34,955 in 2012. Increased injections posed risk of needle sticks injuries and also managerial challenge in the provision of adequate resources, supervision, training and management of injection wastes.

2.4 Research Question

To what extent is injection safety practice influenced by management system of planning, resource allocation, technical support and supportive supervision?

2.5 Justification

There is therefore the need to update the records on injection safety practices in the health care institutions in the district through periodic assessment. Findings from this study will be

used to inform policy formulation and implementation for strengthening the capacity of facilities in ensuring good injection safety practice.

2.6 General Objective

The general objective of this study is to assess the injection safety practice and management system that promotes injection safety in health facilities in Bongo and Talensi districts in the Upper East region

2.7 Specific Objectives

The specific objectives of this study are to:

1. assess the waste disposal system in the facilities
2. describe management system that promotes injection safety practice: planning, resource allocation, technical support and supervision.

3.0 METHODS

3.1 Study Design:

A cross sectional design was used for this study adopting a mixed-study paradigm [qualitative and quantitative].

3.2 Study location

The study locations were Bongo [Figure 2] and Talensi [Figure 3] Districts, Upper East region of Ghana.

3.3 Sampling and Sample size

A convenient sampling was used to select the facility, two staff from preventive section, two from the curative section and the heads of the facilities were interviewed purposively. The study included the observation of injection processes and the immediate environment where injections are given, observation of waste disposal systems of the health facilities, observation of equipments, logistics and supplies and also interviewed injection providers and supervisors on the planning, resource allocation, technical support and supervision.

Facilities:

All health facilities and hospitals with full compliment of services were included in the study. Seven health centres and one hospital were finally selected in the two districts.

Outreach sites:

Since the maternal and child units conduct immunizations both on outreach and static basis, observations and provider interviews were extended to these places as the situation demanded.

Observations:

In each facility observations were made at the injection rooms of the out patients departments, the wards, maternal and child health unit, the stores and the waste disposal sites.

Interviews:

1. In the hospital, the Medical Superintendent, the administrator or the matron were purposively be interviewed.
2. Also, a total of four staff, two from the maternal and child health unit and two from the wards/injection room.

3.4 Variables of Study:

Dependent variable: Injection Safety practices

Independent variables were:

1. Background characteristics of respondents
2. Characteristics of facilities
3. competence in injection safety practice
4. Availability of logistics and supplies
5. Availability of waste disposal facilities and system
6. existence of management system systems

3.5 Data collection tools and technique

The standardized WHO/SIGN tool (Tool C) for assessing injection practice was adapted and used to collect data. The tool was used to conduct structured observations and provider interviews:

3.6 Data processing

Data processing was done using EPIinfo version 3.4.1(July 2007). Check codes were used to avoid double entries. Pre-testing of the tools was done to eliminate inconsistencies and made the questions relate to the local settings. Data cleaning was done to account for missing values in a bid to ensure integrity and reliability.

3.7 Data Analysis

Frequencies cross tabulations and graphs were used to do the data analysis;

3.8 Results frame work

The final results are presented as follows:

1. Health care facilities included in the sample [[Characteristics of the facilities]
2. Background of staff observed and interviewed
3. Risk to the health care provider
4. Risk to the patient
5. Risk to the community
6. Management issues

3.9 Limitations

1. Observation of practice may be biased through observer-induced changes in practice
2. Information was not readily available on the costs [amount of funds that are spent annually] of injection safety practice and waste disposal
3. However all these limitations did not affect the quality of the research findings.

3.10 Ethical considerations

1. Approval was sought from the Ethical review board/GHS.
2. Letter requesting for permission from RHMT/DHMT/Health facilities for the study
3. Consent forms were administered to respondents before interviews and observation
4. The confidentiality of the responses from the respondents was assured by explaining how the information shall be recorded and used.
5. The researchers exercised discretion by intervening to prevent potential harm to recipient in the event of an attempt to conduct an unsafe injection practice and also provided technical advice for instant correction.

Eg. Re-use of syringes and/or use of injection equipment without sterilization.

6. The researcher where necessary provided to facilities technical support on injection safety policy and improvement of waste disposal system.
7. Immediate feedbacks were provided to management of facilities and the Health administrations on findings.

4.0 RESULTS

4.1 AVAILABILITY OF INJECTION LOGISTICS AND SUPPLIES

4.1.1 Information on logistics and supplies reflecting risk to the recipient by facility

Out of the 28 respondents, 3(10.6%) had swabs for skin preparations either, dirty, stained or bloody [Figure 4]. About 26(92.9%) of them had only one week supply of disposable or AD syringes. Five (17.9%) had occasional mismatch between vaccines/injectables and AD/disposable syringes and also had shortage of injection logistics (cotton wool and mixing syringes) [Figure 4].

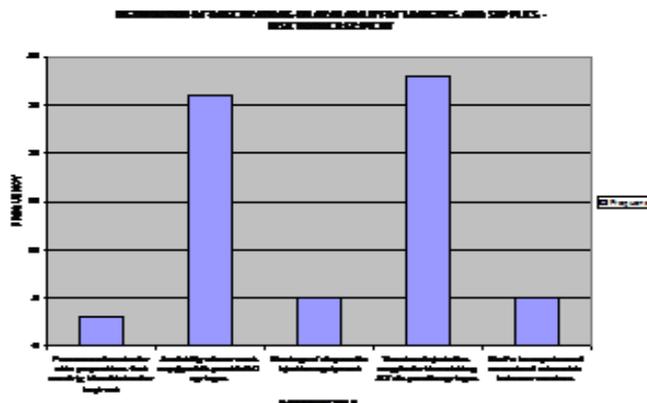


Figure 4: Availability of logistics and supplies reflecting risk to the recipient

Injection section with swabs for skin preparations that are dirty, blood stained or wet

Information on the type of injection section with swabs for skin preparations for Bongo District is presented in Table 6. It was noted that all 3 (10.6%) of respondents who had presence of swabs for skin preparations that are dirty, blood stained or kept wet are from the curative section.

Table 6: Information on type of injection session that have swabs for skin preparations that are dirty, bloodstained or kept wet

TYPE OF INJECTION SESSION					
Presence of swabs for skin preparations that are dirty, bloodstained or kept wet	District	Curative	Outreach	Vaccination (static)	Total
Swabs are dirty, bloodstained or wet	Bong Talen	3 10.8	0 0.0	0 0.0	3 10.8
Swabs not dirty or wet	Bong Talen	11 44.0	6 24.0	8 32.0	25 89.3
TOTAL	Bong Talen	14 50.0	6 21.4	8 28.6	28 100.0

4.3.2 Logistics and supplies reflecting risk to the recipient by district

Out of the 19 respondents in Bongo and 9 in Talensi Nabdam districts 2(10.5%) and 1(11.1%) had presence of swabs for skin preparation that are dirty, bloodstained or kept wet respectively. Nineteen (100%) in Bongo and 7(77.8%) in Talensi Nabdam had one week supply of disposable/AD syringes. Four (21.1%) in Bongo and 1(11.1%) in Talensi Nabdam had shortage of disposable injection equipment. Nineteen (100%) in Bongo and 9(100%) in Talensi Nabdam had vaccines/injectables supplied with matching AD/disposable syringes. Two (9.5%) in Bongo and 3(30%) in Talensi Nabdam experienced occasional mismatch between vaccines/injectables and AD/disposables syringe [Figure 5].

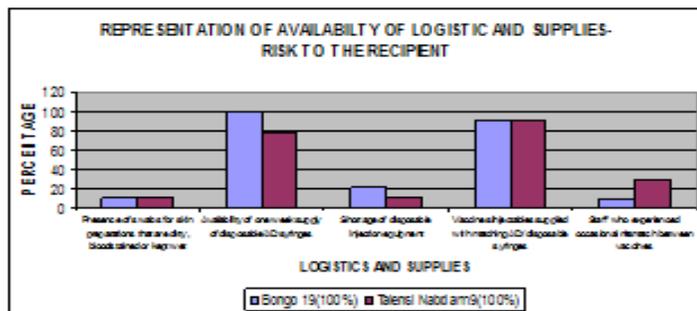


Figure 5: Availability of logistics and supplies by district

4.3.3 Information elements on logistics and supplies reflecting risk to the provider by facilities.

It was evident that even though there was no acute shortage of SBs in any of the facilities, there were inadequate supplies in some of the facilities. Seven (25%) of the respondents confirmed that they had less than 10 SBs at the time of the visit. Needle sticks injuries do occur among the providers even though not frequently. Nine (32.1%) of respondents had one or

more needle stick injuries. There were shortages of cotton wool in some facilities as confirmed by 5(17.9%) of the respondents. Certain crude innovations occur during shortages of cotton wool. Four (80%) of the respondents who had shortages said they used syringe wrappers in place of cotton wool after injections. A significant number 5(17.9%) of the respondents said there were shortages of syringes and needles for reconstitution in the past three months [Figure 6].

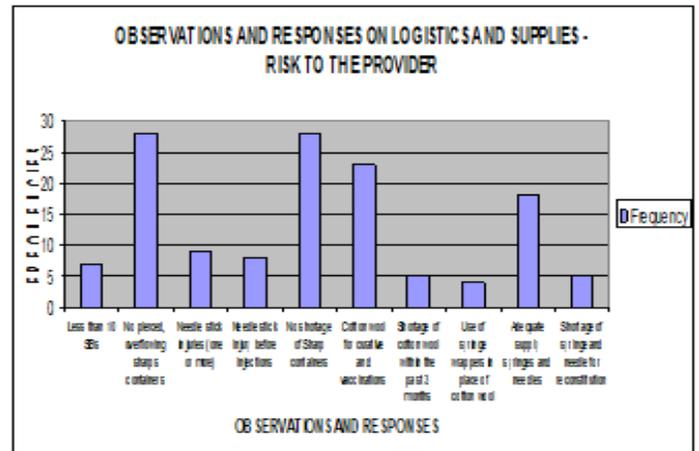


Figure 6: Observations on responses on logistics and supplies reflecting risk to the provider

Table 7 Compares injection sessions between Bongo and Talensi districts.

Table 18: Type of injection session responding to shortage availability of cotton wool

TYPE OF INJECTION SESSION					
Shortage of cotton Wool within the past 3 months N= 28	Districts	Curative	Outreach	Vaccination (static)	TOTAL
Shortage of cotton wool	Bongo Talensi	1 3.6	2 7.1	2 7.1	5 17.9
No shortage of cotton wool	Bongo Talensi	13 46.4	4 14.3	6 21.4	23 82.1
TOTAL	Bongo Talensi	14 50.0	6 21.4	8 28.6	28 100.0

4.3.4. Information elements on logistic and supplies reflecting risk to the provider by district.

In Figure 7, 1(5.3%) of respondents in Bongo and 6(66.6%) in Talensi Nabdam said there are less than 10 SBs in place, 6(31.6%) in Bongo and 3(33.3%) in Talensi Nabdam had needle stick injuries. Only Bongo district had 5(6.9%) of respondents complain of shortage cotton wool. The use of syringe wrappers as substitute for cotton wool were reported in among 4(21%) of respondents in Bongo district. Thirteen(68.4%) of respondents in Bongo and 5(55.5%) of respondents in Talensi Nabdam said they had adequate supply of syringes and needles. Three (15.8%) of respondents in Bongo and 2(22.2%) in Talensi Nabdam had shortages of syringes and needles for reconstitution in the past three

months [Figure 7].

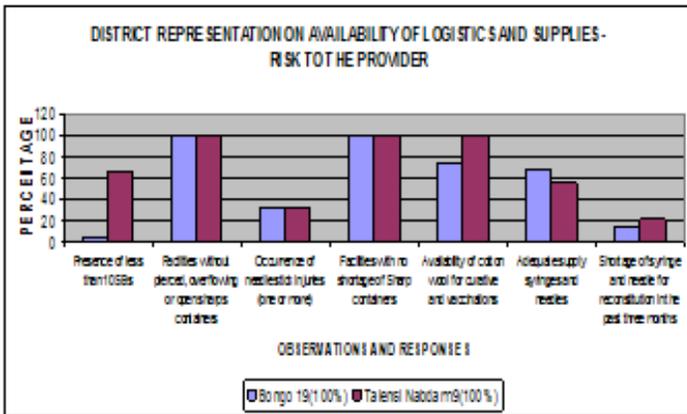


Figure 7: Availability of logistics and supplies by district reflecting risk to the provider

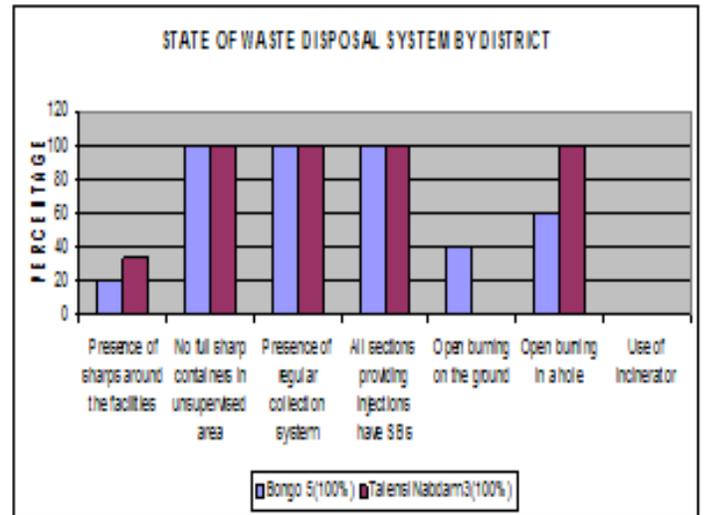


Figure 9: State of Waste Disposal System in Bongo and Talensi Districts

4.4 ASSESSMENT OF WASTE DISPOSAL SYSTEM OF THE FACILITIES

Eight facilities were assessed in the two districts. There were 2(25%) facilities that had sharps around the facilities. Also all of them used low temperature burning for the sharps. There was no use of incinerators in the districts. The two facilities in Bongo and Talensi Nabdam who had incinerators were not using them at the time of the survey. However, all the facilities had regular collection of SBs, full sharp containers in unsupervised areas, have. All the facilities apply low temperature burning either on the ground or in a hole [Figure 8].

4.4.1 Information elements on management and disposal of injection waste by district reflecting risk to the community

Figure 9 below shows that both districts have 1(20%) facility in Bongo and 1(33.3%) in Talensi had sharps around them. All the facilities in the two districts had no full sharps containers in unsupervised area; had regular collection systems and all sections providing injections had SBs in place. Two (40%) facilities in Bongo only had low temperature burning on open ground whiles 3(60%) and 3(100%) in Bongo and Talensi Nabdam respectively had low temperature burning in holes. None of the districts used their incinerators at the time of the survey.

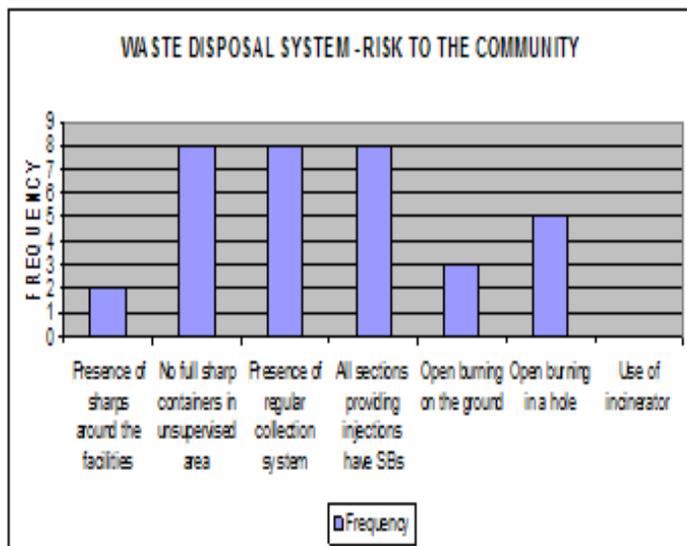


Figure 8: Waste disposal system of facilities reflecting risk to the community

4.5 DESCRIPTION OF MANAGEMENT SYSTEMS THAT PROMOTE

INJECTION SAFETY PRACTICE

4.5.1 Description of management system that promote injection safety at the Facilities

Management system that promotes injection safety at the facilities, it came out that none of the facilities had written plans for injection safety activities. None of them had good waste disposal system for the sharps. There was also no copy of injection safety policy document in the facilities. Although documentary evidence was lacking, they claimed they provide adequate resources for injection safety activities [Figure 10].

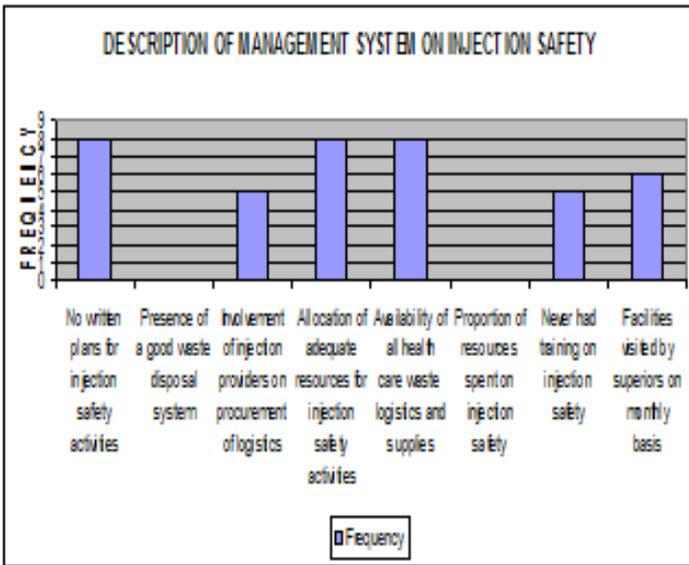


Figure 10: Graph showing the description of management system that promotes Injection safety

4.5.2 Description of management system that promote injection safety at the facilities by district

Figure 11 explains the management system of facilities by district that promotes injection safety. The facilities in the two districts had no good waste disposal system and they could not provide documentary evidence of allocation adequate resources for injection safety activities.

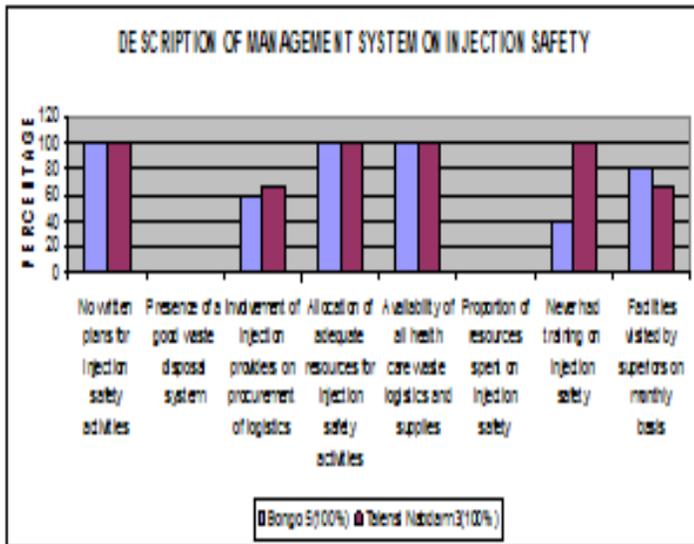


Figure 11: Management system that promotes injection safety by district

4.6 PLANNING, TECHNICAL SUPPORT AND SUPERVISION

4.6.1 Elements of planning, technical support and supervision by facilities

Figure 12 indicates that 3(10.7%) of the staff said they are consulted on logistics and supplies provided to them, 19(67.9%) said they provide feedback on the injection

supplies, 20(71.4%) of them said they benefit from period technical support on injection safety, 17(60.7%) of them said they have been trained on injection safety. 25(89.3%) of them demonstrated knowledge on injection safety policy. Nineteen (67.9%) of the respondents said they benefited from periodic supervision from superiors.

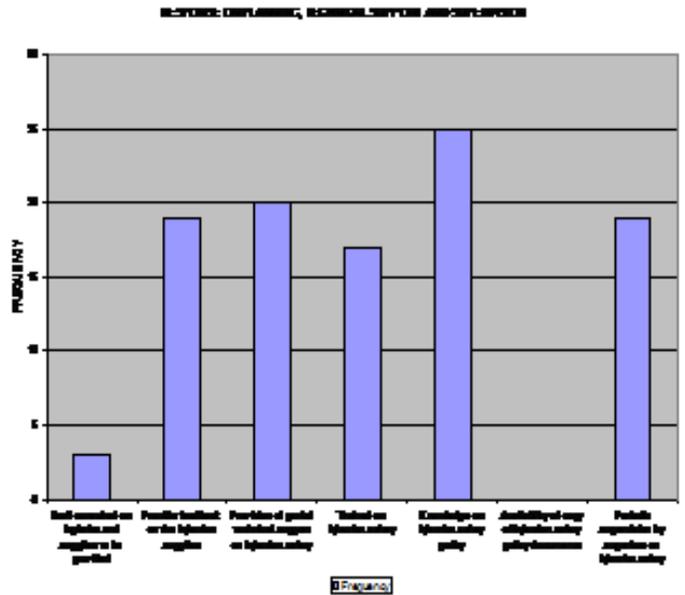


Figure 12: Response on Planning, Technical support and Supervision

Figure 13 shows that Bongo district has a better Planning, technical support and supervision system as majority of the indicators are higher for Bongo district than for Talensi. However, it is worth noting that none of the districts had injection safety policy document at their facilities

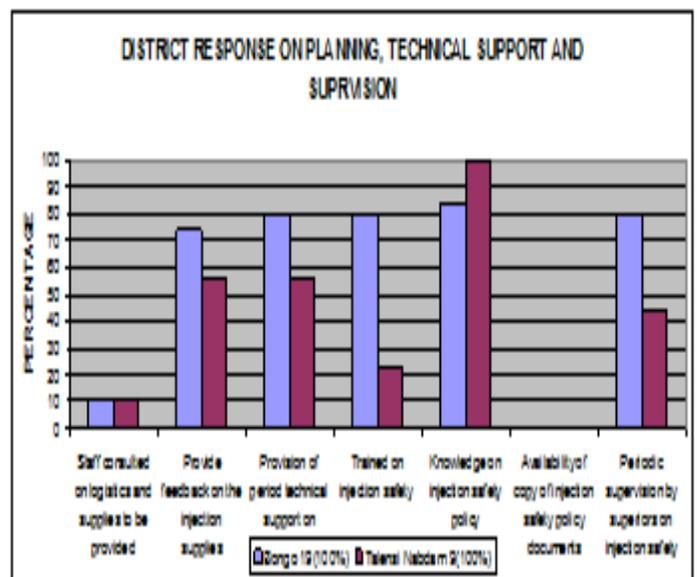


Figure 13: Response on Planning, Technical support and supervision by district

5.0 DISCUSSIONS

5.1 Risk to the providers

Safety practice

Two hand recapping were observed in 3(10.7%) respondents. Two of these were in Talensi Nabdam and the other one was in Bongo district. This compares to 8.7% of staff observed in immunization and 16.67% of curative settings in the national survey (Antwi et. al; 2003). It was noted that 27(96.4%) collected sharps in SBs immediately after injections and there were no sharps in open container; and 84.1% of respondents used SBs immediately after injections.

5.2 Injection Logistics and supplies

Findings on logistics and supplies on the safety of provider, shows that 7(25%) of the respondents had less than 10 SBs at the time of the visit, 9(32.1%) had one or more needle stick injuries in the last one year. There was no facility with overflowing, pierced or open containers and there was no shortage of SBs. Twenty-three (82.1%) had cotton wool available for curative and preventive services. Five (17.9%) of respondents had shortage of cotton wool within the last three months 4(80%) of them used syringe wrappers in place of cotton wool during the shortage. Five (17.9%) experienced shortage of cotton wool in the previous three months, 4(80%) of them are from the preventive section of the facilities. This situation is very disturbing because the preventive section of the facilities provide the bulk of the immunization services for children under one and pregnant women and required adequate supply of logistics to carry out safe injections. The staff at the preventive section got resources such as cotton wool and syringe and needles for reconstitution only when the preventive section has enough to share. This makes them to hold on to the little available and possibly expose themselves and the recipients to the risk of infections. The use of syringe wrappers in place of cotton wool is a crude innovation by the preventive nurses. They use the paper part of the sterile packet housing the syringe and needle in place of cotton wool after injection to stop bleeding at the site of injection. Mothers or pregnant women are made to use their fingers to press on the site to stop bleeding after injection in the absence of cotton wool. Some of the community health nurses interviewed who confirmed the practice mentioned that they learnt it from their seniors practicing those innovations. This presupposes that they are not likely to take any steps at requesting for needed logistics like cotton since they see that situation as normal. Five (17.9%) had shortage of syringes and needles for reconstitution in the past three months. Intermittent shortage and inadequate supply of some logistics has contributed to exposure of providers to some amount of risk. About 1(5.3%) of respondents in Bongo and 6(66.6%) Talensi Nabdam had less than 10 SBs in place, 6(31.6%) in Bongo and 3(33.3%) in Talensi Nabdam had needle stick injuries. Talensi Nabdam district therefore had more stocking problem at the facilities than Bongo district. Only Bongo district had 5(6.9%) respondents who complained of shortage of cotton wool. The use of syringe wrappers as substitute for cotton wool were reported in among 4(21%) of respondents in Bongo district. Thirteen (68.4%) respondents in Bongo and 5(55.5%) of respondents in Talensi Nabdam said they had adequate supply of syringes and needles. Three (15.8%) respondents in Bongo and 2(22.2%) in Talensi Nabdam had shortages of syringes and needles for reconstitution in the past three

months. There were logistics challenges in the two districts. The DHMTs are using the demand pull approach in supplies to all the facilities and CHPS centres where they are required to make request for logistics as and when needed. But due to distance, work load, transportation and other difficulties the facilities delay in going for additional stocks from the district stores causing shortages.

5.3 Risk to the community

The disposal of injection waste from the health facility is a final and critical component of injection safety activities. The disposal of the sharps and other injection waste are supposed to be done in such a manner that would insulate the community from harm through exposure to sharps. Assessing the waste disposal system involved eight facilities, 2(25%) of them had sharps at the disposal site. However, none of the facilities had full sharp containers in unsupervised areas and they all had regular collection of SBs from the injection rooms and outreach sites to the disposal sites. At the disposal sites of these 2 facilities, there were massive deposit of used sharps which were left unattended and unprotected. It brings into contrast the collection system at the injection rooms and the use of SBs since these sharps were without SBs and appeared to have been dumped from open containers. Coincidentally, these two facilities have incinerators but were not in use at the time of the visit. The disposal of the syringes appeared to be a routine endeavour because the sharps were poured into a public waste collection bin sited in the facility. The problem of waste disposal brings into focus the attention given to the disposal of sharps from the injection rooms. Monitoring and supervision of disposal sites appeared relegated and therefore challenges that occur at the sites do not get resolved. All the facilities apply low temperature burning either on the ground or in a dug hole.

5.4 Management issues

Facilities were to show evidence of action plan that included among other activities the maintenance safety in injection procedures, the collection and final disposal. But contrarily, 8 (100%) facilities had no written plans for injection safety activities. Obviously, without safety plans in place, the facility had very poor waste disposal system. The state of the disposal sites portrayed the level of attention and seriousness attached to the place. This was evident in the manner in which massive sharps were dumped without SBs, unattended and unsecured. Some of the facilities have other waste mixed up with sharps that are not yet burnt. The sites were clearly not supervised routinely. On the involvement of injection providers in procurement, 5(62.5%) of the facilities involved injection providers in procuring logistics. This is to ensure that the right equipment and quantity are procured. It was noted also that there was no injection safety policy as well as Healthcare waste management policy documents in the facilities. All the facilities could not show documentary evidence of allocation of resources for injection safety activities; however they mentioned the purchase of energy for burning injection waste and the provision of healthcare waste logistics and supplies. This situation is very debatable given the level of neglect at the disposal sites with lots of sharps and other injection wastes left unincinerated, unattended and unsecured. Five (62.5%) out of the 8 facilities said they had never organized or had any training on injection safety, but what really came out was the fact that almost all the staff have had one form of training that

had a component of it dealing with injection safety and infection control. Despite the fact that some of the facilities 6(75%) mentioned that they are visited by their superiors from the districts and regions on monthly basis, such visits did not target issues of injection safety. So, monitoring and supervision in the district was lacking.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

There were weaknesses in injection practices such as use of improvised items, reuse of syringes for reconstitution, shortage of logistics and supplies, unattended, open and unrestricted disposal sites leading to sharps scattered around disposal site and non-use of incinerators were clearly a problem. A weak and apathetic management style of facility heads were noticed. There was evidence of inadequate and complete shortages of injection logistics and supplies. Of major concerns were cotton wool, syringes and needles for reconstitution causing the staff to adopt some dangerous innovations which puts recipients at risk. Safety practice that borders on safety to the providers is encouraging as all the places where injections are given have SBs and staff immediately dispose used syringes in them. However two-hand recapping still exists among some of the staff. Shortages and unavailability of cotton wool posed serious risk to the providers through the use of improved methods. Needle sticks injuries have been recorded even in almost all places where injections were given. Low temperature burning were recorded in all facilities and non use of incinerators for sharp disposal and inappropriate disposal of sharps. Disposal of injection materials were critical issues in the sites; they were not adequately catered.

6.2 RECOMMENDATIONS

- There is the need for adequate logistics [e.g. cotton wool and syringes and needles] for reconstitution to improve on the safety of both the recipient and providers.
- Staff in the districts who are involved in injections need to be retrained on injection safety.
- Orientation for newly recruited Community Health Nurses and general nurses should include injection safety practices so as to minimize some of the risky behaviours.
- The districts must review the waste disposal system of the facilities.
- Districts may consider pulling of all sharp boxes to for incineration.

7.0 REFERENCES

- [1]. Antwi Agyei et al, (2003). Injection safety and Healthcare waste assessment in Ghana - K.O 2003
- [2]. Children's Vaccine Program at PATH: www.childreenvaccine.org/html/safe_injection.htm
- [3]. Dicko M, Oni AQ, Ganivet S, Kone S, Pierre L, Jacquet B. (2000). Safety of immunization injections in Africa: not simply a problem of logistics. Bulletin of the World Health Organization; 78:163-9.
- [4]. GAVI (2009). Achieving effective sharps waste management in GAVI host countries,
- [5]. Hauri, AM; Armstrong, GL; Hutin, YJ. (2004). The global burden of disease attributable to contaminated injections given in health care settings. Int J STD AIDS. 2004;15:7-16. doi: 10.1258/095646204322637182. [\[PubMed\] http://www.worldbank.org/data/countrydata/aag/khm_aag.pdf](http://www.worldbank.org/data/countrydata/aag/khm_aag.pdf)
- [6]. Hutin, Y; Hauri, A; Chiarello, L; Catlin, M; Stilwell, B; Ghebrehiwet, T; Garner, J. (2000). Injection Safety Best Practices Development Group. Best infection control practices for intradermal, subcutaneous, and intramuscular needle injections. Bull World Health Organ. 2003;81:491-500. [\[PubMed\]](#)
- [7]. Hutin, YJ; Hauri, AM; Armstrong, GL. (2000). Use of injections in healthcare settings worldwide, 2000: literature review and regional estimates. BMJ. 2003;327:1075. doi: 10.1136/bmj.327.7423.1075. [\[PubMed\]](#)
- [8]. Immunization Essentials (2003). A Practical field Guide. 2003
- [9]. Immunization Newsletter (2008). vol xxx, number 3, June
- [10]. Jagger J, Hunt EH, Brand-Elnaggar J, Pearson, R.D. (1988). Rates of needle-stick injury caused by various devices in a university hospital. *N Engl J Med* 1988; **319**: 284-288. [\[Abstract\]](#)
- [11]. Kane A, Lloyd J, Zaffran M, Simonsen L, Kane M. (1999). Transmission of hepatitis B, hepatitis C and human immuno-deficiency viruses through unsafe injections in the developing world: Model-based regional estimates. Bulletin of the World Health Organization 1999, 77:801-807.
- [12]. Kenya Injection Safety and Immunization (2005). Waste Management Plan Of Action, 2001 - 2005
- [13]. Lakshmi R. (2005). India's vaccines come with risk: dirty needles used for immunization can spread other diseases. *The Washington Post*. February 9, 2005:A18.
- [14]. Logez, S. (2001). the proceedings of the 3rd Annual International SIGN meeting: 30-31 August 2001. New Delhi, India. WHO; 2001. Increased access to injection equipment in Burkina Faso; pp. 35-35.
- [15]. Muller N, (2005). United States Agency for International Development (USAID). *Evaluation of a Disposable Needle-Removal Device in Uganda*. A HealthTech Report. Seattle: PATH; 2005.
- [16]. Nazareth S, Rathi MK. Poking ; (1998). Danger: sharps handling and disposal [fact sheet]. New Delhi: Srishti.

- [17]. PATH Preventing needle sticks injuries, (Program for Appropriate Technology in Health), Prüss-Üstün A, Rapiti E, Hutin Y . (2003). *Global Burden of Disease from Sharps Injuries to Health-care Workers*. Geneva: WHO;. WHO Environmental Burden of Disease Series, No.3.
- [18]. Rich, J.D; Dickenson, B.P; Carney, J.M; Fisher, A. & Heimer, R. (1998). *AIDS* 12 (17) 2345-2350.
- [19]. Safe Injection Global Network (SIGN) www.injectionsafety.org
- [20]. WHO Strategy regarding injection safety. http://www.who.int/injection_safety/about/strategy/en/
- [21]. WHO, (2001). Safe Injection Global Network. *Injection Safety: First Do No Harm*. WHO/BCT/DCT/01.3. Geneva: WHO;.
- [22]. WHO. Strategy regarding injection safety. http://www.who.int/injection_safety/about/strategy/en/
- [23]. WHO. (2001). *Tool for the Assessment of Injection Safety: Basics II*. Geneva: WHO, 2001 (WHO/V&B/01.30).
- [24]. WHO. (200 2) Injection Practices: rapid assessment guide.. http://www.who.int/injection_safety/toolbox/en/RARG.pdf
- [25]. WHO. (2005). *Management of Solid Health-Care Waste at Primary Health Care Centers: A Decision-Making Guide*. IVB/PHE/WSH. Geneva: WHO; 2005.
- [26]. WHO (2005). *Safe Healthcare Waste Management: Policy Paper*. Geneva: WHO; 2004. Available at: http://www.healthcarewaste.org/en/160_hcw_policy.html. Accessed November 11, 2005.
- [27]. WHO/V&B/0.2.26 "First, do no harm" Introducing auto-disable syringes and ensuring injection safety in immunization systems of developing countries <http://www.who.int/vaccines-documents/DocsPDF02/www704.pdf>
<<http://www.sharpsinjury.com/hiv.htm> A Proposed Approach with Estimates of Costs, PATH, June 2009.