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GHAR GHAR MAA SWASTHYA

**Health Care Waste Management Assessment
at Sangini Outlets of Three Districts: Mugu, Sunsari and
Syangja of Nepal, May 2013**

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This study was conducted for the FHI 360/ Ghar Ghar Maa Swasthya (GGMS) Project. The overall objective of the survey was to conduct an assessment of health care waste management among CRS's Sangini franchising outlets. This study was conducted in 110 Sangini outlets of Sunsari, Syangja and Mugu districts.

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Abbreviations

AD	Auto-disable (referring to syringe)
BCC	Behavior Change Communication
CRS	Nepal Contraceptive Sales Company
FHI 360	Family Health International
FP	Family Planning
GGMS	Ghar Ghar Ma Swasthya
GoN	The Government of Nepal
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
MCH	Maternal and Child Health
N	Number
NGO	Non-Governmental Organization
NSI	Non-sharps Infectious (type of waste)
PEP	Post-Exposure Prophylaxis
PPE	Personal Protective Equipment
STI	Sexually Transmitted Infection
TB	Tuberculosis
TT	Tetanus Toxoid
USAID	United States Agency for International Development
VaRG	Valley Research Group
VDC	Village Development Committee

Executive summary

The Government of Nepal (GoN) endorses social marketing as an approach to ensuring access to essential public health products and services. USAID/Nepal's work in social marketing began in 1978 with the establishment of the Nepal Contraceptive Retail Sales Company (CRS), one of the oldest and most successful social marketing organizations in the world. CRS quickly established itself as a pioneer in health communications and marketing and played the key role in developing markets in Nepal for condoms, oral and injectable contraceptive products (Sangini), and oral rehydration salts.

Through the GGMS project, CRS manages the Sangini network of pharmacies – a social franchising network for family planning service delivery. Currently, there are approximately 3,300 pharmacy outlets in the Sangini network covering all 75 districts. The GGMS project seeks to improve systems for quality assurance and waste management related to FP and MCH products and services delivered through CRS.

It is in this context, the Health Care Waste Management (HCWM) study was carried out to conduct an assessment of health care waste management among CRS's Sangini franchising outlets on current sanitation situation at Sangini outlets, current waste handling practices by health workers/providers and other waste handlers, types of waste and amount of each generated, availability of guidelines for waste handling at outlets and compliance by the providers and waste handlers, level of awareness and attitudes of staff in proper waste management practices, types of equipment and resources available for handling and disposal of waste, incidence of sharps injuries among providers and other waste handlers including what safety measures they use, and, types of problems faced by Sangini outlets regarding proper waste disposal practices.

The assessment was carried interviewing 110 sangini injection providers and two person involved in waste handling in 110 of 134 Sangini outlets in three GGMS districts– Sunsari, Syangja and Mugu. The interview was conducted by trained interviewers using a structured questionnaire and observation checklist. Information collected from the interview were processed, cleaned and analyzed using SPSS. The frequency tables for all the variables were generated and the results were then interpreted for the selected key variables as per the objectives of the study.

The whole report is divided into seven chapters in which the first provides study description followed by the second chapter covering injections and injection practices; third chapter covering sharps waste management and safety boxes; fourth chapter covering management of non-sharps infectious (NSI) and general waste; fifth chapter covering equipment, materials, cleanliness and Resources; sixth chapter covering providers' perceptions, injuries and medical protection; and, the seventh chapter covering summary of results, conclusions and recommendations.

Study Findings:

Injections and Injection practices

- While almost all outlets are open five to seven days per week, a few are only open three days a week.
- On average, each outlet in Sunsari gives about four times more injections (and generates four times more sharps waste) per week than those in Mugu and Syangja. The more injections a provider gives, the more at risk s/he is.
- Generally, outlets have one place for injections, but some have more than one.
- Only half of these outlets (none in Mugu) seem to be using auto-disable syringes for (any) injections.
- Providers are aware that needles should not be reused and maintain they never do.
- One third (half in Sunsari) of providers said they always recapped needles after injection. In addition, the recappers in Sunsari are giving more injections per week than non-recappers. This practice increases chances of needle sticks. Stopping recapping is difficult worldwide, since providers were trained to recap when needles were reused; now that needles are no longer being reused, it is unnecessary.
- About 10% (only in Sunsari and Syangja) of providers are detaching the needle from the syringe, after giving injection. This is another way of increasing chances of needle sticks and not necessary from a waste management perspective.
- Used needles and syringes seem to be disposed of in containers. However, in Sunsari, a number of outlets had other loose sharp items which could cause injuries to providers and clients.
- Where disposable safety boxes are not used, providers are more likely to come into contact with used needles and/or syringes when they empty the containers.

Safety boxes

- There is no standard practice for what type of safety box is used. And most outlets in Syangja and Mugu use both disposable and non-disposable types, which most likely depends on what type of containers they receive. Where disposable safety boxes are not used, providers are more likely to come into contact with used sharps when they empty the containers.
- Safety boxes are not available in all facilities, nor in all injection areas in each facility (in those facilities with more than one injection area). Providers who carry used sharps from one place to dispose in another are at greater risk of needle sticks than those who have a safety box within arm's reach.
- While most outlets have orderly, self-contained sharps containers, some (7%) have at least one box that is overfilled or has equipment sticking out. A good proportion of providers say they wait to remove safety boxes until they are filled higher than they should.
- Significant out of stocks for safety boxes were found for outlets (half) in the last six months; for 19% of all outlets it seems to be a frequent occurrence.
- Most providers say they keep sharps waste in a bin or box when no safety box is available.

Waste disposal, segregation and storage

- There is no standard practice for final disposal of sharps or NSI waste.
 - The safety of the main method of open burning on the ground is questionable since it's not clear if it's thoroughly burnt or what is done with the waste after it's burnt.
 - In addition 13% of providers said their sharps waste and 33% said their NSI waste were collected by municipal/VDC, which could spread infection to both the waste handler and the public.
- No outlets had two-chamber medium or high temperature incinerators
- There is no standard practice for frequency of disposal of sharps or NSI waste. Sharps waste was disposed of less frequently than weekly by the majority (70%) of outlets and NSI waste was disposed of less frequently than weekly by 9% (41% in Mugu).
- Almost one-fourth of outlets are not separating sharps from other waste and 41% (almost 60% in Syangja) were not separating NSI waste from other waste.
- Almost half of outlets in Sunsari are not keeping sharps waste in safety boxes. 11% of outlets kept NSI in safety boxes.
- There is no standard practice in Sangini outlets as to how self-contained containers were, whether they were covered, nor if the sharps and NSI containers are kept somewhere where the public has no access.
- The number of safety boxes filled per week by outlet per district ranges from none to 10, with a median of .25 per outlet in Sunsari (where more injections are given but outlets are less likely to have safety boxes) to 1.5 in Mugu and 3 in Syangja. The number of containers of NSI generated ranged from .25 to 7 bins per week.
- A small proportion of outlets had NSI and mixed waste in containers outside the outlet, posing an infection risk to the greater community.
- In 38% of outlets (50% in Sunsari) waste containers were seen outside the outlet, 95% of which only had one container, which were mainly cartons. In almost all cases, these containers were self-contained and orderly, but in 14% (mostly in Sunsari) of outlets with containers outside were not self-contained.

Equipment, Materials, Cleanliness and Resources

- Low levels of PPEs were visible or used during visit of data collector with somewhat higher - but still low - levels of PPE available, with gloves, masks and aprons most common. However 29% (45% in Sunsari) said they don't use any PPEs. The remainder buy it themselves.
- No guidelines, job aids or BCC materials on the topic of waste handling were available in any of the outlets.
- Generally Sunsari and Syangja outlets had fairly clean floors in injection areas as well as outside the outlets. This was not the case for Mugu.
- Virtually all outlets (except for 4 in Syangja) had water available. About 30% used buckets with no tap, which means they need to dip into the bucket which is not sanitary.
- Half of the outlets in Mugu did not have electricity.

Providers' Perceptions, Injuries and Medical Protection

- 95% of providers said they were very concerned about getting an infection from used injection equipment.
- All providers knew they could get HIV/AIDS from a used needle and 91% mentioned Hepatitis B. 46% mentioned Hepatitis C and 41% mentioned tetanus.
- Over 90% of providers said they had received either Sangini or other in-service training on the HCWM at some point. Other sources of information come from media, materials and other health staff. Only about one-third of providers mentioned pre-service training, which ranged from 100% in Mugu to 69% in Syangja to 9% in Sunsari.
- Less than one-fourth of providers (but 83% in Mugu) said the most recent training they received was in the last two years. In Mugu the median for most recent training was 18 months ago, compared to 2 years in Syangja and 5 years in Sunsari.
- Those reporting HCWM training in the last 2 years were significantly more likely than others to practice protective behaviors including: not disposing of sharps waste via municipal vehicles (90%), burning non-sharps infectious waste in a pit or enclosure (90%), and never recapping (95%). In addition, the field teams observed that outlets with providers who had received training in last two years were significantly more likely (90%) than others to dispose of sharps waste in safety boxes.
- Providers gave multiple answers when asked what issues they had. The lack of an incinerator topped the issues (57%), followed by the lack/shortage of safety boxes (53%), lack of land area for burial (49%), and lack of fuel (33%).
- Providers gave similar suggestions for how to improve HCWM, which group together into categories of supplies/equipment, disposal and training/monitoring.
- Twenty percent of providers reported ever having a needle stick, with 32% of these in the last year. Among the 9 with needle sticks in the last year, only 50% received PEP.
- Only 56% had ever received an Hepatitis B vaccine, with only 72% of those receiving at least the necessary 3 injections.
- Virtually all providers received Tetanus vaccines. However, 16% received them more than 10 years ago and are therefore likely no longer protected.

Conclusions

- There is no evidence of reuse of needles/syringes at these outlets.
- Providers are aware of health care waste management dangers in their outlet and concerned about the consequences to themselves.
- Providers know they should segregate and destroy sharps and non-sharps infectious (NSI) waste. Most are doing so with sharps; fewer are segregating NSI waste.
- However, there are no effective systems in place nor standards observed related to:
 - Segregation or destruction of sharps and NSI waste; some outlets put them in general waste for the municipal/VDC vehicles to collect
 - Provision of supplies and equipment to better segregate and destroy sharps and NSI waste. Many outlets did not have safety boxes at the time of the visit and

- 19% of outlets report this is a frequent occurrence. There is no standard container supplied for NSIs, which makes it harder for providers to segregate NSIs.
- Training on HCWM; some report never being trained on the subject; only one-third (all in Mugu) mention having received any pre-service training in HCWM
 - Many providers say they are not following important protective behaviors:
 - many are recapping
 - some are separating the needles from the syringe after giving injections
 - few are using PPEs
 - insufficient numbers are receiving PEP after needle sticks or getting all three Hepatitis B vaccines or keeping their tetanus protection up to date
 - Most providers made multiple suggestions how to improve HCWM, focused on better systems for segregation, destruction and training/supervision, many of which are included in the recommendations section.

Recommendations

- A. Develop HCWM guidelines for segregation, storage and regular, effective final disposal of sharps and NSI waste and improved protective behaviors for Sangini outlets.
- B. Outline a strategy to implement a more systematic approach to segregation and disposal of sharps and NSI waste.
 1. Consider a district-wide intervention, including a contract with a private company/NGO to collect sharps and NSI waste once a week (possibly twice a week for outlets giving a lot of injections) and take them to an official incinerator for destruction. During this weekly visit, the contractor would also provide each outlet with adequate quantities of empty disposable safety boxes for sharps and thick plastic bags of a unique, standard color that the outlets would put inside some container to segregate NSIs.
 2. The purpose for the **thick plastic bags** of a unique, standard color is three-fold:
 - To easily identify which is the NSI waste,
 - To keep NSI waste safely contained within the bag, and
 - To make it easy to collect and transport NSI waste.
 3. **Disposable safety boxes** are strongly recommended as they provide the most safety, since they are covered, self-contained and can be burned with all the contents inside. Therefore, once the injection is over and the provider puts the needle and syringe through the small hole in the safety box, no one is further exposed to them. Non-disposable boxes are more likely to result in needle sticks for the following reasons:
 - The providers need to either keep the lid off or remove the lid and put it back on each time that they dispose of a needle;
 - The bucket is likely to overturn, resulting in someone having to pick up all the needles and syringes and put them back in each time;
 - When providers dispose of sharps from a non-disposable box, they are likely to come in contact with the needles and/or syringes when removing them from the bucket.

4. **Other recommendations for segregation, storage and disposal** of waste are:

- Ensure that visits to outlets (for supplies, disposal and supervision) are made on days when the outlets are open.
- Plan for outlets with more than one injection place – by providing supplies of safety boxes, NSI plastic bags, posters, etc. for each location.
- Assure that each Sangini outlet continues to receive one auto disable syringe for each vial of Sangini and that encourage them to use the AD syringe to give Sangini.
- Keep all waste containers away from public areas, and closed, with waste completely contained inside to minimize infection possibilities.
- Keep all waste inside outlets, except when pickups scheduled. Any waste left outside outlets should be orderly, closed, and completely within any container.

A. Consider providing supplying specific equipment, materials, and resources, such as:

- Aprons (PPE) are durable, reusable and can be effective preventing infection while administering injections. They could also be branded “Sangini” and therefore serve as a marketing tool in addition to protecting the provider.
- Job aids/BCC materials can remind providers about the importance of safe handling of sharps, segregating and safe disposal of sharps and NSI wastes.
- Buckets with taps to those outlets using buckets with no taps, to decrease the risk of infection.

B. Develop and implement more focused HCWM training. Start training those who have not received any recently. Among the three districts, the highest need for training in the short-time is in Sunsari, followed by Syangja.

1. Provide **positive reinforcement** to providers regarding their overall good practice of not reusing needles.
2. Without making providers scared, use their concern about getting an infection from used injection equipment to **motivate safer injection and waste handling practices**. Emphasize that “it’s in their hands” to reduce their chances of infection.
3. Since each time they handle a needle/syringe they and their patients may be at risk of infection, it’s important to motivate providers to **ALWAYS do the following protective actions:**
 - Not recap needles after injection (recapping is no longer necessary, now that needles are not being reused)
 - Not separate needles from syringes
 - Throw needle and syringe immediately into disposable safety box
 - Put NSI waste immediately into container with X color plastic bag

- Keep all waste, especially sharps and NSI waste, well-contained and away from the public.
 - Check all injection locations every morning to make sure if any new safety boxes or plastic bags for NSI will be needed and prepare them before opening the outlet.
 - Make sure to remove safety boxes when the contents reach the line on the front and NSI bags when full enough so that they still close.
 - In addition, no sharp materials (like scissors, razor blades, etc.) should be kept in open containers or lying around loose.
4. Explain and demonstrate the importance to their safety of using PPEs. Indicate which, if any PPE will be provided. Show them each type of PPE, even if it will not be provided, explain the value/purpose of each and ask them to practice putting them on and to discuss when they would use it.
 5. Provide more information about what might happen as a result of needlesticks and encourage Sangini providers to access **PEP** in case of need. Help them determine where they can do this.
 6. Provide information about the importance of getting all three Hepatitis B doses once as well as Tetanus boosters every 10 years. Help them determine where they can do this.
 7. As part of the training, have them practice assembling safety boxes, placing boxes and bags in appropriate places, giving injections to oranges or other fruit and dispose of equipment, include exercises on what types of waste is sharps/NSIs and general, using PPEs, etc.

C. Work with pre-service training authorities to adapt the elements of the Sangini training module on HCWM for their training of Certified Medical Assistants.

D. Develop reminder materials to encourage improved segregation, protective post-injection behaviors and how to access PEP, Hepatitis B and Tetanus

1. Develop and pretest a poster which covers the five key protective behaviors listed above with clear images, including images of what exactly NSI waste is.
2. Develop a referral card to encourage providers to get PEP, Hep B and Tetanus injections, including information on where specifically they can get it.

E. Revise supervision checklist to include the key protective behaviors and other HCWM guidelines and train supervisors how to address these during their regular monitoring visits.

1. **Supervisors should make sure to reinforce all of the elements of protective post-injection behaviors, supplies and resources for treatment/prevention during each visit.**
 - The supervisor should check with each provider as to what done for the last needle stick as well as how many Hepatitis B injections the provider has as

well as when they had their last tetanus injection, and remind them of when they should get them and where.

- The supervisor should observe presence of and proper use of whatever equipment has been provided and/or recommended.
- The supervisor should also work with the outlet providers to determine how to keep the premises clean, especially in districts like Mugu.

Chapter 1: Study description

1.1 Background

The Government of Nepal (GoN) endorses social marketing as an approach to ensuring access to essential public health products and services. USAID/Nepal's work in social marketing began in 1978 with the establishment of the Nepal Contraceptive Retail Sales Company (CRS), one of the oldest and most successful social marketing organizations in the world. CRS quickly established itself as a pioneer in health communications and marketing and played the key role in developing markets in Nepal for condoms, oral and injectable contraceptive products (Sangini), and oral rehydration salts.

USAID's *Ghar Ghar Maa Swasthya* (GGMS), or Healthy Homes project, seeks to graduate CRS to become a financially viable private sector company and also to increase the availability and accessibility of health products in 49 selected hard-to-reach districts. The program will assist the GoN to expand the depth, reach, and impact of the private sector in social marketing, and provide low-cost maternal and child health, family planning, and HIV prevention products and services.

Through the GGMS project, CRS manages the Sangini network of pharmacies – a social franchising network for family planning service delivery. Currently, there are approximately 3,300 pharmacy outlets in the Sangini network covering all 75 districts. According to the Nepal Demographic and Health Survey (2011), private pharmacies are a major source of contraceptives. Approximately 12% of users of modern contraceptives aged 15-49 obtained their contraceptive products from private pharmacies. A key project indicator for the GGMS performance measurement plan is to increase the percentage of franchise outlets that meets minimum quality assurance standards for FP/MCH product and provision of care.

The GGMS project seeks to improve systems for quality assurance and waste management related to FP and MCH products and services delivered through CRS.

1.2 Objectives of the study

The primary objective of the survey was to conduct an assessment of health care waste management among CRS's Sangini franchising outlets.

The specific objectives of the survey were to assess the following dimensions in health care waste management:

- a) To explore the current sanitation situation at Sangini outlets
- b) To explore the current waste handling practices by health workers/providers and other waste handlers, when present
- c) To delineate the types of waste and amount of each generated
- d) To identify the availability of guidelines for waste handling at outlets and compliance by the providers and waste handlers

- e) To describe the level of awareness and attitudes of staff in proper waste management practices
- f) To determine the types of equipment and resources available for handling and disposal of waste
- g) To determine the incidence of sharps injuries among providers and other waste handlers including what safety measures they use
- h) To identify the types of problems faced by Sangini outlets regarding proper waste disposal practices, and
- i) To recommend ways to improve waste management practices at Sangini outlets.

1.3 Methodology

Sampling of outlets

The assessment was carried out in three GGMS districts– Sunsari from Eastern Terai, Syangja from Western Hills and Mugu from Mid-western Mountain. There were a total of 134 Sangini outlets in these three districts. As the number of outlets in Syangja and Mugu were reasonably small, it was planned to include all outlets from these two districts plus about three-fourths of the outlets in Sunsari were randomly selected for inclusion, for a total of 115 Sangini outlets (66 from Sunsari, 14 from Mugu and 34 from Syangja).

However, only 110 outlets (66 from Sunsari, 12 from Mugu and 32 from Syangja) were successfully assessed. Even in Sunsari district, the field team had to visit all 86 outlets in order to meet the target sample size. The reasons for not being able to assess the 24 planned outlets that were not included were:

- There was no Sangini-trained provider currently giving injectable shots at these facilities (10 in Sunsari and 1 in Mugu)
- Currently services not available from the outlet (2 in Sunsari)
- Outlet not existent (3 in Sunsari, 1 in Mugu)
- Could not locate outlets (4 in Sunsari; 1 in Syangja)
- Repetition, same name in the outlet list (1 in Sunsari)
- Provider's unwillingness to be interviewed (1 in Syangja)

The total numbers of Sangini outlets as well as those that were planned and actually observed/interviewed in this study are given in Table 1.1.

Table 1.1 Number of total and sampled Sangini outlets by districts

District	Geographic Area	Ecological Region	No. of Sangini outlets	Planned no. of sample outlets	Actual no. of sample outlets
Sunsari	Terai	Eastern	86	67	66
Mugu	Mountain	Mid-western	14	14	12
Syangja	Hills	Western	34	34	32
Total			134	115	110

Selection of the respondents

Typically in a Sangini outlet, it was expected that the Sangini (injectable) provider would be interviewed, and in cases where there was another person involved in waste handling, that person would also be provided. In the 110 outlets visited, there were only two outlets, both in Sunsari, where there was someone other than the provider handling the waste and in those two outlets, both people were included. None of the outlets had more than one provider present.

Survey instrument

One set of survey tools consisting of structured questionnaire and observation checklist with questions was provided by FHI 360/GGMS. After translation (by VaRG senior researcher), the tools were pre-tested by the research assistants at 7 different Sangini outlets in the Kathmandu Valley in November 11 and 12, 2012. The questionnaire has five sections, namely:

Section 1: Observation of equipment, supplies and waste management

Section 2: Questionnaire relating to injections, equipment, supplies and directives

Section 3: Questionnaire on waste generation, segregation and its final disposal

Section 4: Exposure to knowledge and attitudes of Sangini providers at the outlet

Section 5: Exposure to knowledge and attitudes of non-providers (waste handlers) at the outlet

1.4 Field organization

Recruitment and training of field staff

Six field staff with knowledge and experience in conducting field survey at VaRG were recruited through interview. They were given training for 3 days November 11 to 13, 2012 in Kathmandu. Training topics included: Orientation to Health Care Waste Management, Objectives of the Study and Methodology, Introduction to Consent Form, Review of instrument section by section, Role Play, and Ethical issues related to human subjects research. (See Annex 1 for training schedule.) A manual for the interviewers was prepared to serve as a reference material for the field staff in order to standardize their data collection process.

Data collection

A field work schedule was prepared and the field team mobilized according to the plan. Three teams, one per district, were formed, each consisting of two field research assistants. An operational plan specifying the procedures for collecting and managing data, including keeping a log of data collection activities, and securing data to ensure its quality and confidentiality was developed.

Data collection was carried out during between November 17 and December 16, 2012. The survey was administered using face-to-face interview method. All interviews were conducted at the providers' place of work using a structured questionnaire and observation checklist in Nepali. Before the start of the interview, the interviewers explained the study and obtained written consent. Topic covered in the informed consent included: about the purpose of the survey, how long the visit would take, that their responses would be kept confidential, what risks and benefits there were and that they were not required to participate and did not have to answer any questions they did not want to. After completing the interviews, questionnaires were checked and edited for

completeness and consistency of collected information. Privacy and confidentiality of the discussion was maintained during data collection.

The senior team members visited some of the sites of Sunsari district (from November 24-27, 2012) to supervise the data collection activities. In addition, staff from FHI 360 visited Syangja district from 26-30 November, 2012. A system of frequent two-way communication between the field team and VaRG was ensured by telephone/mobile phone and other communication methods in order to provide additional guidance, timely support and feedback on problems (such as data collection time management in the field including planning how to cover the outlets, revisiting the outlets if no one was there, etc.) faced during field work.

1.5 Data processing and analysis

The field-edited questionnaires were again edited at VaRG for thorough consistency and completeness. Data entry and cleaning programs were developed and tested. Data were entered/processed using FoxPro and SPSS software packages. A number of quality check mechanisms such as range were developed and used to detect any errors in data entry. The cleaned data set was transferred to SPSS and a SPSS system file for output generation. The frequency tables for all the variables were generated. The results were then interpreted for the selected key variables as per the objectives of the study.

Chapter 2: Number of injections and injection practices

This chapter deals with the Sangini injections and practices of giving injections at the 110 outlets in the study from three project districts (66 from Sunsari, 12 from Mugu and 32 from Syangja). Results about recapping of needles, reuse of needles/syringes and loose sharps are also presented in this chapter.

2.1 Injections and injection rooms

The distribution of Sangini outlets open by number of days in a week is given in Table 2.1. Almost all (95%) of the Sangini outlets were open 7 days a week. One outlet in Sunsari and two outlets in Syangja were open for six days a week. In Mugu district, there was one outlet which opened for three days a week and another for five days a week.

Table 2.1 Distribution of Sangini outlets open by number of days in a week

Number of days a week the out let is open	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
3	-	-	8.3	1	3.1	1	1.8	2
5	-	-	8.3	1	-	-	0.9	1
6	1.5	1	-	-	6.3	2	2.7	3
7	98.5	65	83.3	10	90.6	29	94.5	104
Total	100.0	66	100.0	12	100.0	32	100.0	110

In the survey the providers were asked the approximate number of injections given in a week. The results varied widely, ranging from 0 to 350 injections a week, with a median of 35 per week. By district, Sunsari clinics gave the most injections with 50% of the clinics giving 60 or more injections a week and 21% giving 106 to 350 per week, with a median of 55. In Mugu, none of the outlets reported giving 60 or more injections per week, with a median of 20. In Syangja, only 9% (three clinics) reported giving 60-105 injections per week, and 72% reported giving less than 20 injections per week, with a median of 11.

Table 2.2 Distribution of Sangini outlets by number of injections given in a week

Number of injections given in during an average week	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Less than 20	15.2	10	41.7	5	71.9	23	34.5	38
20-39	15.2	10	41.7	5	15.6	5	18.2	20
40-59	19.7	13	16.7	2	3.1	1	14.5	16
60-80	12.1	8	-	-	6.3	2	9.1	10
81-105	16.7	11	-	-	3.1	1	10.9	12
106+	21.2	14	-	-	-	-	12.7	14
Range	1-350		5-40		0-90		0-350	
Mean	83.5		21.9		18.0		57.8	
(SD)	(75.4)		(12.8)		(22.9)		(67.6)	
Median	55.0		20.0		11.0		35.0	
Total	100.0	66	100.0	12	100.0	32	100.0	110

With regards to the number of places within an outlet to give injections, almost all (90%) gave injections in one place. (Table 2.3) Six other outlets in Sunsari reported two places and one mentioned having four injection places. Four outlets in Syangja reported giving injections in two places inside the outlet.

Table 2.3 Distribution of Sangini outlets by number of places available for giving injections

Number of places available for giving injections	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
1	89.4	59	100.0	12	87.5	28	90.0	99
2	9.1	6	-	-	12.5	4	9.1	10
4	1.5	1	-	-	-	-	0.9	1
Total	100.0	66	100.0	12	100.0	32	100.0	110

The survey team also observed the number injection places in each sampled outlet during data collection. The observations showed the same results as reported by the providers. (Q 104: table data not shown).

The types of syringes used in the Sangini outlets were explored during the survey. All outlets in the study reported using standard disposable syringes (Table 2.4). No outlets in Mugu reported using auto-disable (AD) needles, compared to half in Sunsari and most (84%) in Syangja (84%). It is CRS policy to supply one AD syringe for each vial of Sangini.

Table 2.4 Distribution of Sangini outlets by types of syringes used in the outlets

Types of syringes used in the outlet (Multiple Response)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Standard disposable	100.0	66	100.0	12	100.0	32	100.0	110
Reuse prevention / auto disable	48.5	32	-	-	84.4	27	53.6	59
Reuse and needle stick injury prevention / retractable	-	-	-	-	-	-	-	-
Total (n)	-	66	-	12	-	32	-	110

2.2 Re-use of needles, recapping and use of needle cutters

The evidence for sterilizing injection equipment was explored during the survey. No clear signs of sterilization were found at any outlets during the visit. (The evidence for sterilization include: needles or syringes in a steam sterilizer, autoclave, boiler, pot, or dish of water, and: any bulging or discolored syringes. In some Sunsari outlets, scissors were seen in bowls or tin boxes, which could be used for sterilization (Data not shown).

Table 2.5 Distribution of Sangini outlets by evidence of sterilizing the injection equipment

Whether there was any evidence that an attempt is being made to sterilize injection equipment for reuse	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Yes	-	-	-	-	-	-	-	-
No	100.0	66	100.0	12	100.0	32	100.0	110
Total	100.0	66	100.0	12	100.0	32	100.0	110

Similarly, respondents in all the Sangini outlets reported that they never reused needles and syringes after giving an injection. (data table not shown).

When asked about what they did with sharps and syringes immediately after giving an injection, the almost all providers (87%; 100% in Mugu) reported throwing both sharps and syringes into safety boxes without detaching the needles from syringes. Providers in nine outlets (6 in Sunsari and 3 in Syangja) said they removed the needles from the syringes by hand and put the needles in (safety) containers and the syringes in general trash. Removing needles from syringes is a risky behavior for the provider. In addition, if the syringes are put in general trash it could transmit disease to the general public. Only one provider (from Sunsari district) reported cutting the needles with a needle cutter and putting the needle into a different container and the syringes in the general trash. (Table 2.6).

Table 2.6 Distribution of Sangini outlets by what they do with needles and syringes after giving an injection

What is done with needles and syringes immediately after giving an injection	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Throw them both (without detaching needle from syringe) into safety box	83.3	55	100.0	12	90.6	29	87.3	96
Remove the needle from the syringe by hand and put needle into other container and put the syringe in general trash	9.1	6	-	-	9.4	3	8.2	9
Cut the needle with needle cutter into other container and put the syringe in general trash	1.5	1	-	-	-	-	0.9	1
4= Other§	6.1	4	-	-	-	-	3.6	4
Total	100.0	66	100.0	12	100.0	32	100.0	110

Note: § Other includes: throw into bucket (or carton) without detaching needle from syringe; throw into safety box after detaching needle from syringe.

The data collection team observed the presence of a needle remover in two outlets, one in Mugu district and one in Syangja district (Data table not shown). Despite the presence of these two needle removers in the two other districts, only one provider in Sunsari reported ever using a needle cutter and he said he used it sometimes. (Data table not shown).

Approximately one-third of the providers stated that they “always” recapped the needles after giving an injection. By district, this practice was highest (50%) in Sunsari. Recapping is another

high risk behavior for providers; while it used to be standard operating procedure, efforts are now being made to get providers to discontinue recapping. The great majority of providers in Mugu (83%) and Syangja (75%) and 47% in Sunsari reported never recapping needles after giving an injection (Table 2.7).

Table 2.7 Distribution of Sangini outlets by frequency of recapping needle after giving an injection

How often do you recap the needle after giving injection?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Always	50.0	33	-	-	12.5	4	33.6	37
Sometimes	4.5	3	16.7	2	12.5	4	8.2	9
Never	45.5	30	83.3	10	75.0	24	58.2	64
Total	100.0	66	100.0	12	100.0	32	100.0	110

More Sunsari providers who always recap are likely to give more injections (Median of 70) per week than those who never recap (Median of 50 per week). This puts them at an even greater risk of needle sticks, since they are handling more needles more times (not just when they open them, inject and dispose, but also during recapping).

Table 2.8 Distribution of Sangini outlets by number of injections given in a week in Sunsari district, by frequency of recapping.

Number of injections given in during an average week in Sunsari district	Frequency of recapping after injection					
	Always N=33		Sometimes N=3		Never N=30	
	%	N	%	N	%	N
Less than 20	18.2	6	-	-	13.3	4
20-39	12.1	4	33.3	1	16.7	5
40-59	15.2	5	33.3	1	23.3	7
60-80	18.2	6	-	-	6.7	2
81-105	18.2	6	-	-	16.7	5
106+	18.2	6	33.3	1	23.3	7
Mean	76.0		91.7		91.0	
Median	70.0		40.0		50.0	
Range	1-250		35-200		10-350	

2.3 Loose used syringes/needles

Observations of loose needles and/or syringes were made by the data collection team. The team found that in the majority of the outlets (87%), there were no used sharps in an open container (other than a safety box) or loosely disposed (improperly disposed) inside the health outlets (Table 2.9). It was only in Sunsari district (21%; n=14) where the field team noted loosely disposed sharp objects, such as medicine bottles, broken glass, knives, blades and scissors, outside the safety boxes; the number of such pieces was less than 25 in 2 outlets, between 25 and 50 in about 6 outlets and more than 50 pieces in 6 other outlets (Data not shown). However, no loose needles or syringes were observed lying around inside these or any other outlets.

Table 2.9 Distribution of Sangini outlets by presence of used sharps in an open container (other than a safety box) or otherwise loose inside the health outlet

Presence of used sharps in an open containers or loose inside outlet	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Yes – any sharps	21.2	14	-	-	-	-	12.7	14
No	78.5	52	100.0	12	100.0	32	87.3	96
Needles/syringes – No	100%	66	100%	12	100%	32	100%	110
Total	100.0	66	100.0	12	100.0	32	100.0	110

Further, the team also looked immediately outside the outlets and did not find any evidence of needles or any other sharp items outside any outlet they visited (Table 2.10).

Table 2.10 Distribution of Sangini outlets by presence of used sharps in an open container or otherwise loose (improperly disposed of) immediately outside the outlet

Are there any used sharps in an open container or otherwise loose (improperly disposed of) immediately outside the outlet?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Yes	-	-	-	-	-	-	-	-
No	100.0	66	100.0	12	100.0	32	100.0	110
Cannot be assessed	-	-	-	-	-	-	-	-
Total	100.0	66	100.0	12	100.0	32	100.0	110

Chapter 3: Sharps waste management and safety boxes

This chapter deals with sharps waste generation, segregation, management and disposal at Sangini outlets.

3.1 Sharps waste generation, segregation and storage

When asked about how many safety boxes are usually filled in a week, nearly half (46%; n=50) of the outlets reported that less than one box was filled in a week. (Only one outlet said none.) One-in-five outlets (more than half in Mugu) reported one per week. The median was .25 safety boxes in Sunsari, 1.0 in Mugu and 3 in Syangja. (Table 3.1)

Table 3.1 Distribution of Sangini outlets by number of safety boxes used/filled in a week

About how many safety boxes are used/filled in one week? (in number)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
None	1.5	1	0	0	0	0	0.9	1
Less than 1 box	75.8	50	8.3	1	-	-	45.5	50
1	22.7	15	58.3	7	-	-	20.0	22
2	1.5	1	25.0	3	18.8	6	9.1	10
3	-	-	8.3	1	34.4	11	10.9	12
4+ (4-10)	-	-	-	-	46.9	15	13.6	15
Mean	0.45		1.37		4.63		1.78	
Median	0.25		1.00		3.00		1.00	
Min	.050		.500		2.00		.50	
Max	2		3.00		10.00		10.00	
Total	100.0	66	100.0	12	100.0	32	100.0	110

Based on observations, about three-fourths of the outlets -72% in Syangja, 74% in Sunsari, and 92% in Mugu - had separated the sharps waste from other waste. Nearly two-thirds (64%), only 53% in Sunsari, kept sharps wastes in safety boxes. About one-fifth kept them in boxes/cartons without plastic bags. Over 10% had kept them in bins without plastic bags and another 5% did so in bins with plastic bags. A total of 6% of outlets used plastic bags in either bins or boxes. (Table 3.2).

Table 3.2 Distribution of Sangini outlets by waste segregation and place where sharps waste is put

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Is this kind of waste (SHARPS) separate from other waste?								
Yes	74.2	49	91.7	11	71.9	23	75.5	83
No	25.8	17	8.3	1	21.9	7	22.7	25
Do not know/none visible	-	-	-	-	6.3	2	1.8	2
Total	100.0	66	100.0	12	100.0	32	100.0	110
Where is this type (SHARPS) of waste kept?								
Safety box	53.0	35	75.0	9	83.3	25	63.9	69
Bin with plastic bag	4.5	3	8.3	1	3.3	1	4.6	5

Bin without plastic bag	16.7	11	-	-	3.3	1	11.1	12
Box/Carton with plastic bag	1.5	1	-	-	-	-	0.9	1
Box/Carton without plastic bag	24.2	16	16.7	2	10.0	3	19.4	21
Total	100.0	66	100.0	12	100.0	30	100.0	108

Regarding the colors of the safety boxes/bins, the data collection teams observed that over 3-in-4 of the outlets had red color safety boxes/bins. In Sunsari and Syangja, 84-85% of outlets had red safety boxes/bins, compared to Mugu where only 20% were red. In Mugu, 70% were white, paper box (carton), reportedly provided by Gaon Ghar Clinics (Outreach Clinics), compared to only 11% in Syangja and 4% in Sunsari. In each district between 10 and 15% used blue or green color safety boxes/bins. Three of the outlets (4%), all in Sunsari, had black safety boxes/bins in their outlets (Table 3.3).

Table 3.3 Distribution of Sangini outlets by color of safety boxes/other containers and plastic bags used to keep sharps waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Color of safety boxes/ bins (SHARPS) (Multiple Response)								
Red	83.7	41	20.0	2	85.2	23	76.7	66
White	4.1	2	70.0	7	11.1	3	14.0	12
Blue or green	10.2	5	10.0	1	14.8	4	11.6	10
Black	6.1	3	-	-	-	-	3.5	3
Yellow	2.0	1	-	-	3.7	1	2.3	2
Other (bucket; tin box)	-	-	-	-	7.4	2	2.3	2
Total	100.0	49	100.0	10	100.0	27	100.0	86
Color of plastic bags (SHARPS) (Multiple Response)								
White	4.5	3	16.7	2	3.3	1	5.6	6
Black	3.0	2	-	-	3.3	1	2.8	3
Green	1.5	1	8.3	1	-	-	1.9	2
Other (cartoon; bucket)	1.5	1	-	-	-	-	0.9	1
None	90.9	60	75.0	9	93.3	28	89.8	97
Total	-	66	-	12	-	30	-	108

The six percent of outlets using plastic bags for sharps waste containers (Table 3.2) all used white bags. Some of these outlets also used black or green bags.

None of the outlets in Mugu and only one outlet in Syangja had waste containers (safety boxes/bins/bags) with sharps in common areas. In more than half (59%) of Sunsari outlets, the sharps containers in common areas were in good condition with waste well inside the container; at 20% of Sunsari outlets, some were orderly and some not and at the other 20% all the sharps containers had contents either spilling over or sticking out. (Table 3.4)

Based on data collector observation, in the majority of the outlets (96%) all full containers of sharps were kept in an area away from public access. Only in Sunsari district it was observed that four of the 66 (6% of) outlets kept full sharps containers in public areas.

Table 3.4 Distribution of Sangini outlets by condition of containers (safety boxes/bins/bags) with sharps waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is condition of safety boxes/bins/bags in common areas (SHARPS)?								
All are orderly with everything contained inside them	59.1	39	-	-	3.3	1	37.0	40
Some are orderly with everything contained and some are not	19.7	13	-	-	-	-	12.0	13
None are orderly; all have things spilling over, sticking out and/or on the floor around them	21.2	14	-	-	-	-	13.0	14
Cannot be assessed	-	-	100.0	12	96.7	29	38.0	41
Total	100.0	66	100.0	12	100.0	30	100.0	108
Where are full safety boxes/bins/bags kept (SHARPS)?								
All are in an area away from public access	93.9	62	100.0	12	100.0	30	96.3	104
Some are in an area away from public access and some are not	-	-	-	-	-	-	-	-
All are in public area	6.1	4	-	-	-	-	3.7	4
No full containers/Cannot be assessed	-	-	-	-	-	-	-	-
Total	100.0	66	100.0	12	100.0	30	100.0	108
What is the condition of the full containers (SHARPS)?								
All are closed	54.5	36	58.3	7	76.7	23	61.1	66
Some are closed, but others are not	-	-	-	-	6.7	2	1.9	2
None are closed	45.5	30	41.7	5	10.0	3	35.2	38
No full safety boxes seen/ cannot be assessed	-	-	-	-	6.7	2	1.9	2
Total	100.0	66	100.0	12	100.0	30	100.0	108

Regarding the condition of the full sharps containers, in about three-fifths of the outlets the team observed that all were closed, but in more than a third of the outlets (35%, only 10% in Syangja), no sharps containers were found closed. There were two outlets where some were closed and some were not. In another two outlets (both in Syangja), the team could not assess the condition of the safety boxes as they were not able to be seen. (Table 3.4)

Respondents were also asked where full safety boxes were stored until they were removed from the outlets. The results are given in Table 3.5 Almost all the outlets (90%) reported keeping the full safety boxes in the injection rooms until they were removed from the outlets. This is almost the same across the districts surveyed. About 6% of the outlets mentioned that they store the full safety boxes in another room and 4% (all in Sunsari) mentioned that they store it elsewhere, including outside the room, in front of the shop or they did not use safety waste boxes.

Table 3.5 Distribution of Sangini outlets by place the full safety boxes kept until they're removed from the outlet

Where are the full safety boxes kept until they're removed from the outlet?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
In another room	4.5	3	-	-	12.5	4	6.4	7
Somewhere else in the injection room	89.4	59	100.0	12	87.5	28	90.0	99
Elsewhere (have not used safety box; outside the room; in front of shop)	6.1	4	-	-	-	-	3.6	4
Total	100.0	66	100.0	12	100.0	32	100.0	110

3.2 Sharps waste disposal

In the visited Sangini outlets, the field team looked around the outlet for an incinerator which is the most effective means of disposing of sharps waste. In a little more than half of the outlets (51%) visited, there were tin boxes (used as incinerators); nearly two-thirds of the outlets in Syangja and over half in Sunsari had tin box incinerators while in Mugu none did. None had actual incinerators. (Table 3.6)

Table 3.6 Distribution of Sangini outlets by presence of tin boxes (an incinerator)

Is there an incinerator (tin box) (observed)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Yes	53.0	35	-	-	65.6	21	50.9	56
No	47.0	31	100.0	12	34.4	11	49.1	54
Total	100.0	66	100.0	12	100.0	32	100.0	110

Many providers mentioned more than one method used for final disposal of sharps, indicating no standard practice for final sharps disposal. (See Table 3.7) About half (51%) mentioned that they burn sharps waste on the open ground and nearly 30% mentioned that they burn sharps waste in a pit or in an enclosure. About 30% also reported burying sharps waste materials. There were about 13% (in Sunsari and Syangja) who mentioned that they dispose sharps waste materials through municipality vehicle. By district, a higher percentage of outlets in Sunsari district (62%) reported burning sharps on open ground than Mugu (42%) and Syangja district (31%), while a lower percentage (17%) in Sunsari burned in a pit or enclosure than the other districts (47-50%). However, Sunsari also had the highest percentage (20%) of outlets mentioning that the municipality/VDC collects it. This could be dangerous for those waste handlers and, depending on how and where it is eventually disposed, for the general public.

In terms of frequency of disposing of sharps waste, 87% of providers (92% in Mugu) said it was after more than a week. Having sharps waste around in outlets this long, especially if not using self-contained safety boxes, increases the risk of contact for providers and clients with used needles and syringes. By district, 22% in providers in Syangja claimed to dispose of sharps waste more frequently than once a week, compared to 8-9% in the other two districts.

Table 3.7 Distribution of Sangini outlets by methods of sharps waste disposal

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is/are the main health care waste disposal method(s) used in this outlet to dispose of SHARPS WASTE? (Multiple Response)								
Open burning on the ground	62.1	41	41.7	5	31.3	10	50.9	56
Open burning in a pit or in an enclosure	16.7	11	50.0	6	46.9	15	29.1	32
Low temperature incineration / burning (Single-chamber, “Drum” , brick)	-	-	-	-	3.1	1	0.9	1
Burial	36.4	24	33.3	4	12.5	4	29.1	32
Dumping in a protected (secure) pit (including a needle pit)	19.7	13	-	-	-	-	11.8	13
Municipality/VDC	19.7	13	-	-	3.1	1	12.7	14
Other (waste not generated)	-	-	-	-	3.1	1	0.9	1
Total	-	66	-	12	-	32	-	110
Overall, how often does this type of waste (SHARPS) leave the outlet?								
Several times a day	-	-	-	-	-	-	-	-
Once a day	3.0	2	-	-	9.4	3	4.5	5
Several times a week	6.1	4	8.3	1	12.5	4	8.2	9
Once a week	22.7	15	-	-	12.5	4	17.3	19
After more than a week	68.2	45	91.7	11	65.6	21	70.0	77
Total	100.0	66	100.0	12	100.0	32	100.0	110

3.3 Safety boxes – types, availability, condition, handling of contents

Regarding the types of safety boxes used at the Sangini outlets, in Mugu and Syangja half or more of providers said they used both disposable and non-disposable, with equal numbers using only one or the other. In Sunsari, 73% said they used non-disposable and 24% disposable (Table 3.8).

Table 3.8 Distribution of Sangini outlets by types of safety boxes used

What type of safety boxes do you use?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Disposable	24.2	16	16.7	2	21.9	7	22.7	25
Non-disposable	72.7	48	16.7	2	25.0	8	52.7	58
Both	3.0	2	66.7	8	53.1	17	24.5	27
Total	100.0	66	100.0	12	100.0	32	100.0	110

The survey team found 11 outlets where there were more than one area or room where injections were given – ten (six in Sunsari and four in Syangja) had two and one (Sunsari) had four different places. Safety boxes are leak and puncture proof containers that should be kept in each injection area. The number of safety boxes for each place and the condition of the boxes were observed. The results are presented in Tables 3.9 to 3.11.

More than a third of the outlets (35%, 44% in Sunsari) did not have any safety boxes. About half the outlets had one safety box and nearly 14% having two safety boxes, in injection area 1. There were 11 outlets that had more than one injection areas/rooms. Very few (one-fourth) of these 11 outlets had a safety box specifically in area 2. (Table 3.9). This could mean that providers in the other outlets are carrying the used needles from one area to another for disposal, which could be dangerous for them; safety boxes are supposed to be right next to an injection site to minimize the risk of needle sticks.

Outlets with at least one safety box visible had an average of 1.25 visible, ranging from 1 per outlet in Mugu to 1.3 in Sunsari and Syangja outlets.

Table 3.9 Distribution of Sangini outlets by availability of number of safety boxes in injection areas or places in the outlet

How many safety boxes (puncture-proof and leak-proof sharps containers) are there in each injection area?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
<i>% of outlets with no safety boxes</i>	43.9	29	25.0	3	18.8	6	34.5	38
Areas/room 1								
0	43.9	29	25.0	3	18.8	6	34.5	38
1	42.4	28	75.0	9	62.5	20	51.8	57
2	13.6	9	-	-	18.8	6	13.6	15
Total	100.0	66	100.0	12	100.0	32	100.0	110
Areas/room 2:								
0	71.4	5	-	-	75.0	3	72.7	8
1	26.6	2	-	-	25.0	1	27.3	3
2	-	-	-	-	-	-	-	-
Total	100.0	7	-	-	100.0	4	100.0	11
Net safety boxes by facility								
0	43.9	29	25.0	3	18.8	6	34.5	38
1	39.4	26	-	-	62.5	20	41.8	46
2	15.2	10	8.3	1	15.6	5	14.5	16
3	1.5	1	66.7	8	3.1	1	9.1	10
Total	100.0	66	100.0	12	100.0	32	100.0	110
Average number of boxes in facilities with at least one.	1.3		1.0		1.27		1.25	

The condition of safety boxes in terms of overfilling was assessed in the outlets by the data collectors by observation for each injection area. The results are given in Table 3.10. Of the 72 outlets with at least one safety box, seven percent (none in Mugu) were seen to be overfilled or had needles, syringes or other things sticking out.

Table 3.10 Distribution of Sangini outlets by number of filled safety boxes in injection areas or places in the outlet and in whole outlet

By area and in whole outlet, how many of the safety boxes are NOT filled above the mark NOR have needles/ syringes sticking out?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
<i>% of outlets with NO safety boxes overfilled or sticking out</i>	89.2	33	100.0	100.0	96.2	25	93.1	67
<i>% of outlets with some/all safety boxes overfilled or sticking out</i>	10.8	4		-	3.8	1	6.9	5
Total	100.0	37	100.0	9	100.0	26	100.0	72
Areas/room 1:								
0	10.8	4	-	-	3.8	1	6.9	5
1	62.2	23	100.0	9	76.9	20	72.2	52
2	21.6	8	-	-	19.2	5	18.1	13
3	5.4	2	-	-	-	-	2.8	2
Total	100.0	37	100.0	9	100.0	26	100.0	72
Areas/room 2:								
0	50.0	1	-	-	100.0	1	66.7	2
1	50.0	1	-	-	-	-	33.3	2
Total	100.0	2			100.0	1	100.0	3

Providers were also asked about how full safety boxes were when removed from injection area(s). Over one-third of providers (37%) reported that they remove safety boxes when they are filled to the top; by district this figure was 50% in Sunsari, 22% in Syangja and 8% in Mugu. Generally, it is recommended not to fill over the mark before removing them, to reduce chances of needles sticking through or coming out. In about one-tenth of the outlets they reported it was when the waste reached the mark level. In over two-fifths of the outlets, the safety boxes were removed when 3/4th full according to the providers (Table 3.11).

Table 3.11 Distribution of Sangini outlets by fullness of safety boxes when removed from injection areas

How full are safety boxes when removed from injection areas?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
To top	50.0	33	8.3	1	21.9	7	37.3	41
To mark	7.6	5	41.7	5	6.3	2	10.9	12
3/4 th full	30.3	20	50.0	6	59.4	19	40.9	45
2/3 rd full	9.1	6	-	-	6.3	2	7.3	8
Others§	3.0	2	-	-	6.3	2	3.6	4
Total	100.0	66	100.0	12	100.0	32	100.0	110

Note: § Other includes: have not used safety box; less than half; burn them each day.

During the survey it was observed whether the safety boxes' holes/tops were covered or not for each injection area in the outlets. Of the 72 outlets having at least one safety box, almost all (>90%) of the outlets in Sunsari and Syangja had no safety boxes that had holes/tops covered, whereas in Mugu, the situation was the opposite – only 11% of outlets had no safety boxes covered. Covered safety boxes should be the norm, as it's more likely for people, including the provider, to come in contact with used needles when the boxes are not closed. (Table 3.12).

Table 3.12 Distribution of Sangini outlets by number safety boxes with holes/tops covered in injection areas or places in the outlet

By area, how many safety boxes have the hole/top covered?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
<i>% of outlets with NO safety boxes covered</i>	91.9	34	11.1	1	96.2	25	83.3	60
<i>% of outlets with some/all safety boxes covered</i>	8.1	3	88.9	8	3.8	1	16.7	12
Total	100.0	37	100.0	9	100.0	26	100.0	72
Areas/room 1:								
0	91.9	34	11.1	1	96.2	25	83.3	60
1	5.4	2	11.1	1	3.8	1	5.6	4
2	2.7	1	77.8	7	-	-	11.1	8
Total	100.0	37	100.0	9	100.0	26	100.0	72
Areas/room 2:								
0	100.0	2	-	-	100.0	1	100.0	3
Total	100.0	2			100.0	1	100.0	3
Top covered								
0	48.5	32	50.0	6	28.1	9	42.7	47
1	34.8	23	50.0	6	56.3	18	42.7	47
2	13.6	9		-	12.5	4	11.8	13
3	3.0	2		-	3.1	1	2.7	3
Total	100.0	66	100.0	12	100.0	32	100.0	110

There was also a question to providers as to what was done to cover the hole on the top of the safety boxes (this question referred to the white carton boxes with a hole to insert sharps). All outlets, except one in Syangja, reported that they do nothing to cover the hole on top of the safety boxes (Table 3.13).

Table 3.13 Distribution of Sangini outlets by what is done to cover the hole on the top of the safety boxes

What is done to cover the hole on the top of the safety boxes?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Nothing	100.0	66	100.0	12	96.9	31	99.1	109
Cover with lid	-	-	-	-	3.1	1	0.9	1
Total	100.0	66	100.0	12	100.0	32	100.0	110

Half of the providers said their outlet had stock-outs of safety boxes at some time in the last six months; however in Mugu, it was two-thirds (Table 3.14). This is lower than the number of outlets observed with no safety boxes during the visit (35% - Table 3.9); therefore about 15% of outlets had stock outs at some point, but did have a safety box(es) at the time of the visit.

Table 3.14 Distribution of Sangini outlets by availability of safety boxes at any time in the last six months

In the last 6 months, has this outlet been out of stock of safety boxes at any time?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Yes	48.5	32	66.7	8	50.0	16	50.9	56
No	51.5	34	33.3	4	46.9	15	48.2	53
Do not know/do not remember	-	-	-	-	3.1	1	0.9	1
Total	100.0	66	100.0	12	100.0	32	100.0	110

Just over one-third of all outlets – more than 50% of Mugu outlets - reported that they were without safety boxes frequently or sometimes. (Table 3.15)

Table 3.15 Distribution of Sangini outlets by frequency of safety boxes unavailable at the outlet

How often is this outlet without safety boxes?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Frequently	16.7	11	16.7	2	25.0	8	19.1	21
Sometimes	6.1	4	41.7	5	28.1	9	16.4	18
Rarely	1.5	1	-	-	9.4	3	3.6	4
Never	74.2	49	41.7	5	37.5	12	60.0	66
Do not know	1.5	1	-	-	-	-	0.9	1
Total	100.0	66	100.0	12	100.0	32	100.0	110

What did respondents do with sharps waste when they were out of safety boxes? In Sunsari, 79% said they keep the sharps wastes in a bin or box without plastic bags. In Mugu, 75% said they keep the sharps waste in boxes (33% with plastic bag and 42% without). And in Syangja, 66% said they keep sharps waste in a bin with a plastic bag (Table 3.16).

Table 3.16 Distribution of Sangini outlets by place for keeping sharps waste when safety boxes are out of stock

Where was the sharps waste put when the outlet was out of stock of safety boxes?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Bin with plastic bag	1.5	1	16.7	2	65.6	21	21.8	24
Bin without plastic bag	33.3	22	8.3	1	9.4	3	23.6	26
Box/Carton with plastic bag	3.0	2	33.3	4	3.1	1	6.4	7
Box/Carton without plastic bag-	45.5	30	41.7	5	12.5	4	35.5	39
Plastic bag only	-	-	-	-	3.1	1	0.9	1
Buried in safety pit; burned in specific place, river	10.6	7	-	-	-	-	6.4	7
Other (throw elsewhere)	3.0	2	-	-	-	-	1.8	2
Have not experienced such problem	3.0	2	-	-	6.3	2	3.6	4
Total	100.0	66	100.0	12	100.0	32	100.0	110

When asked how often the needles and syringes are emptied out of the safety boxes, a little more than two-fifths of the respondents said that it happened often, another 32% said sometimes while another 23% said that these were rare cases. Four outlets said that it never occurred to them. The proportion of respondents mentioning “often” was higher (52%) in Sunsari than in Syangja (34%) and Mugu (8%). (Table 3.17)

Table 3.17 Distribution of Sangini outlets by frequency of needles and syringes that are emptied out of the safety boxes

How often does it happen that needles and syringes are emptied out of the safety boxes?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Often	51.5	34	8.3	1	34.4	11	41.8	46
Sometimes	28.8	19	41.7	5	34.4	11	31.8	35
Rarely	16.7	11	50.0	6	25.0	8	22.7	25
Never	3.0	2	-	-	6.3	2	3.6	4
Total	100.0	66	100.0	12	100.0	32	100.0	110

Providers were asked what is done with the **needles** emptied from the safety boxes. The great majority (84%) mentioned that they burned these. (Table 3.18). The rest said that the emptied wastes were either put with general waste, put with infectious waste, buried in the pit, or put in the municipal waste management vehicle. One outlet in Syangja mentioned that they threw it out of the shop. Regarding the **syringes** emptied from the safety boxes, the respondents gave similar answers. Those who burned syringes were 86%, followed by putting with infectious waste (6%), sending through municipal vehicle (5%), putting with general waste (2%) and burying (2%).

Table 3.18 Distribution of Sangini outlets by what was done with the needles and syringes emptied from safety boxes

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is done with the needles emptied from the safety boxes?								
Burned	79.7	51	91.7	11	90.0	27	84.0	89
Put in general waste	3.1	2	-	-	-	-	1.9	2
Put in infectious waste	9.4	6	-	-	-	-	5.7	6
Buried	1.6	1	8.3	1	6.7	2	3.8	4
Send through Municipality vehicle,	6.3	4	-	-	-	-	3.8	4
Other (throw away from shop)	-	-	-	-	3.3	1	0.9	1
Total	100.0	64	100.0	12	100.0	30	100.0	106
What is done with the syringes emptied from the safety boxes?								
Burned	78.8	52	100.0	12	93.8	30	85.5	94
Put in general waste	3.0	2	-	-	-	-	1.8	2
Put in infectious waste	10.6	7	-	-	-	-	6.4	7
Buried	-	-	-	-	6.3	2	1.8	2
Send through Municipality vehicle	7.6	5	-	-	-	-	4.5	5
Total	100.0	66	100.0	12	100.0	32	100.0	110

Chapter 4: Management of non-sharps infectious (NSI) and general waste

This chapter deals with waste segregation, management and disposal of non-sharps infectious waste and general waste at Sangini outlets, including presence and condition of waste found outside outlets.

4.1 Non-sharps infectious waste generation, segregation, storage and disposal

Providers were asked to estimate the amount of waste generated in the outlets in terms of bins, standardized to the red plastic bucket provided by CRS. In two-fifths of the outlets, the providers reported that they generated one bin of non-sharps infectious waste in a week. The providers in 21% outlets said that they generated two bins followed by 14% providers who mentioned generating three bins a week. In about 22 outlets, the respondents gave the amount of waste generated in terms of number of buckets, boxes or cartons making it difficult to establish equivalent number of standard CRS bins. However, by district, the estimated weekly median number of bins of non-sharps infectious waste generated was 2 in Sunsari, .5 in Mugu, and 1 in Syangja. (Table 4.1).

Table 4.1 Distribution of Sangini outlets by amount of non-sharps infectious waste generated (number of bins in a week)

Amount of non-sharps infectious waste generated in a week	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
1	40.9	27	25.0	3	43.8	14	40.0	44
2	31.8	21	8.3	1	3.1	1	20.9	23
3	16.7	11	-	-	12.5	4	13.6	15
4+	9.1	6	-	-	-	-	5.4	6
Half bucket; less than half bucket one third of the bucket	-	-	-	-	31.3	10	9.1	10
One box in two weeks; one carton in two weeks	-	-	41.7	5	6.3	2	6.4	7
One bucket in a month; one carton in a month	-	-	16.7	2	3.1	1	2.7	3
Mean	2.03		0.73		1.04		1.60	
Median	2.00		0.50		1.00		1.00	
Range	1.00- 7.00		0.25- 2.00		0.25- 3.00		0.25- 7.00	
Other: Four boxes of both all types of wastes in a week; 1 carton in a month	1.5	1	8.3	1	-	-	1.8	2
Total	100.0	66	100.0	12	100.0	32	100.0	110

Overall, over half (56%) of the outlets were observed to have separated the non-sharps infectious waste from sharps and general waste (Table 4.2). This figure was much higher (75%) in Mugu and Sunsari (65%) than in Syangja (28%). Only about one-tenth of the outlets kept non-sharps infectious wastes in safety boxes while over three-fifths -100% in Mugu- kept them in boxes/cartons without plastic bags. Nearly one-fifth had kept them in bins without plastic bags.

Table 4.2 Distribution of Sangini outlets by waste segregation and place where non-sharps infectious waste is kept

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Is this kind of waste (NON-SHARPS INFECTIOUS) separate from other waste?								
Yes	65.2	43	75.0	9	28.1	9	55.5	61
No	34.8	23	25.0	3	59.4	19	40.9	45
Do not know/none visible	-	-	-	-	12.5	4	3.6	4
Total	100.0	66	100.0	12	100.0	32	100.0	110
Where is this type (NON-SHARPS INFECTIOUS) of waste kept?								
Safety box	7.6	5	-	-	25.0	7	11.3	12
Bin with plastic bag	1.5	1	-	-	10.7	3	3.8	4
Bin without plastic bag	21.2	14	-	-	17.9	5	17.9	19
Box/Carton with plastic bag	3.0	2	-	-	3.6	1	2.8	3
Box/Carton without plastic bag	65.2	43	100.0	12	42.9	12	63.2	67
Plastic bag only	1.5	1	-	-	-	-	0.9	1
Total	100.0	66	100.0	12	100.0	28	100.0	106

Over half (54%) of the outlets using safety boxes or bins for non-sharps infectious waste had blue or green containers, followed by about one-third (31%) in red containers. Very few (6%) of the outlets (none in Mugu) used a plastic bags to keep non-sharps infectious waste. (Table 4.3).

Table 4.3 Distribution of Sangini outlets by color of safety boxes and bins (among those who had safety boxes/bins) and plastic bags used to keep non-sharps infectious waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Color of safety boxes/ bins (NON-SHARPS INFECTIOUS) (Multiple Response)								
Red	20.0	4	-	-	46.7	7	31.4	11
Black	10.0	2	-	-	6.7	1	8.6	3
Blue or green	65.0	13	-	-	40.0	6	54.3	19
Other (bucket; tin box)	5.0	1	-	-	6.7	1	5.7	2
Total	-	20	-	-	-	15	-	35
Color of plastic bags (NON-SHARPS INFECTIOUS) (Multiple Response)								
White	1.5	1	-	-	3.6	1	1.9	2
Green	1.5	1	-	-	3.6	1	1.9	2
Black	-	-	-	-	3.6	1	0.9	1
Other (cartoon; bucket)	3.0	2	-	-	-	-	1.9	2
None	95.5	63	100.0	12	89.3	25	94.3	100
Total	-	66	-	12	-	28	-	106

The providers were also asked specifically about where they dispose infectious waste items such as cotton, gauze, etc. that were used to apply pressure at the injection site after giving an injection. The results are given in Table 4.4. More than two-thirds of the outlets reported putting these items in a separate container meant for keeping infectious waste; this was higher in Sunsari and Mugu than in Syangja. In Syangja, 53% said these infectious items were put in the general waste, which can result in transmission of disease to people coming in contact with general waste. Only a few (7 of 110 outlets) reported that they put them in the safety boxes.

Table 4.4 Distribution of Sangini outlets by what providers say they do with used (non-sharps) infectious waste

Where do you put items such as cotton used to apply pressure to patients' skin after injection?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Safety box	4.5	3	-	-	12.5	4	6.4	7
Separate container for infectious waste	83.3	55	75.0	9	34.4	11	68.2	75
General waste	12.1	8	25.0	3	53.1	17	25.5	28
Total	100.0	66	100.0	12	100.0	32	100.0	110

As with sharps waste containers, only outlets from Sunsari had containers with non-sharps infectious (NSI) waste in common areas, with about half with all visible NSI waste containers orderly. The rest of Sunsari's outlets were almost equally split between those with some of the NSI waste containers being orderly (and some not) and those with none being orderly. (Table 4.5). The vast majority (91%, 75% in Mugu) of outlets kept all full NSI containers away from public access. Five outlets (all in Sunsari) kept all NSI containers in a public area. With regards to the condition of the NSI containers, none of the full boxes were closed in about three-fourths of the outlets, with none closed in Mugu, 42% all open in Syangja, and 77% all open in Sunsari. All or some of the full safety boxes were closed in about one-fifth of the outlets.

Table 4.5 Distribution of Sangini outlets by condition of containers (safety boxes/bins/bags) containing non-sharps infectious waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is condition of safety boxes/bins/bags in common areas (NON-SHARPS infectious)?								
All are orderly with everything contained inside them	48.5	32	-	-	-	-	30.2	32
Some are orderly with everything contained and some are not	28.8	19	-	-	3.6	1	18.9	20
None are orderly; all have things spilling over, sticking out and/or on the floor around them	22.7	15	-	-	3.6	1	15.1	16
Cannot be assessed	-	-	100.0	12	92.9	26	35.8	38
Total	100.0	66	100.0	12	100.0	28	100.0	106
Where are full safety boxes/bins/bags kept (NON-SHARPS infectious)?								
All are in an area away from public access	89.4	59	75.0	9	100.0	28	90.6	96
Some are in an area away from public access and some are not	3.0	2	25.0	3	-	-	4.7	5
All are in public area	7.6	5	-	-	-	-	4.7	5
No full containers/Cannot be assessed	-	-	-	-	-	-	-	-
Total	100.0	66	100.0	12	100.0	28	100.0	106
What is the condition of the full containers (NON-SHARPS infectious)?								
All are closed	9.1	6	-	-	28.6	8	13.2	14
Some are closed, but others are not	13.6	9	-	-	7.1	2	10.4	11
None are closed	77.3	51	100.0	12	53.6	15	73.6	78
No full containers seen/ cannot be assessed	-	-	-	-	10.7	3	2.8	3
Total	100.0	66	100.0	12	100.0	28	100.0	106

In terms of final disposal, about 43% of the surveyed outlets mentioned that they burned the non-sharps infectious waste in the open ground and 22% said they burned them in a pit or in an enclosure. All the providers in Mugu claimed to burn them one way or the other. One-third of all respondents (41% in Sunsari and 28% in Syangja (none in Mugu) mentioned that they dispose of non-sharps infectious waste materials through municipality vehicles, which could be dangerous to these waste handlers. Depending on where it is disposed, it could also be dangerous to the general public (Table 4.6). Very few (3%) mentioned that they buried non-sharps infectious waste materials.

In terms of frequency of disposal, over one-third (38%) of outlets (only in Sunsari and Syangja) said non-sharps infectious waste leaves the outlet at least once a day. In Mugu, 83% said it left the outlet once a week or less often.

Table 4.6 Distribution of Sangini outlets by methods of non-sharps infectious waste disposal

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is/are the main health care waste disposal method(s) used in this outlet to dispose of NON-SHARPS INFECTIOUS waste? (Multiple Response)								
Open burning on the ground	45.5	30	50.0	6	34.4	11	42.7	47
Open burning in a pit or in an enclosure	13.6	9	50.0	6	28.1	9	21.8	24
Burial	1.5	1	-	-	6.3	2	2.7	3
Municipality/VDC	40.9	27	-	-	28.1	9	32.7	36
Private waste company	1.5	1	-	-	-	-	0.9	1
Other (waste not generated)	-	-	-	-	3.1	1	0.9	1
Total	-	66	-	12	-	32	-	110
Overall, how often does this type of waste (non-sharps INFECTIOUS) leave the outlet?								
Several times a day	3.0	2	-	-	-	-	1.8	2
Once a day	43.9	29	-	-	34.4	11	36.4	40
Several times a week	19.7	13	16.7	2	50.0	16	28.2	31
Once a week	28.8	19	41.7	5	9.4	3	24.5	27
After more than a week	4.5	3	41.7	5	6.3	2	9.1	10
Total	100.0	66	100.0	12	100.0	32	100.0	110

4.2 General waste generation, segregation, storage and disposal

Regarding quantity of general waste generated per week, nearly half (45%) of the respondents reported (standardized to the red plastic bucket supplied by CRS) generating 1-2 bins, followed by one-third (32%) reporting 3-4 bins. Nearly one-fifth of the respondents said that they generate 5 or more bins in a week (Table 4.3). By district, Sunsari and Syangja reported a median of three bins of general waste generated weekly, compared to 1 in Mugu (Table 4.7).

Table 4.7 Distribution of Sangini outlets by amount of general waste generated in a week

About how many bins of general waste are generated in a week? (number of bins)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
1	19.7	13	33.3	4	18.8	6	20.9	23
2	24.2	16	25.0	3	25.0	8	24.5	27
3	22.7	15	-	-	21.9	7	20.0	22
4	15.2	10	-	-	9.4	3	11.8	13
5+	16.7	11	-	-	25.0	8	17.3	19
One box in two weeks; one carton in two weeks	-	-	33.3	4	-	-	3.6	4
Mean	3.09		1.09		3.28		2.94	
Median	3.00		1.00		3.00		2.50	
Range	1.00-10.00		0.50-2.00		1.00-7.00		0.50-10.00	
Other: 4 boxes of both all types of wastes in a week; 2 cartons in a week.	1.5	1	8.3	1	-	-	1.8	2
Total	100.0	66	100.0	12	100.0	32	100.0	110

As with NSI waste, the data collection teams observed that nearly three-fifths (59%) of all outlets kept general waste separately from other wastes. This figure was higher (75%) in Mugu and Sunsari (65%) than in Syangja (41%). Four-fifths of the outlets kept general waste in boxes/cartons without plastic bag and another one-tenth kept general waste in bins without plastic bags. None of the outlets had kept general waste in safety boxes (Table 4.8).

Table 4.8 Distribution of Sangini outlets by waste segregation and where general waste is kept

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Is this kind of waste (GENERAL WASTE) separate from other waste?								
Yes	65.2	43	75.0	9	40.6	13	59.1	65
No	34.8	23	25.0	3	59.4	19	40.9	45
Total	100.0	66	100.0	12	100.0	32	100.0	110
Where is this type (GENERAL WASTE) of waste kept?								
Safety box	-	-	-	-	-	-	-	-
Bin with plastic bag	1.5	1	-	-	3.1	1	1.8	2
Bin without plastic bag	16.7	11	-	-	9.4	3	12.7	14
Box/Carton with plastic bag	6.1	4	-	-	3.1	1	4.5	5
Box/Carton without plastic bag	74.2	49	100.0	12	84.4	27	80.0	88
Plastic bag only	1.5	1	-	-	-	-	0.9	1
Total	100.0	66	100.0	12	100.0	32	100.0	110

Most of the 12 outlets (67%) in Sunsari which kept general waste in bins, used blue or green bins. The vast majority (96%) of the outlets did not use plastic bags in the general waste containers (Table 4.9).

Table 4.9 Distribution of Sangini outlets by color of containers used to keep general waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Color of containers (GENERAL WASTE) (Multiple Response)								
Red	8.3	1	-	-	50.0	2	18.8	3
Black	16.7	2	-	-	25.0	1	18.8	3
Blue or green	66.7	8	-	-	25.0	1	56.3	9
Other (bucket; tin box)	8.3	1	-	-	-	-	6.3	1
Total	-	12	-	-	-	4	-	16
Color of plastic bags (GENERAL WASTE) (Multiple Response)								
White	1.5	1	-	-	-	-	0.9	1
Green	1.5	1	-	-	3.1	1	1.8	2
Other (cartoon; bucket)	3.0	2	-	-	-	-	1.8	2
None	95.5	63	100.0	12	96.9	31	96.4	106
Total	-	66	-	12	-	32	-	110

All outlets in Sunsari and five in Syangja had general waste containers in common areas, (Mugu had none in common areas), with about half of all visible general waste containers orderly. The rest of the outlets in Sunsari and Syangja were almost equally split between those with some of the general waste containers being orderly (and some not) and those with none being orderly. Similarly, all general waste containers were in an area away from public access in over three-fourths of the outlets (88% in Syangja). None of the general waste containers were closed in 80% of outlets (100% in Mugu) (Table 4.10).

Table 4.10 Distribution of Sangini outlets by condition of containers (safety boxes/bins/bags) of general waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is condition of containers in common areas (GENERAL WASTE)?								
All are orderly with everything contained inside them	48.5	32	-	-	9.4	3	31.8	35
Some are orderly with everything contained and some are not	30.3	20	-	-	3.1	1	19.1	21
None are orderly; all have things spilling over, sticking out and/or on the floor around them	21.2	14	-	-	3.1	1	13.6	15
Cannot be assessed/not kept in common areas	-	-	100.0	12	84.4	27	35.5	39
Total	100.0	66	100.0	12	100.0	32	100.0	110
Where are full containers kept (GENERAL WASTE)?								
All are in an area away from public access	74.2	49	75.0	9	87.5	28	78.2	86
Some are in an area away from public access and some are not	7.6	5	25.0	3	6.3	2	9.1	10
All are in public area	18.2	12	-	-	3.1	1	11.8	13
No full containers/Cannot be assessed	-	-	-	-	3.1	1	0.9	1
Total	100.0	66	100.0	12	100.0	32	100.0	110
What is the condition of the full containers (GENERAL WASTE)?								
All are closed	1.5	1	-	-	9.4	3	3.6	4
Some are closed, but others are not	18.6	12	-	-	9.4	3	13.6	15
None are closed	80.3	53	100.0	12	71.9	23	80.0	88
No full safety boxes seen/ cannot be assessed	-	-	-	-	9.4	3	2.7	3
Total	100.0	66	100.0	12	100.0	32	100.0	110

Regarding final disposal, more than 2-in-5 respondents reported that they burn the general waste on the open ground and another 17% said they burn the general waste material in a pit or in an enclosure. As with non-sharps infectious waste, all outlets in Mugu claimed to burn their general waste in one of those two ways. Forty seven percent in Sunsari and 44% in Syangja mentioned that their general waste is disposed of by the municipality. (Table 4.11).

In terms of frequency, 38% of all outlets, only in Sunsari and Syangja, said general waste leaves the outlet once a day or more. Twenty-nine percent said several times a week, 26% said once a week and 7% (25% in Mugu) said less often than once a week.

Table 4.11 Distribution of Sangini outlets by methods of general waste disposal

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
What is/are the main health care waste disposal method(s) used in this outlet to dispose of GENERAL WASTE? (Multiple Response)								
Open burning on the ground	42.4	28	50.0	6	34.4	11	40.9	45
Open burning in a pit or in an enclosure	10.6	7	50.0	6	18.8	6	17.3	19
Municipality/VDC	47.0	31	-	-	43.8	14	40.9	45
Private waste company	3.0	2	-	-	-	-	1.8	2
Other (waste not generated)	-	-	-	-	3.1	1	0.9	1
Total	-	66	-	12	-	32	-	110
Overall, how often does this type of waste (GENERAL) leave the outlet?								
Several times a day	3.0	2	-	-	-	-	1.8	2
Once a day	43.9	29	-	-	31.3	10	35.5	39
Several times a week	19.7	13	50.0	6	40.6	13	29.1	32
Once a week	30.3	20	25.0	3	18.8	6	26.4	29
After more than a week	3.0	2	25.0	3	9.4	3	7.3	8
Total	100.0	66	100.0	12	100.0	32	100.0	110

4.3 Presence and condition of waste outside outlets

It was also observed whether there were any waste containers outside the outlet. In 62% of the outlets the team did not find any waste containers outside the outlet. In 42 outlets the team found the waste containers outside the outlet. The proportion of outlets having any waste container outside the outlet was highest (50%) in Sunsari, followed by Syangja (25%) and least in Mugu (8%). Of the 42 outlets having container outside the outlets, 95% (n=40) had one container and the rest (n=2) had two containers. The team also observed the type of containers and the contents inside the containers. Over two-thirds (n=30) of the containers outside the outlets were cartons followed by 32% (n=14) which were bins. In the majority of containers, there was general waste. In none of the containers was sharps waste seen, while in three of the 42 containers outside the outlets, the team found non-sharps infectious waste in the container and in another 2 containers it was mixed waste (Table 4.12).

Table 4.12 Distribution of Sangini outlets by presence of waste containers outside the outlet

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Are there any waste containers outside the outlet?								
Yes	50.0	33	8.3	1	25.0	8	38.2	42
No	50.0	33	91.7	11	75.0	24	61.8	68
Do not know	-	-	-	-	-	-	-	-
Total	100.0	66	100.0	12	100.0	32	100.0	110
How many waste containers are outside the outlet? (number of pieces)								
1	97.0	32	100.0	1	87.5	7	95.2	40
2	3.0	1	-	-	12.5	1	4.8	2
Total	100.0	33	100.0	1	100.0	8	100.0	42
What type of container 1+2								
Bag	-	-	-	-	-	-	-	-
Bin	35.3	12	100.0	1	11.1	1	31.8	14
Carton	64.7	22	-	-	88.9	8	68.2	30
Total	100.0	34	100.0	1	100.0	9	100.0	44
What is inside them (container 1)								
Sharps	-	-	-	-	-	-	-	-
Non-sharps infectious	8.8	3	-	-	-	-	6.8	3
General	88.2	30	100.0	1	88.9	8	88.6	39
Mixed waste	2.9	1	-	-	11.1	1	4.6	2
Cannot assess	-	-	-	-	-	-	-	-
Total	100.0	34	100.0	1	100.0	9	100.0	44

Regarding the condition of the waste containers outside the outlet, in the great majority of the outlets (85%, 100% in Mugu), all were orderly with the content well inside the waste containers. In 5 outlets (12%), some were orderly with the content well inside them and some were not, while in one outlet none were orderly, the contents spilled over/stuck out and/or were strewn on the ground around it (Table 4.13).

Table 4.13 Distribution of Sangini outlets by condition of waste containers outside the outlet

What is the condition of the waste containers outside the outlet?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
All are orderly with everything contained inside them	84.8	28	100.0	1	87.5	7	85.7	36
Some are orderly with everything contained inside them and some are not	12.1	4	-	-	12.5	1	11.9	5
None are orderly; all have things spilling over or sticking out and/or on the ground around them	3.0	1	-	-	-	-	2.4	1
Total	100.0	33	100.0	1	100.0	8	100.0	42

Chapter 5: Equipment, Materials, Cleanliness and Resources

Information regarding the availability of equipment, supplies, directives and BCC materials were collected from each of the sampled outlets included in the study. This chapter presents findings on these aspects.

5.1 Presence and use of personal protective equipment (PPE)

In the surveyed outlets, the study team observed the presence of personal protective equipment (PPE), which includes - boots/closed-toe shoes, light gloves, heavy duty gloves, aprons, goggles and masks. Data presented in Table 5.1 shows that most of the outlets lacked all of these PPE. Light gloves were available in 26% (n=28) of the outlets (most frequently in Sunsari) followed by masks (16%- most frequently in Mugu) and heavy duty gloves (12%, only in Sunsari). Aprons were visible in 7% (n=8) outlets and boots/closed-toe shoes in one outlet - in Sunsari.

Table 5.1 Distribution of Sangini outlets by availability of PPE in the outlets, based on field team's observation

Availability of PPE in the outlets (% yes only)	Sunsari (n=66)		Mugu (n=12)		Syangja (n=32)		Total (n=110)	
	%	N	%	N	%	N	%	N
Light gloves	36.4	24	16.7	2	6.3	2	25.5	28
Masks	18.2	12	41.7	5	-	-	15.5	17
Heavy duty gloves	19.7	13	-	-	-	-	11.8	13
Aprons	9.1	6	8.3	1	3.1	1	7.3	8
Boots/Closed-toe shoes	1.5	1	-	-	-	-	0.9	1
Others (towel)	-	-	-	-	3.1	1	0.9	1

The survey team also observed which PPE were in use at the time of survey. The use of visible PPE was minimal during the visits to the outlets: only two of the 41 gloves (light and heavy) observed were seen being used, five of the 17 masks observed (all five masks observed in Mugu were seen in use by the team), and one of the eight aprons. (Table 5.2).

Table 5.2 Distribution of Sangini outlets by use of PPE in the outlets, based on field team's observation

Use of PPE	Sunsari		Mugu		Syangja		Total	
	Use	Avail able	Use	Avail able	Use	Avail able	Use	Avail able
Light gloves	-	24	1	2	1	2	2	28
Masks	-	12	5	5	-	-	5	17
Heavy duty gloves	-	13	-	-	-	-	-	13
Aprons	-	6	1	1	-	1	1	8
Boots/Closed-toe shoes	-	1	-	-	-	-	-	1
Others (towel)	-	-	-	-	1	1	1	1

All providers were also asked if they had personal protective equipment at their outlets. Approximately 2-in-3 providers (only 52% in Sunsari) reported having light gloves, followed by over two-fifths who mentioned having masks (lowest in Sunsari- 29%). Heavy duty gloves were reported by nearly one-third of the providers (none in Mugu) and aprons were reported by one-fourth of outlets (only 12% Sunsari). Less than 3% of outlets reported having boots and goggles. (Table 5.3).

Table 5.3 Distribution of Sangini outlets by availability of PPE in the outlets, based on provider's response

Availability of PPE in the outlets (% yes only)	Sunsari (n=66)		Mugu (n=12)		Syangja (n=32)		Total (n=110)	
	%	N	%	N	%	N	%	N
Light gloves	51.5	34	83.3	10	93.8	30	67.3	74
Masks	28.8	19	91.7	11	56.3	18	43.6	48
Heavy duty gloves	27.3	18	-	-	56.3	18	32.7	36
Aprons	12.1	8	41.7	5	43.8	14	24.5	27
Goggles	3.0	2	-	-	3.1	1	2.7	3
Boots / Closed-toe shoes	3.0	2	-	-	-	-	1.8	2
Other (towel)	-	-	-	-	6.3	2	1.8	2

When asked about the sources of supply of the personal protective equipment for their outlets, The great majority (71%, over 90% in Mugu and Syangja) of providers reported purchasing such materials by themselves. (Table 5.4), and over one-fourth of the respondents - 46% in Sunsari - reported not using any personal protective equipment. Masks and aprons can help prevent with infection while administering injections; all of the equipment can help prevent contact with waste during waste handling and destruction.

Table 5.4 Distribution of Sangini outlets by source of supply of PPE in the outlets

How is the outlet supplied with personal protective equipment? (Multiple Response)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
CRS supplies it	-	-	-	-	-	-	-	-
We buy it ourselves	54.5	36	100.0	12	93.8	30	70.9	78
Do not use personal protective equipment	45.5	30	-	-	6.3	2	29.1	32
Total	-	66	-	12	-	32	-	110

5.2 Presence of guidelines, job aids, BCC materials

Guidelines, job aids and BCC materials are important tools that can help to ensure quality services in the outlets. Data collectors, checking to see which of these items were visible at the outlets, observed any materials at only two outlets in Sunsari district. One was the family planning flip chart and the other a poster showing hand washing with soap. No official guidelines related to waste handling were visible to which providers could refer.

Table 5.5 Distribution of Sangini outlets by guidelines, reminders and/or job aids that promote safe handling and disposal of different types of waste (OBSERVATION)

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Are there guidelines, reminders and/or job aids visible that promote safe handling and disposal of different types of waste at this outlet?								
Yes	3.0	2	-	-	-	-	1.8	2
No	97.0	64	100.0	12	100.0	32	98.2	108
Total	100.0	66	100.0	12	100.0	32	100.0	110
Describe types of guidelines, reminders and/or job aids								
Flip chart	50.0	1	-	-	-	-	50.0	1
Poster showing hand washing with soap	50.0	1	-	-	-	-	50.0	1
Total	100.0	2	-	-	-	-	100.0	2

When asked directly, only four providers (three in Sunsari and one in Syangja district) reported having any printed policies, plans, manuals, procedures or guidelines for managing waste. Upon seeing the materials, the data collection team noted that these were in the form of flash cards, poster or pamphlet. No policies, manuals or guidelines for waste management were available. (Table 5.6).

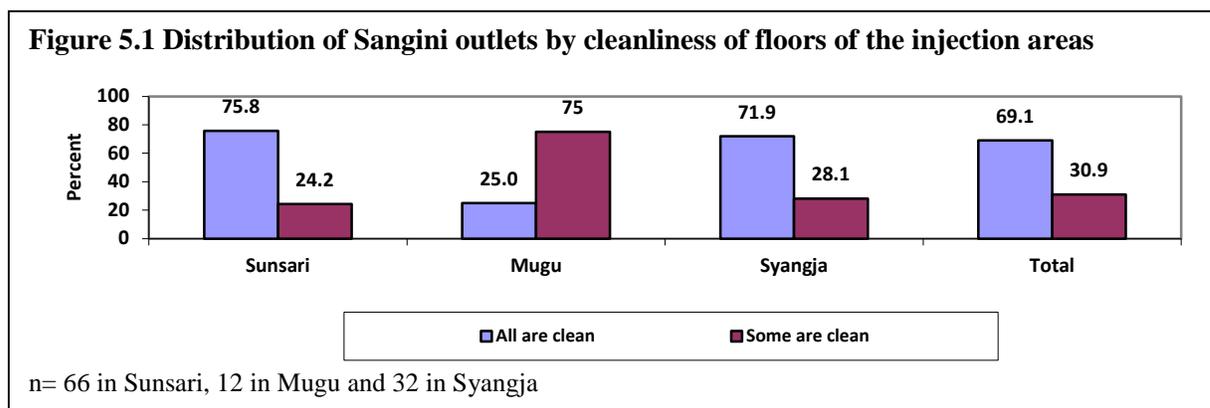
Table 5.6 Distribution of Sangini outlets by availability of any printed policies, plans, manuals, procedures or guidelines for managing waste

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
In this outlet, are there any printed policies, plans, manuals, procedures or guidelines for managing waste?								
Yes	4.5	3	-	-	3.1	1	3.6	4
No	95.5	63	100.0	12	96.9	31	96.4	106
Total	100.0	66	100.0	12	100.0	32	100.0	110
If so, please ask to see them and write down title of documents (Multiple Response)								
Flip chart	66.7	2	-	-	-	-	50.0	2

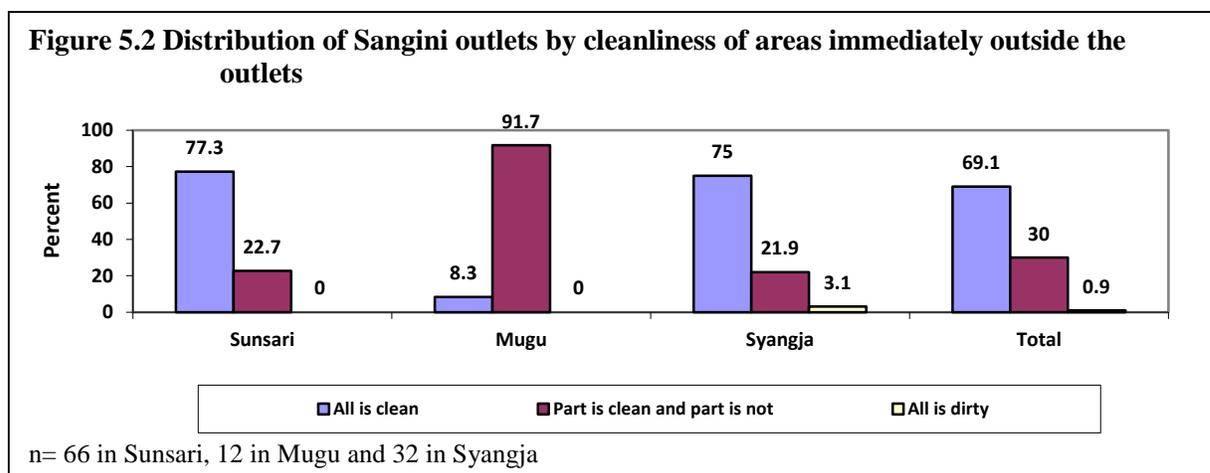
Description	Sunsari		Mugu		Syangja		Total	
Poster/pamphlets	100.0	3	-	-	100.0	1	100.0	4
Total	-	3	-	-	-	1	-	4

5.3 Cleanliness in and around outlet

The cleanliness in and around the outlet was observed by the study teams in the study areas. Cleanliness was referred to having no dust/dirt, flies and/or litter in and around the outlet. Overall, two-thirds (69%) of the outlets had all floors of the injection areas clean, whereas in the rest (31%) of the outlets the floor areas were clean to some extent. Sunsari and Syangja were much better in cleanliness when compared to Mugu district.¹ (Figure 5.1).



The data collection team also observed the cleanliness of the areas immediately outside the Sangini outlets. More than two-thirds of the outlets had clean environments. By district, approximately three-quarters of the outlets in Sunsari and Syangja had a clean environment, compared to only eight percent in Mugu. (Figure 5.2).²



¹ Apparently Mugu has a lot of dirt and wind; it's the Mugu area in general that is dirty, not just the outlets.

² Ibid.

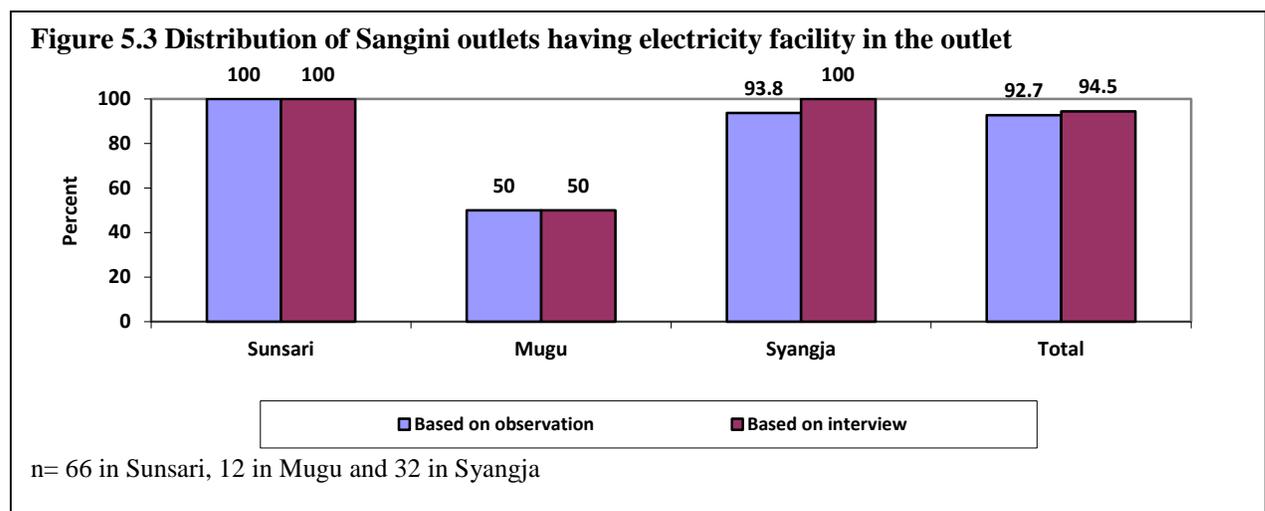
5.4 Presence of water, electricity and generator

The survey results show that water was available in the majority (96%) of the outlets. In all outlets except for four in Syangja district, the field team was able to observe water in the outlet. When asked about type of water source, almost half (46%) of the providers said their outlets had taps with running water. In about a quarter of the outlets, water was carried from outside and put in buckets with taps and in other 30% of the outlets, water was carried from outside and put in buckets with no taps. There were not major differences on type of water source by district. (Table 5.7).

Table 5.7 Distribution of Sangini outlets by availability water in the outlet

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Is there water available?								
Yes	100.0	66	100.0	12	87.5	28	96.4	106
No	-	-	-	-	12.5	4	3.6	4
Do not know	-	-	-	-	-	-	-	-
Total	100.0	66	100.0	12	100.0	32	100.0	110
What type of water source does this outlet have?								
Tap with running water	45.5	30	50.0	6	46.9	15	46.4	51
Carried from outside and put in bucket with no tap	31.8	21	25.0	3	28.1	9	30.0	33
Carried from outside and put in bucket with tap at the bottom	22.7	15	25.0	3	25.0	8	23.6	26
Total	100.0	66	100.0	12	100.0	32	100.0	110

The presence of electricity in the outlets was observed and also asked to the providers. The results were very similar. While all providers in both Sunsari and Syangja reported having electricity, only half of those in Mugu did. (Figure 5.3).



When asked if the outlets had generators in their outlets, almost all respondents (89%) replied “no”. Few (11%) outlets had generators, with little variation across districts. (Table 5.8)

Table 5.8 Distribution of Sangini outlets by presence of generator

Does this outlet have a generator?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Yes	12.1	8	8.3	1	9.4	3	10.9	12
No	87.9	58	91.7	11	90.6	29	89.1	98
Total	100.0	66	100.0	12	100.0	32	100.0	110

Chapter 6: Providers' Perceptions, Injuries and Medical Protection

This chapter deals with the perceptions and exposure of the providers in waste generation, waste handling and waste management. Specific information on provider's knowledge on injury, prevention and management related to injection, needles syringes, sharps and health care waste are also discussed in this chapter.

6.1 Knowledge, attitudes and sources of information - Providers

When asked about their level of concern about the possibility of getting infections from the used needles and syringes, nearly all respondents (95%) said they were very concerned with the possible infection from injection equipment and/or waste from this outlet. Only providers from two outlets in Sunsari reported that they were not at all concerned about it. The results are given in Table 6.1.

Table 6.1 Distribution of Sangini outlets by provider's concern on infection from used needles and syringes

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
How concerned are you about getting an infection from injection equipment/waste from this outlet?								
Very concerned	95.5	63	100.0	12	90.6	29	94.5	104
Somewhat concerned	-	-	-	-	9.4	3	2.7	3
A little concerned	1.5	1	-	-	-	-	0.9	1
Not at all concerned	3.0	2	-	-	-	-	1.8	2
Total	100.0	66	100.0	12	100.0	32	100.0	110
What diseases might someone get from a used needle? (Multiple Response)								
HIV/AIDS	100.0	66	100.0	12	100.0	32	100.0	110
Hepatitis B	95.5	63	83.3	10	84.4	27	90.9	100
Hepatitis C	48.5	32	50.0	6	40.6	13	46.4	51
Tetanus	37.9	25	66.7	8	37.5	12	40.9	45
Staph/ Staphylococcal	3.0	2	33.3	4	3.1	1	6.4	7
STI	9.1	6	-	-	-	-	5.5	6
Other§	7.6	5	16.7	2	6.3	2	8.2	9
Total	-	66	-	12	-	32	-	110

Note: § Other includes: typhoid; TB; viral fever; rabies; jaundice; injection; scabies.

Further the providers were asked what diseases someone might get from a used needle. All the providers in all three districts reported that HIV/AIDS may be transmitted through a used needle. Almost all (91% -higher in Sunsari than other districts) said it might transmit Hepatitis B, followed by 46% who mentioned Hepatitis C and 41% (67% in Mugu) who stated tetanus. There were a few respondents who said that used needles syringes may transmit Staphylococcal (6%, 33% in Mugu) and STIs (6%, all in Sunsari). About 8% mentioned various other diseases such as typhoid, TB, viral fever, rabies, jaundice, injection, and scabies. (Table 6.1).

The providers were also asked about the sources of their information on management and disposal of health care waste. The results are presented in Table 6.2. The respondents provided more than one source. Almost all (91%) reported Sangini or in-service training, with most citing both. Only a little more than a third (only 9% in Sunsari) said that they learned about waste management in their basic training (pre-service training). About half (56% in Sunsari compared to 32-38% in the other two districts) mentioned other health workers as a source. A significant proportion of respondents said they heard or saw something about waste management through media and BCC materials – radio (56%; only 31% in Syangja), book/brochure (53%, 73% in Sunsari), television (50%, only 28% in Syanjga), newspaper/magazine (36%), poster(12%), and drama/road show (6%).

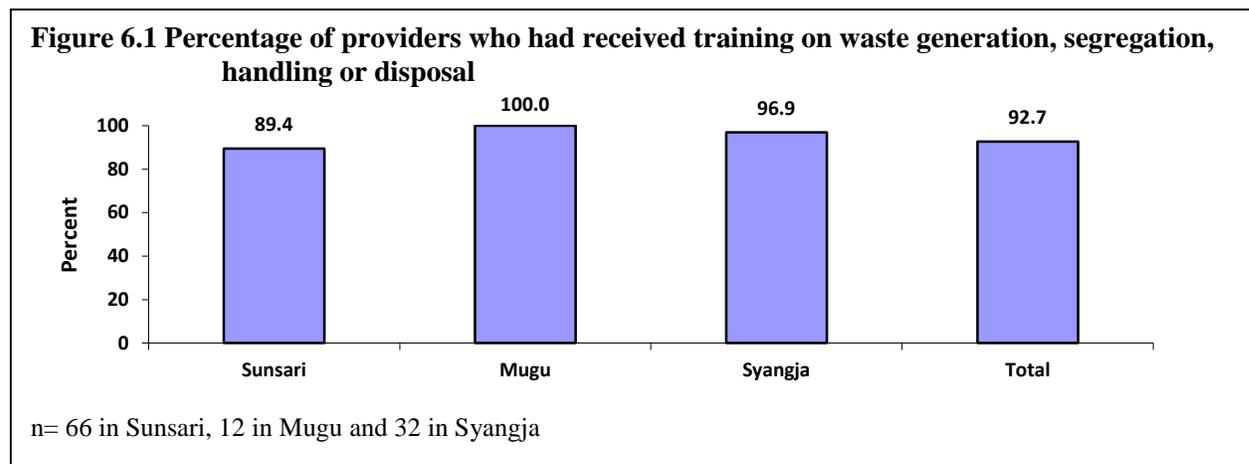
Table 6.2 Distribution of Sangini outlets by source of provider's knowledge on waste generation, handling or disposal practices

Where all have you heard or seen anything about safe waste handling or disposal practices? (Multiple Response)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Sangini training	87.9	58	100.0	12	78.1	25	86.4	95
In-service training	84.8	56	83.3	10	59.4	19	77.3	85
Radio	68.2	45	58.3	7	31.3	10	56.4	62
Booklet/brochure	72.7	48	16.7	2	25.0	8	52.7	58
Television	62.1	41	41.7	5	28.1	9	50.0	55
Other health staff/personnel	56.1	37	33.3	4	37.5	12	48.2	53
Pre--service training	9.1	6	100.0	12	68.8	22	36.4	40
Newspaper/Magazine	33.3	22	25.0	3	43.8	14	35.5	39
Poster	6.1	4	8.3	1	25.0	8	11.8	13
Drama group/Road show	9.1	6	8.3	1	-	-	6.4	7
Others	15.2	10	-	-	3.1	1	10.0	11
Total	-	66	-	12	-	32	-	110

Note: § Other includes: marketing management; environment and sanitation day; environment and sanitation program; self experience.

The providers were also asked directly if they had ever received training on waste management. Data presented in Figure 6.1 shows that 93% of the providers had received training on waste

generation, segregation, handling or disposal. By district, all the providers in Mugu followed by 97% in Syangja and 89% in Sunsari affirmed to have received training on waste management.



Nearly one-fourth (24%) of the respondents claimed to have received waste management training within last two years, followed by almost the same percentage (25%) who received the training within 3-4 years prior to the survey, approximately 28% who received training in the last 5-6 years and the remaining 25% who received it more than 6 years ago. More than four-fifths of the respondents in Mugu as opposed to 5% in Sunsari and 36% in Syangja had received training recently - within 2 years prior to the survey. The median time since the most recent training was 18 months in Mugu, 24 months for Syangja, and 59 months. (Table 6.3).

Table 6.3 Distribution of Sangini outlets by timing of most recent training on waste generation, segregation, handling or disposal

How long ago was the most recent training?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Within 1-2 years (2068-69)	5.1	3	83.3	10	35.5	11	23.5	24
Within 3-4 years(2066-67)	23.7	14	-	-	35.5	11	24.5	25
Within 5-6 years(2064-65)	35.6	21	8.3	1	19.4	6	27.5	28
More than 6 years ago(2053-63)	35.6	21	8.3	1	9.7	3	24.5	25
Mean (in months)	59.0		31.1		33.7		48.0	
Median (in months)	59.0		18.0		24.0		45.5	
Range (in months)	2-197		6-156		3-96		2-197	
Total	100.0	59	100.0	12	100.0	31	100.0	102

Cross-tabulations were calculated for the total sample between some key protective behaviors and whether training was received in last two years or not, in order to determine if there was any

significance. (Table 6.4). Four protective behaviors were found to be significantly different at 90% or 95%. Those who reported being trained in waste management in the last two years were significantly more likely than the others to report: Not disposing of sharps waste via municipal vehicles (90%), burning non-sharps infectious waste in a pit or enclosure (90%), and never recapping (95%). In addition, the field teams observed that outlets with providers who had received training in last two years were significantly more likely (90%) than others to dispose of sharps waste in safety boxes.

Table 6.4 Cross-tabulation of protective behaviors by recency of training, among total sample³

Description	Total			Significance level
	Received training in last two years			
	Yes	No	Total	
Disposes of sharps waste via municipal vehicle (n)	1	13	14	
(%)	3.40%	16.00%	12.70%	10%, t=1.747
Burns non-sharps Infectious Waste in a pit or in an enclosure (n)	10	14	24	
(%)	34.50%	17.30%	21.80%	10% , t=1.924
Never recaps needle after giving injection (n)	22	42	64	
(%)	75.90%	51.90%	58.20%	5 %,t= 2.249
Sharps waste is kept in safety box-observed (n)	22	47	69	
(%)	78.60%	58.80%	63.90%	10 % t=1.879

Note: ³ These cross-tabs were based on comparing responses among the total sample, divided by whether they received training in the last two years or not. The totals in the table are low because this summary table contains data only for one significant response, rather than all possible responses.

The providers' perceptions towards waste generation, handling or disposal were explored in this survey. When asked what issues they perceived, most providers gave multiple issues related to waste storage and waste disposal. Only 9% of respondents (25% in Mugu) did not express any issues. The results are presented in Table 6.5. The lack of an incinerator topped the issues (57%), followed by the lack/shortage of safety boxes (53%), lack of land area for burial (49%), and lack of fuel (33%). By district, the three most-mentioned issues mentioned were: Sunsari district - lack of incinerator (73%), lack of land for burial (61%), and lack of/shortage of safety boxes (56%); Mugu- the issues were: shortage/lack of safety boxes (67%), lack of incinerator (42%), and lack of fuel for burning (42%); Syangja district - lack of fuel (50%), not enough time (44%), and lack/shortage of safety boxes (41%).

Table 6.5 Distribution of Sangini outlets by provider's perception on waste generation, handling or disposal

What issues related to waste generation, handling or disposal do you perceive? (Multiple Response)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
No problems	4.5	3	25.0	3	12.5	4	9.1	10
Lack of incinerator	72.7	48	41.7	5	31.3	10	57.3	63
Lack of land area for burial	60.6	40	25.0	3	34.4	11	49.1	54
Lack of safety boxes/ Shortage of safety-boxes / sharps containers	56.1	37	66.7	8	40.6	13	52.7	58
Lack of fuel	22.7	15	41.7	5	50.0	16	32.7	36
Not enough time (to handle and dispose wastes)	15.2	10	-	-	43.8	14	21.8	24
Municipality/VDC do not collect waste	18.2	12	-	-	-	-	10.9	12
Unfilled safety boxes (as it takes time to get filled, the waste creates bad smell)	13.6	9	8.3	1	3.1	1	10.0	11
No knowledge/guidelines for safe disposal of sharps containers	13.6	9	8.3	1	-	-	9.1	10
Falling boxes during transport (the boxes may fall on the road during transport)	3.0	2	8.3	1	15.6	5	7.3	8
Others§	15.2	10	8.3	1	-	-	10.0	11
Total	-	66	-	12	-	32	-	110

Note: § Other includes: fear of fire; lack of training; inadequate no of safety boxes; polluting the environment; lack of gloves; lack of space to burn.

The respondents were asked to provide suggestions for improving health care waste management at their outlet. Similar to the responses on the question about issues, a wide range of suggestions was given. The results are given in Table 6.6. They have been grouped into three major categories: Supplies/equipment (75%; 92% in Mugu), Waste disposal (59%; 73% in Sunsari) – mostly related to burning waste, and training and/or monitoring (46%, 56% in Sunsari where half of providers had not had training on waste management in the last 5 years).

Table 6.6 Distribution of Sangini outlets by suggestions for improving health care waste management in their outlet

What suggestions do you have for improving healthcare waste management in your outlet? (Multiple Response)	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
On supplies/equipment	75.8	50	91.7	11	65.6	21	74.5	82
Arrangement of adequate quantity of safety box/dust bins; waste boxes of 3 different colors, arrangement of pots to put syringes	53.0	35	91.7	11	56.3	18	58.2	64
Arrangement of big size of safety box with cover, arrangement of buckets	28.8	19	-	-	15.6	5	21.8	24
Arrangement of necessary materials; personal protective equipment	15.2	10	16.7	2	12.5	4	14.5	16
On disposal	72.7	48	58.3	7	31.3	10	59.1	65
Arrangement of incinerator/ring/ drum to burn general waste, syringes and needles and other infectious waste	51.5	34	58.3	7	6.3	2	39.1	43
Arrangement of specific safe place to dispose (burn) all kinds of waste	27.3	18	-	-	15.6	5	20.9	23
Arranging buckets in different locations by municipalities and VDC offices; municipality and VDC offices should be responsible in collecting waste	13.6	9	16.7	2	9.4	3	12.7	14
On training/monitoring	56.1	37	41.7	5	25.0	8	45.5	50
Provision of training; refresher training; workshop on regular basis; awareness meeting; new training on waste management	45.5	30	41.7	5	25.0	8	39.1	43
Provision of regular monitoring and supervision of medical shop, monitoring to check waste management	25.8	17	-	-	-	-	15.5	17
Other								
Arrangement of adequate quantity of BCC materials such as brochure, poster, pamphlets, flip charts, sangini cards	10.6	7	-	-	6.3	2	8.2	9
Formulation of appropriate law for waste management; punishment if not disposed the waste properly	3.0	2	-	-	-	-	1.8	2
Implementing public awareness program	-	-	16.7	2	3.1	1	2.7	3

on waste management								
Other (provision of needle cutter; provision of bucket with tap; have a separate dressing table or dressing room; arrangement of towel and soap for hand washing; arrangement of big size of sangini sign board; arrangement of sterilizer; maintaining environment around shop clean)	13.6	9	-	-	18.8	6	13.6	15
Total	-	66	-	12	-	32	-	110

The three main sub-category responses (Table 6.6) were: arrangement of adequate quantity of safety box/dust bins, waste boxes of 3 different colors, arrangement of pots to put syringes (58%, but 92% in Mugu), followed by arrangement of incinerator/ring/ drum to burn general waste, syringes and needles and other infectious waste (39%, but only 6% in Syangja), and provision of training, refresher training, workshop on regular basis, awareness meeting, new training on waste management (39%, but only 25% in Mugu). Other suggestions mentioned by over 25% of Sunsari providers were: arrangement of big size of safety box with cover, arrangement of buckets (22% overall; 29% in Sunsari); arrangement of specific safe place to dispose (burn) all kinds of waste (21%, 27% in Sunsari); and provision of regular monitoring and supervision of medical shop, monitoring to check waste management (26% in Sunsari; 0 elsewhere). Two other suggestions mentioned by more than 12% of respondents were: arrangement of necessary materials and PPEs (15%) and arranging buckets in different locations by municipalities/VDC and municipalities/VDC should be responsible for collecting waste (13%).

Just under one-tenth (8%) suggested supplying adequate supplies of BCC materials, 3% suggested implementing a public awareness campaign on waste management, and 2% (all in Sunsari) suggested formulating laws for proper waste management. A further 14% gave other assorted suggestions, including: provision of needle cutter; provision of bucket with tap; have a separate dressing table or dressing room; arrangement of towel and soap for hand washing; arrangement of big size of Sangini signboard; availability of sterilizer; and maintaining clean environment around shops. (Table 6.6)

6.2 Injury, treatment and prevention – Providers

The providers were asked if they had ever had needle-stick injuries, how long ago, and whether they received post-exposure prophylaxis (PEP) to prevent HIV. 1-in-5 respondents (n=22) said they had received at least one needle stick injury in the past. (Table 6.7). The median for last needle stick injury was 12 month ago in Sunsari and 48 months in Syangja. Of the 22 reporting a needle stick, seven said their most recent stick was in the last year, three between 1-2 years ago, and 12 more than 2 years ago. None of the providers in Mugu said they'd ever had been stuck by a needle. When asked about whether they received PEP to prevent HIV after the most recent needle-stick injury, half of the 22 providers affirmed that they received PEP, 61% in Sunsari and 33% in Syangja.

Table 6.7 Distribution of Sangini outlets by whether providers had any needle-stick injuries and post-exposure prophylaxis

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Have you ever had any needle-stick injuries?								
Yes	19.7	13	-	-	28.1	9	20.0	22
No	80.3	53	100.0	12	71.9	23	80.0	88
Total	100.0	66	100.0	12	100.0	32	100.0	110
How long ago was the most recent needle-stick? (month ago)								
Less than one year	38.5	5	-	-	22.2	2	31.8	7
1-2 years	23.1	3	-	-	-	-	13.6	3
2 years or more	38.5	5	-	-	77.8	7	54.5	12
Mean (in months)	22.5		-	-	37.8		28.7	
Median (in months)	12.0		-	-	48.0		24.0	
Range (in months)	1-120		-	-	0-96		0-120	
Total	100.0	13	-	-	100.0	9	100.0	22
Did you receive treatment to prevent HIV (post-exposure prophylaxis) after that stick?								
Yes	60.5	8	-	-	33.3	3	50.0	11
No	38.5	5	-	-	66.7	6	50.0	11
Total	100.0	13	-	-	100.0	9	100.0	22

The respondents were also asked if they had ever received a Hepatitis B vaccine. More than half (56%) of the providers (69% in Syangja) said they have received a Hepatitis B vaccine. When asked about the timing of vaccination, the majority (73%) had it two or more years ago. The median for those that received it was two years ago in Syangja, three years ago in Mugu, and six years ago in Sunsari. With regards to the number of Hepatitis B injection, nearly three-fourths had received the recommended three (or more), but about a quarter of the respondents (33% in Sunsari) had received only one or two doses of Hepatitis B vaccine (Table 6.8).

Table 6.8 Distribution of Sangini outlets by whether providers received Hepatitis B vaccine

Description	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Have you ever received a hepatitis B vaccine?								
Yes	50.0	33	58.3	7	68.8	22	56.4	62
No	50.0	33	41.7	5	31.3	10	43.6	48
Total	100.0	66	100.0	12	100.0	32	100.0	110
How long ago did you receive the hepatitis B vaccine?								
Less than one year	3.0	1	-	-	27.3	6	11.3	7
1-2 years	21.2	7	-	-	13.6	3	16.1	10
2 years or more	75.8	25	100.0	7	59.1	13	72.6	45
Mean (in months)	59.5		45.4		26.5		46.2	
Median (in months)	60.0		36.0		24.0		36.0	
Range (in months)	2-168		26-83		3-72		2-168	
Total	100.0	33	100.0	7	100.0	22	100.0	62
How many Hepatitis B injections did you receive altogether?								
1	24.2	8	14.3	1	9.1	2	17.7	11
2	9.1	3	14.3	1	9.1	2	9.7	6
3	48.5	16	71.4	5	72.7	16	59.7	37
4	15.2	5	-	-	9.1	2	11.3	7
6	3.0	1	-	-	-	-	1.6	1
Total	100.0	33	100.0	7	100.0	22	100.0	62

The respondents were also asked when they last had received tetanus toxoid (TT) vaccine. Sixteen percent received their last TT vaccine more than ten years ago, which means it is no longer effective (TT lasts ten years). By district, two of the providers in Mugu said they never received a TT, but the other 83% are up to date, though 25% received theirs between 6 and 10 years ago; 25% in Syangja have passed their 10 years and another 22% will need one in the next couple of years, and in Sunsari 14% have passed their 10 years and another 14% will need another in the next couple of years. (Table 6.9).

Table 6.9 Distribution of Sangini outlets by whether providers received tetanus vaccine

When did you last receive a tetanus vaccine?	Sunsari		Mugu		Syangja		Total	
	%	N	%	N	%	N	%	N
Less than one year	36.4	24	16.7	2	15.6	5	28.2	31
1-2 years	9.1	6	8.3	1	6.3	2	8.2	9
2-5 years	13.6	9	33.3	4	31.3	10	20.9	23
6-10 years	13.6	9	25.0	3	21.9	7	17.3	19
More than 10 years	13.6	9	-	-	25.0	8	15.5	17
Mean (in months)	43.9		43.5		73.4		53.4	
Median (in months)	12.0		54.5		55.0		36.0	
Range (in months)	1-240		5-80		2-360		1-360	
Never received TT vaccine	-	-	16.7	2	-	-	1.8	2
Do not know	13.6	9	-	-	-	-	8.2	9
Total	100.0	66	100.0	12	100.0	32	100.0	110

6.3 Knowledge, attitudes and sources of information – Waste Handlers

This section applies only to the waste handlers (other than the providers). There were only two outlets – both in Sunsari - which had separate personnel for handling health care waste in the outlet. Both were very concerned with the diseases they might contract from a used needle. When asked to name the diseases that they could get from contact with a needle they said HIV/AIDS and Hepatitis B.

When asked to identify the sources of their knowledge on waste management, they named radio, television, magazine, NGO and the municipality. Of the two, one had received training.

When asked about the issues related to waste disposal one of them said shortage of safety boxes while the other said no problems at all. Regarding suggestions for improving healthcare waste management in the outlet, they said: arrangement of incinerator (n=1) and big bucket to keep waste (n=1); provision of training on regular basis (n=1); and regular monitoring and supervision (n=1) (Table not shown).

6.4 Injury, treatment and prevention – Waste Handlers

The two waste handlers were also asked the questions on injury, treatment and prevention. Neither said had ever experienced needle-stick injuries. Neither had received the Hepatitis B vaccine, but both had received TT shots, one a month ago and the other a year ago (Table not shown).

Chapter 7: Summary of Results, Conclusions and Recommendations

USAID's *Ghar Ghar Maa Swasthya* (GGMS) or Healthy Homes Project seeks to graduate CRS to become a viable private sector company and also to increase the availability and accessibility of health products in the selected hard-to-reach rural areas. The program will assist the Government of Nepal to expand the depth, reach, and impact of the private sector in social marketing, and provide low-cost maternal and child health, family planning, and HIV prevention products and services.

The primary objective of the survey was to conduct an assessment of health care waste management among CRS's Sangini franchising outlets, with specific objectives to explore the current sanitation situation and waste handling practices by providers and other waste handlers at Sangini outlets including problems faced and suggestions for improvement.

The assessment was carried out in three intervention districts. A total of 110 outlets were included (66 outlets in Sunsari, 32 in Syangja and 12 in Mugu districts) were covered and an injection provider interviewed at each outlet. As only two outlets, both in Sunsari, had someone other than the provider who handles waste, there are no significant findings about these people. A survey tool consisting of structured questionnaire and observation were used to collect information. The questionnaire has five sections. Six trained field staff collected information during November and December, 2012.

7.1 Summary of results

Injections and Injection practices

- While almost all outlets are open five to seven days per week, a few are only open three days a week.
- On average, each outlet in Sunsari gives about four times more injections (and generates four times more sharps waste) per week than those in Mugu and Syangja. The more injections a provider gives, the more at risk s/he is.
- Generally, outlets have one place for injections, but some have more than one.
- Only half of these outlets (none in Mugu) seem to be using auto disable syringes for (any) injections.
- Providers are aware that needles should not be reused and maintain they never do.
- One third (half in Sunsari) of providers said they always recapped needles after injection. In addition, the recappers in Sunsari are giving more injections per week than non-recappers. This practice increases chances of needle sticks. Stopping recapping is difficult worldwide, since providers were trained to recap when needles were reused; now that needles are no longer being reused, it is unnecessary.
- About 10% (only in Sunsari and Syangja) of providers are detaching the needle from the syringe, after giving injection. This is another way of increasing chances of needle sticks and not necessary from a waste management perspective.

- Used needles and syringes seem to be disposed of in containers. However, in Sunsari, a number of outlets had other loose sharp items which could cause injuries to providers and clients.
- Where disposable safety boxes are not used, providers are more likely to come into contact with used needles and/or syringes when they empty the containers.

Safety boxes

- There is no standard practice for what type of safety box is used. And most outlets in Syangja and Mugu use both disposable and non-disposable types, which most likely depends on what type of containers they receive. Where disposable safety boxes are not used, providers are more likely to come into contact with used sharps when they empty the containers.
- Safety boxes are not available in all facilities, nor in all injection areas in each facility (in those facilities with more than one injection area). Providers who carry used sharps from one place to dispose in another are at greater risk of needle sticks than those who have a safety box within arm's reach.
- While most outlets have orderly, self-contained sharps containers, some (7%) have at least one box that is overfilled or has equipment sticking out. A good proportion of providers say they wait to remove safety boxes until they are filled higher than they should.
- Significant out of stocks for safety boxes were found for outlets (half) in the last six months; for 19% of all outlets it seems to be a frequent occurrence.
- Most providers say they keep sharps waste in a bin or box when no safety box is available.

Waste disposal, segregation and storage

- There is no standard practice for final disposal of sharps or NSI waste.
 - The safety of the main method of open burning on the ground is questionable since it's not clear if it's thoroughly burnt or what is done with the waste after it's burnt.
 - In addition 13% of providers said their sharps waste and 33% said their NSI waste were collected by municipal/VDC, which could spread infection to both the waste handler and the public.
- No outlets had two-chamber medium or high temperature incinerators
- There is no standard practice for frequency of disposal of sharps or NSI waste. Sharps waste was disposed of less frequently than weekly by the majority (70%) of outlets and NSI waste was disposed of less frequently than weekly by 9% (41% in Mugu).
- Almost one-fourth of outlets are not separating sharps from other waste and 41% (almost 60% in Syangja) were not separating NSI waste from other waste.
- Almost half of outlets in Sunsari are not keeping sharps waste in safety boxes. 11% of outlets kept NSI in safety boxes.
- There is no standard practice in Sangini outlets as to how self-contained containers were, whether they were covered, nor if the sharps and NSI containers are kept somewhere where the public has no access.
- The number of safety boxes filled per week by outlet per district ranges from none to 10, with a median of .25 per outlet in Sunsari (where more injections are given but outlets are

less likely to have safety boxes) to 1.5 in Mugu and 3 in Syangja. The number of containers of NSI generated ranged from .25 to 7 bins per week.

- A small proportion of outlets had NSI and mixed waste in containers outside the outlet, posing an infection risk to the greater community.
- In 38% of outlets (50% in Sunsari) waste containers were seen outside the outlet, 95% of which only had one container, which were mainly cartons. In almost all cases, these containers were self-contained and orderly, but in 14% (mostly in Sunsari) of outlets with containers outside were not self-contained.

Equipment, Materials, Cleanliness and Resources

- Low levels of PPEs were visible or used during visit of data collector with somewhat higher - but still low - levels of PPE available, with gloves, masks and aprons most common. However 29% (45% in Sunsari) said they don't use any PPEs. The remainder buy it themselves.
- No guidelines, job aids or BCC materials on the topic of waste handling were available in any of the outlets.
- Generally Sunsari and Syangja outlets had fairly clean floors in injection areas as well as outside the outlets. This was not the case for Mugu.
- Virtually all outlets (except for 4 in Syangja) had water available. About 30% used buckets with no tap, which means they need to dip into the bucket which is not sanitary.
- Half of the outlets in Mugu did not have electricity.

Providers' Perceptions, Injuries and Medical Protection

- 95% of providers said they were very concerned about getting an infection from used injection equipment.
- All providers knew they could get HIV/AIDS from a used needle and 91% mentioned Hepatitis B. 46% mentioned Hepatitis C and 41% mentioned tetanus.
- Over 90% of providers said they had received either Sangini or other in-service training on the HCWM at some point. Other sources of information come from media, materials and other health staff. Only about one-third of providers mentioned pre-service training, which ranged from 100% in Mugu to 69% in Syangja to 9% in Sunsari.
- Less than one-fourth of providers (but 83% in Mugu) said the most recent training they received was in the last two years. In Mugu the median for most recent training was 18 months ago, compared to 2 years in Syangja and 5 years in Sunsari.
- Those reporting HCWM training in the last 2 years were significantly more likely than others to practice protective behaviors including: not disposing of sharps waste via municipal vehicles (90%), burning non-sharps infectious waste in a pit or enclosure (90%), and never recapping (95%). In addition, the field teams observed that outlets with providers who had received training in last two years were significantly more likely (90%) than others to dispose of sharps waste in safety boxes.
- Providers gave multiple answers when asked what issues they had. The lack of an incinerator topped the issues (57%), followed by the lack/shortage of safety boxes (53%), lack of land area for burial (49%), and lack of fuel (33%).

- Providers gave similar suggestions for how to improve HCWM, which group together into categories of supplies/equipment, disposal and training/monitoring.
- Twenty percent of providers reported ever having a needle stick, with 32% of these in the last year. Among the 9 with needle sticks in the last year, only 50% received PEP.
- Only 56% had ever received an Hepatitis B vaccine, with only 72% of those receiving at least the necessary 3 injections.
- Virtually all providers received Tetanus vaccines. However, 16% received them more than 10 years ago and are therefore likely no longer protected.

7.2 Conclusions

- There is no evidence of reuse of needles/syringes at these outlets.
- Providers are aware of health care waste management dangers in their outlet and concerned about the consequences to themselves.
- Providers know they should segregate and destroy sharps and non-sharps infectious (NSI) waste. Most are doing so with sharps; fewer are segregating NSI waste.
- However, there are no effective systems in place nor standards observed related to:
 - Segregation or destruction of sharps and NSI waste; some outlets put them in general waste for the municipal/VDC vehicles to collect
 - Provision of supplies and equipment to better segregate and destroy sharps and NSI waste. Many outlets did not have safety boxes at the time of the visit and 19% of outlets report this is a frequent occurrence. There is no standard container supplied for NSIs, which makes it harder for providers to segregate NSIs.
 - Training on HCWM; some report never being trained on the subject; only one-third (all in Mugu) mention having received any pre-service training in HCWM
- Many providers say they are not following important protective behaviors:
 - many are recapping
 - some are separating the needles from the syringe after giving injections
 - few are using PPEs
 - insufficient numbers are receiving PEP after needle sticks or getting all three Hepatitis B vaccines or keeping their tetanus protection up to date
- Most providers made multiple suggestions how to improve HCWM, focused on better systems for segregation, destruction and training/supervision, many of which are included in the recommendations section.

7.3 Recommendations

F. Develop HWCM guidelines for segregation, storage and regular, effective final disposal of sharps and NSI waste and improved protective behaviors for Sangini outlets.

G. Outline a strategy to implement a more systematic approach to segregation and disposal of sharps and NSI waste.

4. *Consider a district-wide intervention, including a contract with a private company/NGO to collect sharps and NSI waste once a week (possibly twice a week for outlets giving a lot of injections) and take them to an official incinerator for destruction. During this weekly visit, the contractor would also provide each outlet with adequate quantities of empty disposable safety boxes for sharps and thick plastic bags of a unique, standard color that the outlets would put inside some container to segregate NSIs.*
5. The purpose for the **thick plastic bags** of a unique, standard color is three-fold:
 - To easily identify which is the NSI waste,
 - To keep NSI waste safely contained within the bag, and
 - To make it easy to collect and transport NSI waste.
6. **Disposable safety boxes** are strongly recommended as they provide the most safety, since they are covered, self-contained and can be burned with all the contents inside. Therefore, once the injection is over and the provider puts the needle and syringe through the small hole in the safety box, no one is further exposed to them. Non-disposable boxes are more likely to result in needle sticks for the following reasons:
 - The providers need to either keep the lid off or remove the lid and put it back on each time that they dispose of a needle;
 - The bucket is likely to overturn, resulting in someone having to pick up all the needles and syringes and put them back in each time;
 - When providers dispose of sharps from a non-disposable box, they are likely to come in contact with the needles and/or syringes when removing them from the bucket.
4. **Other recommendations for segregation, storage and disposal** of waste are:
 - Ensure that visits to outlets (for supplies, disposal and supervision) are made on days when the outlets are open.
 - Plan for outlets with more than one injection place – by providing supplies of safety boxes, NSI plastic bags, posters, etc. for each location.
 - Assure that each Sangini outlet continues to receive one auto disable syringe for each vial of Sangini and that encourage them to use the AD syringe to give Sangini.
 - Keep all waste containers away from public areas, and closed, with waste completely contained inside to minimize infection possibilities.
 - Keep all waste inside outlets, except when pickups scheduled. Any waste left outside outlets should be orderly, closed, and completely within any container.

H. Consider providing supplying specific equipment, materials, and resources, such as:

- Aprons (PPE) are durable, reusable and can be effective preventing infection while administering injections. They could also be branded “Sangini” and therefore serve as a marketing tool in addition to protecting the provider.
- Job aids/BCC materials can remind providers about the importance of safe handling of sharps, segregating and safe disposal of sharps and NSI wastes.
- Buckets with taps to those outlets using buckets with no taps, to decrease the risk of infection.

I. Develop and implement more focused HCWM training. Start training those who have not received any recently. Among the three districts, the highest need for training in the short-time is in Sunsari, followed by Syangja.

8. Provide **positive reinforcement** to providers regarding their overall good practice of not reusing needles.
9. Without making providers scared, use their concern about getting an infection from used injection equipment to **motivate safer injection and waste handling practices**. Emphasize that “it’s in their hands” to reduce their chances of infection.
10. Since each time they handle a needle/syringe they and their patients may be at risk of infection, it’s important to motivate providers to **ALWAYS do the following protective actions:**
 - Not recap needles after injection (recapping is no longer necessary, now that needles are not being reused)
 - Not separate needles from syringes
 - Throw needle and syringe immediately into disposable safety box
 - Put NSI waste immediately into container with X color plastic bag
 - Keep all waste, especially sharps and NSI waste, well-contained and away from the public.
 - Check all injection locations every morning to make sure if any new safety boxes or plastic bags for NSI will be needed and prepare them before opening the outlet.
 - Make sure to remove safety boxes when the contents reach the line on the front and NSI bags when full enough so that they still close.
 - In addition, no sharp materials (like scissors, razor blades, etc.) should be kept in open containers or lying around loose.
11. Explain and demonstrate the importance to their safety of using **PPEs**. Indicate which, if any PPE will be provided. Show them each type of PPE, even if it will not be provided, explain the value/purpose of each and ask them to practice putting them on and to discuss when they would use it.
12. Provide more information about what might happen as a result of needlesticks and encourage Sangini providers to access **PEP** in case of need. Help them determine where they can do this.

13. Provide information about the importance of getting all three Hepatitis B doses once as well as Tetanus boosters every 10 years. Help them determine where they can do this.
14. As part of the training, have them practice assembling safety boxes, placing boxes and bags in appropriate places, giving injections to oranges or other fruit and dispose of equipment, include exercises on what types of waste is sharps/NSIs and general, using PPEs, etc.

J. Work with pre-service training authorities to adapt the elements of the Sangini training module on HCWM for their training of Certified Medical Assistants.

K. Develop reminder materials to encourage improved segregation, protective post-injection behaviors and how to access PEP, Hepatitis B and Tetanus

3. Develop and pretest a poster which covers the five key protective behaviors listed above with clear images, including images of what exactly NSI waste is.
4. Develop a referral card to encourage providers to get PEP, Hep B and Tetanus injections, including information on where specifically they can get it.

L. Revise supervision checklist to include the key protective behaviors and other HCWM guidelines and train supervisors how to address these during their regular monitoring visits.

2. **Supervisors should make sure to reinforce all of the elements of protective post-injection behaviors, supplies and resources for treatment/prevention during each visit.**
 - The supervisor should check with each provider as to what done for the last needle stick as well as how many Hepatitis B injections the provider has as well as when they had their last tetanus injection, and remind them of when they should get them and where.
 - The supervisor should observe presence of and proper use of whatever equipment has been provided and/or recommended.
 - The supervisor should also work with the outlet providers to determine how to keep the premises clean, especially in districts like Mugu.

Annex 1 Field staff training schedule, November 11 to 13, 2012

<i>Day</i>	Session	Activities
1	Morning	Welcome and introduction Orientation to Health Care Waste Management Program Objectives of the Study and Methodology
		Lunch Break
	Afternoon	Introduction to Consent Form Discussion on Questionnaire (Section 1)
2	Morning	Review of previous day activities Discussion on Questionnaire (Sections 2-5)
		Lunch Break
	Afternoon	Discussion on Questionnaire (continued)
3	Morning	Review of previous day activities Role Play Lunch Break
	Afternoon	Role Play (continued) Ethical issues on research of human subjects Formation of team

Annex 2 Summary, conclusions and recommendations table

Topic	Findings	Conclusions	Recommendations : intervention should
Injections and Injection practices			
Hours	Almost all (95%) Sangini outlets are open every day. Three percent were open six days/week, one percent was open five days and two percent were open three days a week.	While almost all outlets are open five to seven days per week, a few are only open three days a week.	Ensure that visits to outlets (for supplies, disposal and supervision) are made on days when the outlets are open.
Number of injections	The number of injections given during a week varies by outlet and by district. Sunsari has the highest mean and median number of injections (84 and 55, with one outlet giving 350), followed by Mugu (22 mean and 20 median, with a maximum of 40) and Syangja (18 mean and 11 median, with a maximum of 90).	On average, each outlet in Sunsari gives about four times more injections (and generates four times more sharps waste) per week than those in Mugu and Syangja. The more injections one gives, the more at risk s/he is.	Address high weekly levels of injection in some outlets which increase the risk of infection), but also be flexible for districts with outlets giving fewer injections per week. (Amount of supplies and frequency of waste disposal.) Also, during training and supervision, emphasize that the more injections one gives, the more careful one has to be.
Number of places in outlets for injections	Most outlets have only one place to give injections, but some in Sunsari and Syangja have two places and one outlet in Sunsari had four.	Generally, outlets have one place for injections, but some have more than one	Include strategy for outlets with more than one injection place – by providing supplies for each location, such as safety boxes, posters, etc.
Types of syringe used	All outlets reported using standard disposable syringes. Only about half – almost all in Syangja, half in Sunsari and none in Mugu – reported using auto disable syringes.	Only half of these outlets (none in Mugu) seem to be using auto disable syringes for (any) injection.	Assure that each Sangini outlet receives one auto disable syringe for each vial of Sangini.
Re-use of needles	No evidence of reuse of injection equipment was observed. In addition, all of the respondents reported never re-using	Providers are aware that needles should not be reused and maintain they never do.	Provide positive reinforcement (via supervision and training) to providers regarding their overall good

Topic	Findings	Conclusions	Recommendations : intervention should
	needles.		practice of not reusing needles.
Immediate post injection disposal	Almost all providers said they throw both needle and syringe into safety box immediately after injection. However, 8% (none in Mugu) said they remove the needle from the syringe and put the needle in the safety box and the syringe in general trash.	Almost all providers are minimizing the risk of infection immediately after an injection. But about 10% (only in Sunsari and Syangja) are at risk of needle sticks because they are detaching the needle from the syringe.	Remind providers (training, supervision, BCC material) that they should immediately dispose of needles immediately after injections – not to detach them. Each time they handle them, they put themselves at risk.
Recapping	About one-third of providers said they always recap the needle after injection. This was most common in Sunsari where half said they always recapped. Eight percent said they sometimes recapped. More Sunsari providers who always recap are likely to give more injections per week than those who never recap.	While more than half of providers said they never recapped, one third (half in Sunsari) said they always did. In addition, more recappers in Sunsari are giving more injections per week than non-recappers. When needles were being reused, recapping was standard practice. However, now that needles are not reused, this practice puts the provider at risk of needle sticks.	Explain (training, supervision, BCC material) that recapping is no longer best practice, demonstrate that it can be dangerous to providers, have them practice not recapping and remind them not to.
Loose used sharps	No loose needles or syringes were seen inside or outside of any of the outlets. Other types of sharps, however, such as bottles, broken glass, knives, blades and scissors were seen loose in 21% of outlets in Sunsari, but not in other districts.	Used needles and syringes seem to be disposed in containers. However, in Sunsari, a number of outlets had other loose sharp items which could cause injuries to providers and clients.	Reinforce the need to keep all sharp materials, not just needles, out of open containers or lying around loose, in order to reduce injuries to clients and providers.
Sharps waste management and safety boxes			
Quantity of	Just under half the outlets	The number of safety	Remove or ensure

Topic	Findings	Conclusions	Recommendations : intervention should
safety boxes filled per week	said they did not even fill one safety box per week. This was highest in Sunsari, where outlets are less likely to have safety boxes (see below). Fourteen percent (all in Syangja) said they filled 4-10 per week, while no outlet in Sunsari and Mugu reported more than two boxes per week.	boxes filled per week by outlet per district ranges – from none to 10, with a median of .25 per outlet in Sunsari (where more injections are given, but outlets are less likely to have safety boxes) to 1.5 in Mugu and 3 in Syangja	destruction of safety boxes at least weekly.
Separation	In three-fourths of outlets (92% in Mugu) data collectors observed that sharps waste was separated from other waste. In Mugu and Syangja, at least three-fourths of outlets kept sharps waste in a safety box, compared to only about half in Sunsari (53%), where the rest kept it in bins or boxes. Few (under 6%) outlets kept sharps waste in containers with plastic bags, with all outlets using white bags and some using white or green.	Almost one-fourth of outlets are not separating sharps from other wastes. Almost half of outlets in Sunsari are not keeping sharps waste in safety boxes.	Provide safety boxes and other supplies, training and reinforcement to motivate greater separation of sharps from other waste.
Color of safety boxes/containers	Among those outlets with safety boxes, over four-fifths in Sunsari and Syangja used red safety boxes, compared to one-fifth in Mugu, where 70% used white safety boxes.	There is no standard practice in Sangini outlets as to what safety boxes are used.	Develop standards for what safety boxes should be used for sharps in all Sangini outlets and ensure adequate and regular supplies of safety boxes to outlets.
Condition of sharps waste containers	At all outlets in Sunsari, sharps waste containers were in common areas, compared to none in	There is no standard practice in Sangini outlets as to where and how sharps containers	Develop and implement standards to keep sharps waste containers out of common areas, keep all

Topic	Findings	Conclusions	Recommendations : intervention should
	<p>Mugu and 3% in Syangja. Despite this, almost all outlets in Sunsari had all sharps waste containers away from public access. At the Sunsari outlets, about forty percent had at least one sharps waste container that was not well contained. About one-third of outlets (only 10 % in Syangja) had at least one sharps container that was not closed.</p>	are kept, in terms of common areas, whether the waste is kept within the container and whether the container is closed.	waste within the containers and keep the container closed, to minimize exposure to providers and public.
Where are full containers of sharps kept	Almost all full safety boxes/containers are kept in the injection room. Six percent of providers said they were kept in another room and four percent said elsewhere, including in front of the shop.	Full sharps containers are mainly kept in the injection room.	Destroy full (closed) sharps containers as soon as possible; until then, remove them from common areas, if possible into another room.
Incinerators	No outlets had real incinerators, but about half (none in Mugu) had tin boxes that can be used for burning.	No outlets had two-chamber medium or high temperature incinerators	Identify incineration facilities within the area that can be used to destroy sharps waste.
Disposal method	<p>The three main methods used for disposing of sharps waste is open burning on the ground (51%), open burning in a pit or enclosure (29%), and burial (29%). Another 13% (mostly in Sunsari) said it's disposed of by the municipality/VDC and 12% (only in Sunsari) by dumping into protected pit.</p>	There is no standard practice for final sharps disposal. The main method of open burning on the ground is questionable since it's not clear what is done with the waste after it's burnt. In addition, having sharps waste picked up by the municipality is dangerous to both the waste handler and the public.	Ensure destruction of sharps in an effective manner, by developing collection strategy for outlets. In addition, develop and train outlets with recommended procedure for outlets to destroy onsite (in case not picked up) and provide necessary supplies for this procedure.
Disposal	The majority of providers	There is no standard	Remove or ensure

Topic	Findings	Conclusions	Recommendations : intervention should
frequency	(70%, 92% in Mugu) said that sharps waste was destroyed less frequently than once a week, followed by 17% who said once a week. Five percent said that sharps waste leaves the outlet once a day.	practice for frequency of disposal of sharps waste. The great majority (87%) of outlets do so once a week or less frequently.	destruction of sharps waste at least weekly; more frequently if possible in outlets giving more injections.
Safety boxes			
Type used	Half of providers (73% in Sunsari) said they used non-disposable containers only. 23% said they used disposable only and the rest (3% in Sunsari, but 53% in Syangja and 67% in Mugu) said they used both.	There is no standard practice for what type of safety box is used. And most outlets in Syangja and Mugu use both disposable and non-disposable types. It is probably dependent on what type of containers they receive.	Implement standard safety box approach. Disposable safety boxes are safer, since they reduce opportunities for contact with used needles and syringes. However, the disposable boxes must continually be supplied. When setting up supply and disposal system, keeping outlets regularly supplied with sufficient disposable safety boxes should be a key objective.
Availability of safety boxes	About one third of outlets visited during the study had no visible safety boxes. This was highest in Sunsari (44%). Only one of the outlets with two (and one with four) different injection areas had a safety box in the second area. There was an average of 1.25 safety boxes in each outlet that had any.	Safety boxes are not available in all facilities, nor in all injection areas in each facility. Providers who carry used sharps from one place to another are at greater risk of needle sticks.	Ensure that an open unfilled safety box is available at each injection location at all times.
Condition of safety boxes	Seven percent of outlets with at least one safety box had some or all of safety boxes overfilled or with equipment sticking	While for the most part, providers are keeping sharps container orderly, some (7%) have at least one box that is	Remind providers to be careful to make sure that injection equipment is contained completely within a safety box and

Topic	Findings	Conclusions	Recommendations : intervention should
	<p>out.</p> <p>Just over one-third of providers (50% in Sunsari) said they removed safety boxes from the injection area when they were completely filled – above the recommended level. Few of the outlets with safety boxes (17%) had at least one with the hole covered.</p> <p>In addition, virtually all providers said that they didn't do anything to cover the hole.</p>	<p>overfilled or has equipment sticking out. A good proportion of providers say they wait to remove safety boxes until they are filled, later than they should be, if they followed the level indicated on the container.</p> <p>Very few had covered the hole on top (but only the white cardboard containers have a hole).</p>	<p>to close and stop using (and remove) a safety box when the contents reach the line marked on it; at that point, they should start using another one.</p>
Stockouts of safety boxes	<p>About half the providers (two-thirds in Mugu) said their outlet was out of safety boxes at some point in the last six months. One-third (35%) of total outlets said that they were out of safety boxes frequently or sometimes.</p>	<p>Significant out of stocks for safety boxes were found for outlets (half) in the last six months; for 19% of all outlets it seems to be a frequent occurrence.</p>	<p>Ensure regular supplies of sufficient safety boxes to each outlet, with the quantity depending on the number of injection sites and injections given.</p>
What done with sharps when out of safety boxes	<p>Most providers say they keep sharps waste in bin or box when no safety box is available.</p>		
Frequency of emptying safety boxes	<p>Two-fifths said safety boxes are emptied often (only 8% in Mugu where disposable boxes are used more) and one third said sometimes.</p>	<p>Where disposable safety boxes are not used, providers are more likely to come into contact when they empty the containers.</p>	<p>Ensure regular supply and use of disposable safety boxes to reduce risk.</p>
What done with needles and syringes emptied from safety box	<p>Almost all outlets (85%) stated both were burned, but small percentages said they were buried or put in general or infectious waste or sent through the municipal vehicle</p>	<p>While burning is the main way to dispose of sharps waste, some outlets are not destroying sharps, but combining them with other waste and/or</p>	<p>See recommendation for final disposal.</p>

Topic	Findings	Conclusions	Recommendations : intervention should
		leaving them for the municipality to collect, which is dangerous.	
Non-sharps infectious waste (NSI)			
Quantity of NSI waste generated per week	The median of one bin of NSI was generated per week per outlet. This was the amount in Syangja as well, but in Mugu outlets generated a median of .5 bins and in Sunsari, where outlets had a higher number of injections, they generated a median of 2 bins of NSI per week. The maximum ranged from 2 bins in Mugu to 7 bins in Sunsari. The minimum was .25 in Mugu and Syangja and 1 bin in Sunsari.	Outlets are generating between .25 and 7 bins of NSI waste per week.	NSI waste needs to be removed weekly from outlets
Separation	In just over half the outlets (56%), NSI waste was seen to be separated from other waste. This ranges from a low of 28% in Syangja to a high of 75% in Mugu. When providers were asked what they do with NSI items such as cotton used to apply pressure to patient's skin after injection, 68% said separate container for infectious waste and 7% said safety box. However, 26% (53% in Syangja), said they were put with general waste.	While most outlets appear to be separating NSI waste, some, the majority of outlets in Syangja and a significant minority in the other districts - are mixing NSI with general waste.	Outlets need to do a better job of segregating NSI waste. In addition to training and reminders, providing adequate, regular supplies for it to be kept should improve the situation.
Where NSI waste kept	11% of outlets had NSI in safety boxes, most of the rest kept it in boxes or		

Topic	Findings	Conclusions	Recommendations : intervention should
	bins with no plastic bag.		
Color of safety boxes/containers	The majority of the safety boxes/bins containing NSI were blue or green. In Syangja, red was equally popular as blue/green.		
Condition of NSI waste containers	In about half of the outlets where containers with NSI were in common areas, at least some of the containers did not have all waste neatly contained with the container.	NSI waste is not always kept within containers.	
Storage of full containers	While almost outlets kept all full NSI containers away from public access, about 10% of outlets in Sunsari had full NSI containers in public areas. About three-fourths of the outlets had full containers (100% in Mugu) that were not closed.	Full containers of NSI waste was not always kept away from the public and was generally not closed. This could prove risky.	NSI waste containers should be kept away from public areas, waste should be completely contained and the containers closed.
Disposal method	The main method reported for disposal of NSI waste was burning (65%), especially in a pit or enclosure (43%). However about one-third of providers (only in Syangja and Sunsari) reported that they were disposed of by the municipality/VDC.	While most outlets burned NSI waste, a significant amount is disposed of by the municipality, which could be dangerous to those waste handlers, as well as the public, depending on where it ends up.	NSI waste needs to be disposed of safely, as with sharps waste.
Disposal frequency	In 38% of outlets, NSI waste was reported to leave the outlet at least once a day, compared to 35% (84% in Mugu) reporting once a week or less often.	In over one-third of outlets, but 84% in Mugu, NSI waste is disposed of once a week or less often.	NSI waste should be disposed of at least once a week.
General waste			

Topic	Findings	Conclusions	Recommendations : intervention should
Quantity of general waste generated per week	The median of 2.5 bins of general waste was generated per week per outlet- ranging from 1 in Mugu to 3 in the other districts. The maximum ranged from 2 bins in Mugu to 10 bins in Sunsari. The minimum was .5 in Mugu to 1 bin in the other districts.	Outlets are generating between 1 and 10 bins of general waste per week.	
Separation	In 59% the outlets, general waste was seen to be separated from other waste. This ranges from a low of 40% in Syangja to a high of 75% in Mugu.	While most outlets appear to be separating general waste, some, the majority of outlets in Syangja and a significant minority in the other districts are not.	Outlets need to do a better job of segregating waste.
Where general waste kept	Most outlets (80%) kept general waste in a box/carton without a plastic bag, followed by 13% which used bins without plastic bags. Of those using bins, the main color used, as with NSI wastes was blue or green.		
Condition of general waste containers	In about half of the outlets where containers with general waste were in common areas, at least some of the containers did not have all waste neatly contained with the container.	General waste is not always kept within containers.	
Storage of full containers	While almost all were kept away from public access, about 20% of outlets in had full general waste containers in public areas.	Full containers of general waste were not always kept away from the public and were generally not closed.	All waste containers should be kept away from public areas, and closed, with waste completely contained inside to minimize

Topic	Findings	Conclusions	Recommendations : intervention should
	In only a few outlets were all the full containers closed.		infection possibilities.
Disposal method	The two main methods for disposal of general waste were burning (58%; 40% on the ground and 19% in pit/enclosure) and municipality/VDC (41%, 0% in Mugu).	Most outlets reported burning general waste or have it picked up by the municipality/VDC.	
Disposal frequency	In 38% of outlets, general waste was reported to leave the outlet at least once a day, compared to 34% (50% in Mugu) reporting once a week or less often.	In over one-third of outlets, but 50% in Mugu, general waste is disposed of once a week or less often.	Given the amount of general waste generated, disposal should occur at least weekly.
Waste outside outlets			
Containers outside outlet	In 38% of outlets (50% in Sunsari) waste containers were seen outside the outlet, 95% of which only had one container, which were mainly cartons. In almost all cases, these containers were self-contained and orderly, but in 14% (mostly in Sunsari) of outlets with containers outside were not self-contained.		
Contents of containers	7% of outlets with waste outside had containers including NSI waste and 5% had mixed waste; the rest contained general waste.	A small proportion of outlets had NSI and mixed waste in containers outside the outlet, posing an infection risk to the greater community.	Sharps and NSI waste should be kept inside outlets only in safe area.
Equipment, Materials, Cleanliness and Resources			
PPEs	Only 26% of outlets had light gloves visible to the data collectors, the PPE with the highest	Low levels of PPEs visible or used during visit of data collector. Higher levels available,	Explain and demonstrate importance to their safety of PPEs during training and supervision.

Topic	Findings	Conclusions	Recommendations : intervention should
	<p>availability. During the visit of data collector few of those visible were used.</p> <p>However, almost two-thirds said they had light gloves available, followed by 44% reporting availability of masks, 33% of heavy duty gloves and 25% aprons.</p> <p>71% of outlets said they buy PPE themselves and the remainder said they don't use any.</p>	<p>but not visible – especially of gloves, masks and aprons.</p> <p>However 29% (45% in Sunsari) said they don't use any PPEs. The remainder buy it themselves.</p>	<p>Consider supplying some of the more durable/resuable ones, such as aprons, which can help prevent infection while administering injections.</p>
Guidelines, job aids, BCC materials	<p>In only four of the 110 outlets were any printed materials present and none specifically related to waste management.</p> <p>One was a poster demonstrating handwashing, which is relevant to infection prevention.</p>	<p>No guidelines, job aids or BCC materials on the topic of waste handling were available in any of the outlets.</p>	<p>Develop HCWM guidelines for Sangini outlets and provide job aids/BCC materials to remind providers about the importance of safe handling of sharps, segregating and safe disposal of sharps and NSI wastes. This information should also be included in training and supervisory visits.</p>
Cleanliness in and around the outlet	<p>In about three-fourths of the outlets in Sunsari and Syangja, the floors of the injection areas were all clean and in the rest, some were clean. In Mugu, the situation was reversed.</p> <p>The same held for cleanliness outside the outlets.</p>	<p>Generally Sunsari and Syangja outlets had fairly clean floors in injection areas as well as outside the outlets. This was not the case for Mugu.</p>	<p>Determine how to improve cleanliness inside and outside the outlets, especially in Mugu.</p>
Water, presence and type of source.	<p>Almost all outlets had water available (4 in Syangja had none), with almost half having a tap with running water and the rest was carried in</p>	<p>Virtually all outlets (except for 4 in Syangja) had water available.</p> <p>About 30% used buckets with no tap, which means they need</p>	<p>Consider supplying buckets with taps to those outlets using buckets with no taps, to decrease risk of infection.</p>

Topic	Findings	Conclusions	Recommendations : intervention should
	from outside. Somewhat more than half of the outlets which carried in water put it in a bucket with no tap.	to dip into the bucket which is not sanitary.	
Electricity and generators	Virtually all outlets in Syangja and Sunsari had electricity, but only half in Mugu did. Only 11% of outlets had generators.	Half of the outlets in Mugu did not have electricity.	
Providers' Perceptions, Injuries and Medical Protection			
Concern about infection from injection equipment	95% of providers said they were very concerned about getting an infection from injection equipment.	Virtually all providers are concerned about getting infected from injection equipment	Without making providers scared, use this concern to motivate safer injection and waste handling practices.
Awareness of diseases transmissible through injection equipment	All providers knew they could get HIV/AIDS from a used needle and 91% mentioned Hepatitis B. 46% mentioned Hepatitis C and 41% mentioned tetanus.	Same as finding	Provide more information about possibility of tetanus and encourage them to make sure they're up to date on their Hepatitis B and tetanus immunizations, to avoid those diseases.
Source of knowledge on waste management	Over 90% of providers said they had had either Sangini or in-service training on the HCWM at some point. Other sources of information come from media, materials and other health staff. Only about one-third of providers mentioned pre-service training, which ranged from 100% in Mugu to 69% in Syangja to 9% in Sunsari.	Same	Develop module to include in pre-service training for all Certified Medical Assistants.
Recency of last training on HCWM	Less than one-fourth (but 83% in Mugu) said the most recent training		Provide updated training, starting with those who have not received

Topic	Findings	Conclusions	Recommendations : intervention should
	received was in the last two years. In Mugu the median for most recent training was 18 months ago, compared to 2 years in Syangja and 5 years in Sunsari.		recently. Highest need in Sunsari, followed by Syangja.
Relationship of recent training with protective behaviors	Those reporting HCWM training in the last 2 years were significantly more likely than others to practice protective behaviors including: not disposing of sharps waste via municipal vehicles (90%), burning non-sharps infectious waste in a pit or enclosure (90%), and never recapping (95%). In addition, the field teams observed that outlets with providers who had received training in last two years were significantly more likely (90%) than others to dispose of sharps waste in safety boxes.	Those reporting HCWM training in the last 2 years were significantly more likely than others to practice protective behaviors	Same as above
Issues related to waste management	Providers gave multiple answers when asked what issues they had. The lack of an incinerator topped the issues (57%), followed by the lack/shortage of safety boxes (53%), lack of land area for burial (49%), and lack of fuel (33%).	same	Address disposal and supplies issues
Suggestions for improving HCWM	Providers similar gave multiple suggestions, which group together into categories of supplies/equipment, disposal and	Same	Provide more ongoing and more focused training and supervision along with improved disposal solutions and regular adequate supplies

Topic	Findings	Conclusions	Recommendations : intervention should
	training/monitoring.		
Injuries and treatment	Twenty percent of providers reported ever having a needle stick, with 32% of these in the last year. Among the 9 with needle sticks in the last year, only 50% received PEP.	Same	Provide information (during training and a referral card) to encourage Sangini providers to access PEP in case of need.
Vaccinations	Only 56% had ever received an Hepatitis B vaccine, with only 72% of those receiving at least the necessary 3 injections. Virtually all providers received Tetanus vaccines. However, 16% received them more than 10 years ago and are therefore likely to be not protected any longer.	Same	Provide information (during training and a referral card) to encourage Sangini providers to get all three Hepatitis B doses as well as Tetanus boosters every 10 years.