ADDIS ABABA UNIVERSITY SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF HEALTH RISK PROTECTION BEHAVIORS AMONG SOLID WASTE COLLECTORS IN ADDIS ABABA, ETHIOPIA

BY

MOLLA MEKASHAW (BSc.)

ADVISORS:

Mulugeta Tamrie (BSc,MPH)

Demeke Assefa (MD, MA)

A THESIS SUBMITTED TO SCHOOL OF GRATUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FUFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH

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Approved by Examining Board

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List of Acronyms and Abbreviations

AAU	Addis Ababa University
ETB	Ethiopian Birr
HRPB	Health Risk Protection Behavior
KAP	Knowledge, Attitude and Practice
Occ. H	Occupational Health
PHS	Periodic Health Survey
PI	Principal Investigator
PPE	Personal Protective Equipment
REC	Research Ethics Committee
SSE	Small Scale Enterprise
SWC	Solid Waste Collectors
UHEP	Urban health extension program

Abstract

Introduction: *Solid waste collection is a daily task all over the world with significant variation in its amount and type. Waste is automatically regarded as the harbinger of disease and the bringer of illness. Inadequate understanding of magnitude of the problem & poor financial resources, occupational risk behaviors of waste collectors is major problems in most of developing countries. Ethiopia as one of the developing countries, municipal solid waste is collected manually and lifting, carrying, pulling, pushing, and loading it is a common task.*

Objective*: This study aimed at assessing health risk protection behaviors, knowledge, attitude and practice among solid waste collectors in Addis Ababa city.*

Method*: A cross sectional survey complemented by qualitative key in-depth interview was carried out among solid waste collectors working as home to home waste collectors under small scale enterprise unions at Addis Ababa city administration. Sample populations were selected using multi stage sampling technique. A total of 654 solid waste collectors and 2 woreda solid waste management heads and 3 supervisors were interviewed from February to March, 2015. Data was entered into a computer by using Epi-Info version 3.5.1and analyzed using SPSS version 20 for windows. Frequencies, means, tables and graphs were used to present data. Logistic regression analysis was used in order to identify the association between predictor variables and dependent variable and to control confounders. Thematic analysis using open code soft ware was used for qualitative data analysis.*

Result: *The response rate of this study was 98.2% and male respondent were 60.7%. The median age of the study subjects was 29 ranging from 18 to 68 years. Above half of SWC had low level of knowledge (52%) in term of alertness, positive attitude (53.7%) about health risk protection and inappropriate practice (55.5%) on prevention of infections, injury and disability. Training on occupational health safety were associated significantly with both frequently hand wash and wearing PPE during duty (AOR=2.41; 95% CI, 1.47-3.96 and AOR=1.77; 95% CI, 1.21-2.61) respectively. Lack of concern, addiction, carelessness, lack of PPE supply and nature of job were reasons mentioned for SWC health risk practice.*

Conclusion and Recommendation: *Health risk protection behavior among solid waste collectors in Addis Ababa city was inappropriate. Solid waste collectors should be packaged in health related programs to enhance their health care information and health service utilization. Training SWC about safety and provision of standardized PPE is highly recommended.*

Declaration

I, the undersigned, declare that this thesis is my original work and has never been presented in this or any other university and that all the recourses and materials used here in, have been fully acknowledged.

Name: Molla Mekashaw Setargew (BSc)

Signature: .....

Place Addis Ababa, Ethiopia

Date Submission: June 26, 2015

This thesis has been submitted for examination for my approval as university advisor.

Name: Mulugeta Tamrie (BSc.,MPH)

Signature: .....

1. INTRODUCTION

1.1 Back ground

Solid waste collection is a daily task all over the world with significant variation in its amount and type. Its health risk is currently global issue (1, 2). Solid waste collection workers and waste pickers handling solid waste throughout the world are exposed to occupational health and accident risks related to the content of the materials they are handling, emissions from those materials, and the equipment being used (1,3).Their job is the seventh most dangerous job in the world(1). Inadequate understanding of magnitude of the problem, poor financial resources and occupational risk behaviors of waste collectors are still largely unmanaged in most of developing countries (4). Regulatory framework that exists in most of middle and lower income countries for environmental protection and occupational health and safety is often not enforced. Waste collection is by labor intensive systems with little worker protection from direct contact and injury (1).

Economic standing is one primary determinant for amount and type of solid waste produced and the way how solid waste is collected (5). However, whatever the country is in different level of development, solid waste collectors are exposed to occupational health problems. But, the level of risk faced by for solid waste collectors (SWC) significantly varies across the globe. In high income countries, occupational risks are being substantially managed (6). Pollution control costs money, health care training and adherence to safe design standards requires a commitment to construction and operation supervision. In most developing countries this activities are challenged and occupational health risk remain unmanaged (1, 6).

In developing countries especially in Africa and Asia, SWC have low socio-economic status and work with risk environment for hazardous substances from solid waste without adequate personal protection (7-9).

Ethiopia as one of the developing countries in its capital city Addis Ababa , municipal solid waste is collected manually. Neither pre-employment nor periodical medical checkups are accessible to this group of workers (3). Therefore, this study was designed to investigate health risk protection behaviors; knowledge, attitude and practice (KAP) of SWC for health risk protection. It would be important to insight behavioral aspects of solid waste collectors and to design intervention programs.

1.2 Statement of the Problem

Solid wastes do not exist in isolation of human beings. They are created by every person, then collected, carried, treated, recycled and disposed of by others (10). Solid waste management becomes global task and environmental issue. Solid waste collectors are the main actors for this activity. They work in filthy environment (6). As it has an image problem, it is also automatically regarded as the harbinger of disease and the bringer of illness (10). A study in Nigeria explained that SWC are exposed for odors, dust, ants, flies and they get dirty easily even when they wear protective clothing during performing the above activities (11). Injury is also the highest prevalence among SWC compared with the general population (3, 12). Provision of personal protection, training, supervision, engineering controls, monitoring of exposures, education, and other interventions appears to be under-utilized in protecting waste handlers from exposure and health effects (4). Solid waste collectors may face risks higher than the expected. The socio-economic status of waste collectors is low and their working environments are unfavorable. However, only few researches have done on this population group. Thus, the actual risk may be substantially reported (13).

It is clearly observed most of Ethiopian cities including in Addis Ababa, SWC manually transport to local storage sites, lift and dump containers (sacks and other local containers) into the vehicle(3). It is not well studied about health risks protection behaviors among solid waste collectors in Addis Ababa. A study in Thailand (2) showed most of scavengers have low level of knowledge in term of alertness, positive attitude about health risk and inappropriate practice on prevention of infections, injury and disability.

Because of the filthy environment they assigned, they may develop anxiety or new behavior like smoking (6, 14).

1.3 Rationale of the Study

Solid waste collectors are probably most marginalized and exposed for hazards in Addis Ababa related with private union house to house waste collection system started in recent time. Difficult health problems solid waste collectors' face and how they overcome or responses to these problems are not well studied. Both positive and negative behavior investigation to health risk protection is important to design intervention packages accordingly. It is important to describe health risk protection behaviors among domestic waste collectors so that an intervention packages could be developed to reduce the exposure and hence to prevent the occurrence of adverse health effects (15). Assessing knowledge prior to testing performance of a complex task has the advantage of detecting and identifying knowledge deficiencies before they are revealed by errors in performance or other near-accident incidents (16).

2. LITERATURE REVIEW

2.1 Occupational health risks

Globally, solid waste collection is an important task and among the highest risk occupation. It is the removal of municipal solid waste with variety of biological, chemical, mechanical, physical and psychosocial hazards (17). SWC are under risk of one or more of these hazards. Solid waste workers are exposed to bio aerosols while collecting household waste and further down-stream in the waste treatment process (18).

Commonly observed health problems among SWC include respiratory systems, irritation of the skin, nose and eyes, gastro-intestinal problems, fatigue, headaches, psychological problems, allergies, chemical poisoning, tuberculosis, scabies, asthma, ophthalmic diseases, ulcer, stomach problems, musculoskeletal and dermal injuries (1,7, 19-21).

A study in Delhi explained Waste pickers, scavengers, or rag pickers remain most vulnerable in the urban society. Almost all the waste pickers interviewed collect waste on a daily basis and 85% said that they had no option but to do so as it was their only source of livelihood. In the hope of discovering some saleable item the waste pickers rummage through putrefying waste heaps including toxic medical waste using their bare hands and feet and hence come in direct contact with waste material. Infections and infestations result due to such contact with human and animal excreta, sputum, dead animals and potentially infectious hospital waste dumped in refuse dumps. This makes them highly susceptible to a number of health hazards (7). Similar trend is observed in Addis Ababa SWC. They rummage through putrefying waste heaps using their bare hands to search saleable materials like metals and high land plastics.

In Addis Ababa, most of house hold wastes stored in a sack or open baskets without separation of by type and composition(3). It is synonyms of Accra low income households solid waste storage system. They stored high organic content solid wastes in

open baskets and any available cans that attract flies and other organisms which posed health problems (3, 22).

There are different reasons why poorer countries have SWC exposed for greater occupational risks. To mention some collection is by labor-intensive systems; workers have less protection, most waste is not safely contained in readily lift able load sizes, recycling are conducted from mixed waste rather than from segregated materials at source, disposal is by open dumping, disposal equipment operators are not in closed air conditioned cabs (1, 4).

2.2 **Health care service utilization**

Health care information transmission and health care service provision for SWC tied with different factors. The relationship between exposure to solid waste and increased health risk is greatest where the contact between the solid waste worker and waste is greatest and the level of protection least (1). Occasional exposure to significant infection risks may occur wherever workers have direct contact with wastes, for example, on picking lines or during cleaning and maintenance (23) whereas injury occur when absence of safety training, limited use of personal protective equipment while on duty and prolonged duration of working hours (3). As the problem is related with so many factors, it seems difficult to quantify and list all solutions for the problems. For example there was a study in Netherlands about effect of job rotation on need for recovery from musculoskeletal complaints. Unfortunately, that study remained inconclusive as to whether job rotation between collecting two-wheeled containers and truck driving is an (in) effective measure (24). It is also difficult to recommend specific health care services for SWC. To mention one, there have been few studies on the sero-prevalence of vaccine-preventable diseases in solid waste workers. So, it is difficult to provide clear guidance to workers and employees regarding vaccinations (8)

The domestic waste collectors had significantly lower education level compared to office workers (14). In some countries like Thailand accessibility to health care facilities is 100 %. However, health care service utilization including Thailand is low (2). The poor

hygienic behaviors and poor socio economic conditions, consuming alcohol and slum dwellers aggravate risk of morbidities (4). Even though the causative agent is different, SWC need to be informed about the risk so that the condition will not get worse (14).

2.3 Knowledge, attitude and practice

The knowledge of people greatly affects the safety, effectiveness, comfort and satisfaction with which the goals of an individual is formulated and attained (16). Most of SWC or scavengers had low level of knowledge in term of alertness, positive attitude about health risk and inappropriate practice on prevention of infections, injury, disability and Around 67% of the respondents had their food and drinking water within the dump sites compound(2). Knowledge provides an orderliness to our lives which allows us to conceptualize goals, to anticipate and perceive events, and to respond in accordance with the changing needs, purposes and desires. An individual's behavior and performance depend both on the knowledge that has been acquired through learning, practice and experience *(16).*

The risk to worker health should be small but occasional exposure to significant infection risks may occur wherever workers have direct contact with wastes, for example, on picking lines or during cleaning and carrying (23).

To change the KAP of waste collectors positively and to analysis the situation of their health in general periodic health surveillance (PHS) for waste collectors is very important. For example PHS had been developed in the Netherlands to detect early signs of work related disease and to monitor the work ability of the refuse collector on a regular basis. The PHS usually consist of a questionnaire concerning work ability, work demands, occupational hazards, and related health complaints ; general health tests such as tests for measuring the pulmonary function, blood pressure, hearing, seeing and specific tests to measure the physical workload of waste collectors (24).

2.4 Reinforcing health risk behaviors

Enabling risk factors are essential to describe health risk protection behavior among solid waste collectors (4). To list some, risky and unhygienic sorting of waste, alcohol consuming, smoking, insufficient night sleep and workers working empty stomach (without having food like breakfast, lunch) are poor health risk protection behaviors (4, 25). Another issue is job satisfaction. Many people spend a considerable period of time at work. If their work is failing to provide satisfaction, they are likely to feel unhappy or unfulfilled for most of the day, resulting in poor general mood and decreased feelings of self-worth. Satisfaction with colleagues, task variety, and working conditions were significantly ($p < 0.01$) related to overall job satisfaction (26, 27)

2.5 Conceptual framework

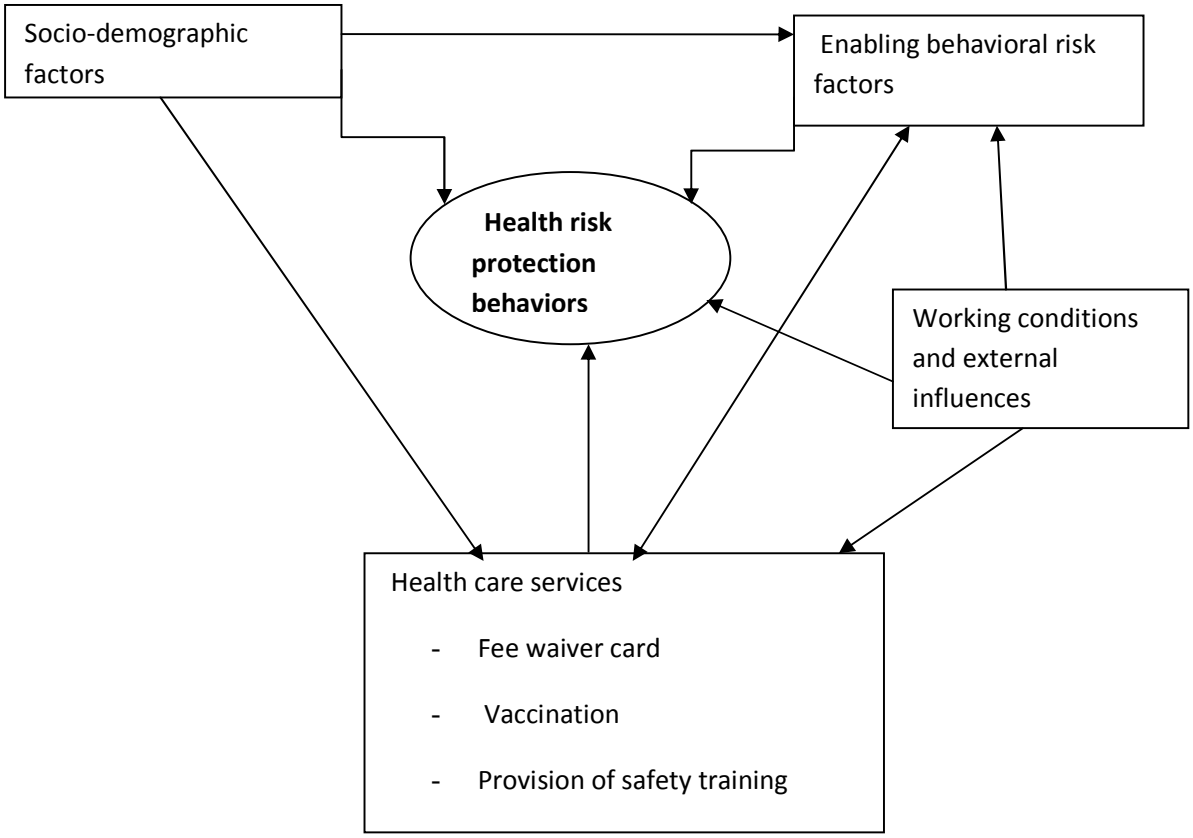


Figure 1: Conceptual framework of health risk protection behaviors

3. OBJECTIVE

3.1 General Objective:

To assess health risk protection behaviors among solid waste collectors in Addis Ababa city

3.2 Specific objectives

- To assess knowledge of Addis Ababa city solid waste collectors on waste hazards and risks
- To describe the attitude of Addis Ababa city solid waste collectors towards health risk protection
- To determine the practice of Addis Ababa city solid waste collectors to prevent health risks.
- To assess factors associated with health risk protection behavior

4. METHODOLOGY

4.1 Study Area and period

The study was conducted in Addis Ababa, capital city of Ethiopia. Ethiopian demographic census (2007) showed that Addis Ababa has around 3 million total population and 540 square kilometer total area coverage. It is located 2500 meter above sea level. It is the largest city administration structure in Ethiopia with ten sub cities which have 113 the lowest administrative units. Currently, house to house solid waste collection is a source of income (3) in the city. During study period there were 604 small enterprises organized under Addis Ababa city solid waste management and recycling project office (personal communication) which have 6138 solid waste collector members. This study was carried out from February to March 2015.

4.2 Study Design

A cross sectional quantitative design complemented with qualitative design were employed to answer the objectives of this study.

4.3 Source Population

All Addis Ababa city solid waste collectors that were organized under house hold solid waste collector unions were the source population of this study.

4.4 Study population

Solid waste collectors working in randomly selected sub cities (Nifas Silk Lafto and Kirkos sub cities) were the study population for quantitative while their management heads or supervisors were also part of this study for the qualitative.

Inclusion criteria

Every workers in the selection unions and purposely selected their heads or supervisors who had a minimum of one year experience in solid waste collection and management respectively were included in this study.

Exclusion criteria

All study units who could not speak and hear (damp and deaf) and those who had less than one year experience in the field were excluded in this study. Minimum of one year experience was required for the reason for both solid waste collectors and management heads (supervisors). Solid waste collectors may not develop appropriate or inappropriate behaviors within short period of time. The purpose of one year experience required for office heads/supervisors was to get sufficient information about the issue from their experiences.

4.5 Sample Size Determination

Quantitative part

Sample size was determined using the formula for estimating single population proportion and, because of absence of previous study on risk protection behavior of solid waste collectors in the nation, assumed 50% of solid waste collectors had knowledge on waste hazards and risks. Ten percent non response rate was added, and multiplied by the design effect of 2 due to the multi stage nature of sampling method.

$$n = (Z_{a/2})^2 \frac{p(1-p)}{d2}$$

The following assumptions were taken to obtain sample size

- p= assumed proportion of awarded of solid waste collectors
- Z= standard score at level of 0.05 is 1.96
- d= the margin of error taken 0.05

After the above formula sample size was (n) = 384, from undefined population. Then for defined population would be calculated:

$$n = \frac{n_o}{\left(1 + \frac{n_o}{N}\right)}$$ where n_o, sample size from an infinite population

N =finite population size

$$n = \frac{384}{1 + \frac{384}{1436}} = 303$$

Total sample size was 303+30 (10% non response rate)= 333, and considering the design effect of 2x333=**666**

Qualitative Part

Five purposely selected lowest administrative unit solid waste management office heads /supervisors were part of the study.

4.6 Sampling Procedure

Quantitative

Multi- stage random sampling method was used for the selection of study participants. Two sub cities (Nifas Silk Lafto and Kirkos) were selected using lottery method. They have different number of unions organized under small scale enterprises. To avoid selection bias sampling unit are selected proportionally and randomly from the total unions in the two sub cities. On average, each union had 10 members. Therefore from the total 137 unions in the two sub cities, 67 unions were selected proportionally but randomly. In the selected unions, 654 members were participants of this study.

Qualitative

All qualitative study participants were in the selected sub cities as its objective is complementing the quantitative findings. Using purposive sampling technique five solid waste collectors' management office heads (supervisors) were selected based on their experience and knowledge on waste collectors practice for in depth interview.

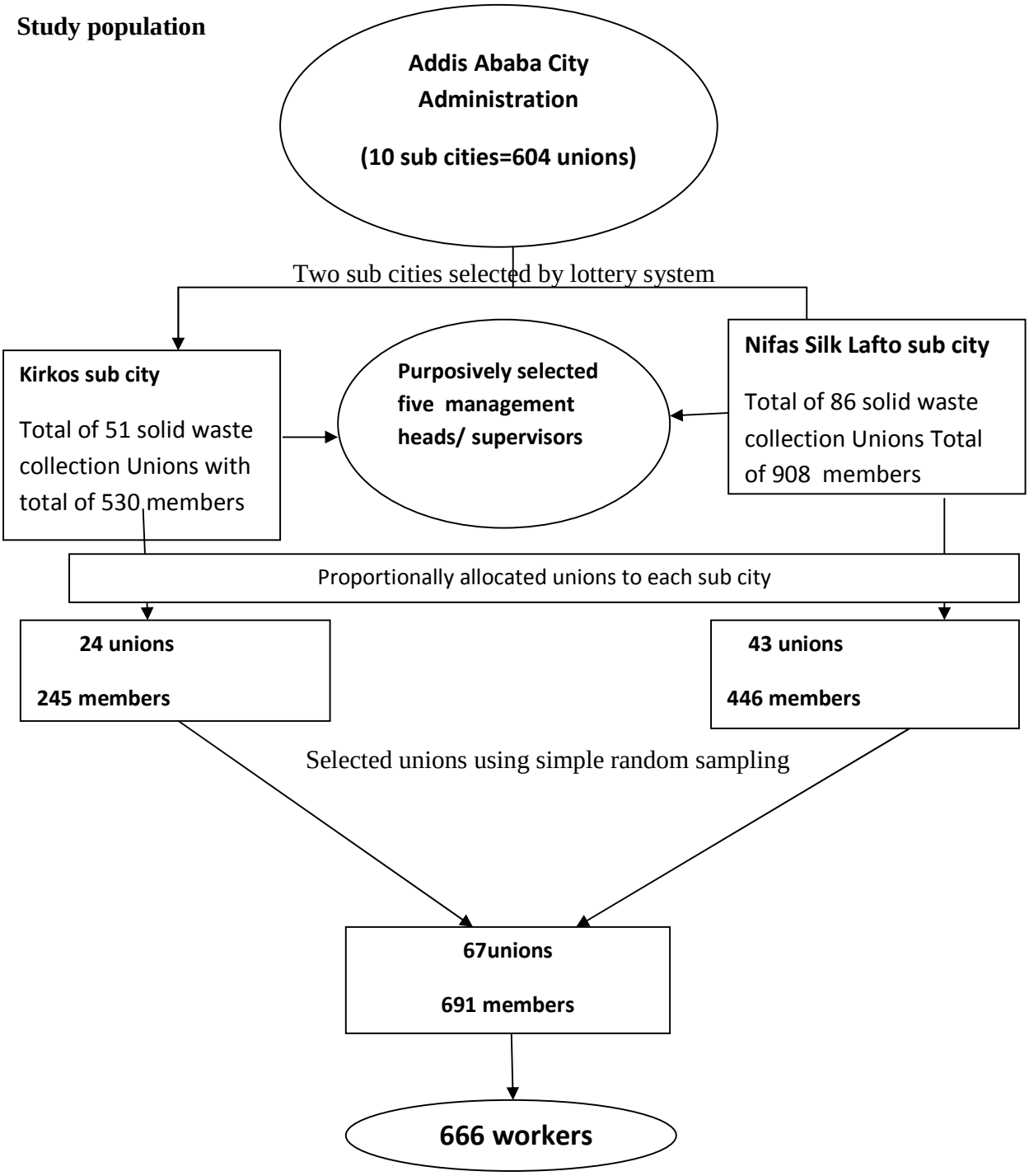


Figure 2. Schematic presentation of sampling procedure

4.7 Data collection tools and procedures

Structured questionnaire for quantitative and semi structure guide for qualitative tools were used for this study. The questionnaires were prepared in English and then would be translated to Amharic and retranslated back to English to insure consistency. Pre test was conducted on Lideta sub city for validation of questionnaire 20 days prior to actual data collection. One day intensive training was given for supervisors and data collectors. Two bachelor science degree holders recruited as supervisor for quantitative data collectors' supervisor and interviewer for qualitative in depth interview. Six diploma health professionals collected the quantitative data on work site during data collection period.

4.8 Operational definitions

Health risk: the chance of solid waste collectors being harmed by hazard from solid waste, emission from solid waste and/or from equipment used for solid waste collection.

Health risk protection: in this study health risk protection means being free of from the chance of infection, injury and disability from solid waste or related to solid waste collection tasks.

Health risk protection behavior: Solid waste collectors' health risk protection desires and practices to prevent health problems related from their job.

Knowledge: awareness of solid waste collectors about health risk protection to prevent infection, injury and disability.

Attitude: positive or negative belief towards health risk protection.

Practice: the action/behavior of solid waste collectors including appropriate personal hygiene and use of PPE to prevent infection, injury and disability during their working time. Practices or behaviors are the observable actions of an individual in response to a stimulus. This is something that deals with the concrete, with actions (28).

Fee waiver service: system of health care service that the government covers any medical expense in any governmental health care institutions for locally identified poor.

Health care service: in this study can be program package, training, vaccination, treatment or financial support for the goal SWC health care.

Reinforcing health risk behaviors: any factors that assumed increase the probability of health risk.

Hand wash before… : hand wash before is considered from any specified event in this study to see solid waste collectors hand wash habit towards prevention of contamination from waste.

4.9 Study variables

Dependent variables

Health risk protection behavior

Independent variables

Socio demographic factors
Reinforcing risk behaviors: smoking, alcohol drinking
Health care services: provision of safety training, vaccination, having fee waiver card
Working environment

4.10 Data processing and management

To ensure the generalization of the study, appropriate sample size and representative type of study units were selected, and to ensure the internal validity of the study, appropriate study design, sampling, questionnaire development, data collection, data entry and data analysis was applied to minimize bias and errors. Data was coded and checked for completeness every day by supervisors and principal investigator during data collection. Any incomplete information was excluded from entry. Data was entered into Epi Info version 3.5.1 computer software package and exported to SPSS version 20 for analysis. Before analysis, cleaning was made to avoid missing values, outliers and other inconsistencies using commands like sort, cross tabulation and frequency.

4.11 Data analysis

Quantitative

Descriptive statics (mean, medians, frequencies and percentages) of variables were computed to describe the data. Then bi variate and multivariate analysis were done to see the association between independent variables with health risk protection behavior.

Qualitative

Qualitative data was transcribed and translated from Amharic to English language. Word document was imported to open code soft ware and coded. Codes were categorized then interpreted using thematic qualitative data analysis method.

4.12 Data quality assurance

Quantitative

After reviewing of the relevant literature, the questionnaire adapted and modified as appropriate to address the study objectives. It was pre-tested for consistency of responses on 5% of the total sample size SWC (in Lideta sub city) who were not included in the main survey having common socio-demographic characteristics with the samples to ensure its validity. Six data collectors and two supervisors were trained for two days before data collection period. The completeness and quality of quantitative data was checked by trained supervisors every day. The overall supervision was done by principal investigator. Feed backs were given continuously throughout data collection period.

Qualitative

An in-depth interview was conducted with purposively selected five SWC heads and supervisors who had better knowledge and experience in the field. *It* was recorded using digital camera and mobile phone. One in-depth interview was conducted per day and transcribed over night. Qualitative data was used to complement the quantitative study to widen our insights about SWC health risk protection behavior. Then, the findings were summarized and compared with quantitative finding. Finally, the managers' information about SWC health risk protection behavior was determined.

4.13 Ethical consideration

Prior to data collection, ethical clearance was obtained from Addis Ababa University College of Health Sciences Ethical Committee. Formal letter was written to Nifas Silk Lafto and Kirkos sub cities Solid Waste Management Offices and these offices then wrote a letter to all districts under them. Objective and benefit of the study were explained by data collectors before data collection. The information sheet and consent form were provided for respondents to read (hear) for those who can read and for those who cannot read interviewer read the paper respectively. Finally, he or she was asked for his or her willingness to participate in the study. Confidentiality was maintained by omitting respondents' name and personal identification.

4.14 Dissemination of result

The result of this study will be disseminated or/and communicated to Addis Ababa University School of Public Health and Addis Ababa City Solid Waste Management and Recycling Project Office.

5. RESULT

5.1 Socio-demographic characteristics

Six hundred fifty four solid waste collectors participated in the study with 98.2% response rate. Non respondents were only those who were absent from work at the time of data collection and not presented on the second re visit. The majority of the respondents were males (60.7%). Mean age of the respondents was 30.56 (SD 7.57) and the median age was 29 with minimum age 18 to maximum age of 68 years. The largest percent of the respondents were in the age group of 26-35 (58.3%) in which male accounts 61.2%. From the total respondent married respondent were dominant (47.9%). The majorities 379 (58%) learn primary education while illiterates were 10.9% with female score highest percentage (67.6%).

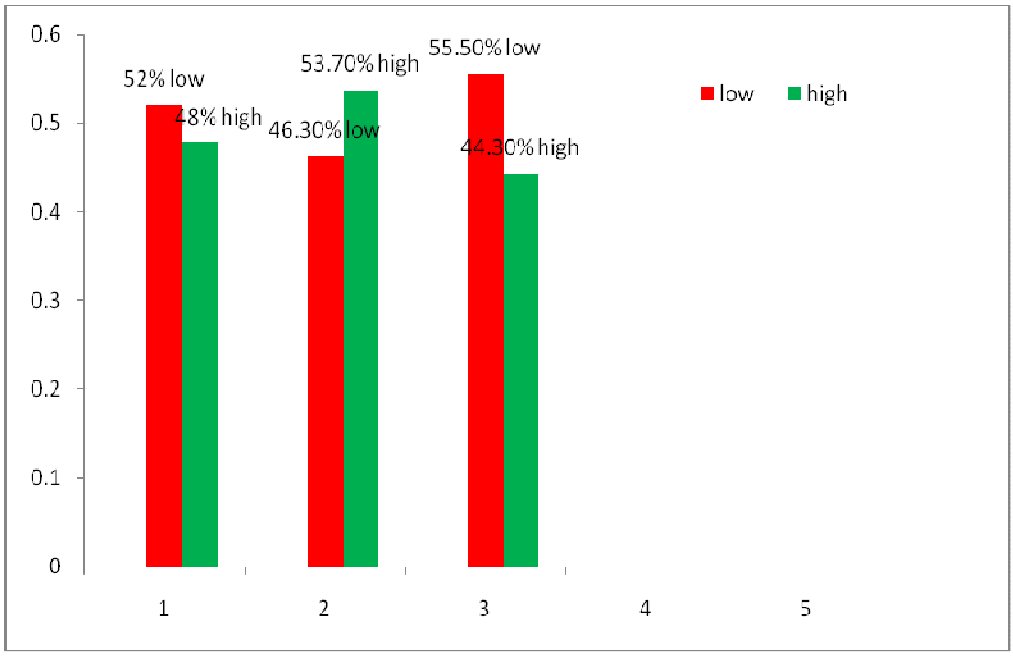
Majority of respondent working experience, working day per week and working hour per day were <5 years (52.3%), 7 days (68.7%) and <=8 hours (80.1%) respectively. The median monthly salary for the survey respondents was 1200 ETB with range of 600 to 2500 ETB. Few respondents (6.7%) reported that they had additional job range from 50 ETB to 1000 ETB.

Table 1: Socio-demographic characteristics of Addis Ababa city solid waste collectors, March 2015

Characteristics	Frequency (n=654)	Percent
Sex		
Male	397	60.7
Female	257	39.3
Age in years		
≤25	158	24.2
26-35	381	58.3
36-45	86	13.1
≥46	29	4.4
Marital status		
Married	313	47.9
Single	253	38.7
Separated/divorced	67	10.2
Widowed	21	3.2
Educational status		
Illiterate	71	10.9
Read and write	118	18.0
Primary (grade1-8)	379	58.0
Secondary (grade 9-12)	80	12.2
College (above grade 12)	6	0.9
Family size		
Two and less	275	42.0
Three to four	319	48.8
Five and above	60	9.2
Monthly salary (ETB)		
<800	123	18.8
800-1600	459	70.2
>1600	72	11.0

5.2 Knowledge, Attitude and Practice

To determine KAP of solid waste collectors mean of score was used as cut of point**.** The level of knowledge participants score were low (below mean score) 340(52%) and high (above mean score) 314(48%). Solid waste collectors' attitude was positive (high) 351(53.7%) and negative (low) 303(46.3%) towards health risk protection. Poor (low) practice and good (high) practice towards health risk protection score were 363 (55.5%) and 290(44.3%) respectively. Inappropriate practice on prevention of physical damage and bad practice towards health risk prevention like infection prevention were considerable.



Low= respondents response were below mean score for knowledge, attitude and practice

High= respondents response were above mean score for knowledge, attitude and practice

Figure 3: Level of Knowledge, Attitude and Practice of Addis Ababa SWC, March 2015

5.3 Risk protection behavior

Above three-fourth of SWC (77.8%) washed their hands at least in one of the following conditions; before eating food (72.5%), if hand become contaminated (54.9%), before toilet use (before…is asked which aimed only to see SWC risk protection habit from their job), before drinking water and/or before wearing glove (34.3%) and before using cell phone and/ or before smoking (12.5%). Of the total respondents, 61.8% wore one or more personal protective equipment from which (50.3%) wore gown.

Table 2: Health risk protection behavior among SWC in Addis Ababa, March, 2015

Characteristics		**Frequency (n=654)**	**Percentage**
Wash hands frequently with soap	**Yes**	**509**	**77.9**
	No	**145**	**22.1**
Before eating food	Yes	474	72.5
	No	180	27.5
If hand become contaminated	Yes	359	54.9
	No	295	45.1
Beforetoilet, drinking water, wearing glove	Yes	224	34.3
	No	430	65.7
Before using cell phone ,smoking	Yes	82	12.5
	No	572	87.5
Wearing PPE during duty	**Yes**	**404**	**61.8**
	No	**250**	**38.2**
Glove	Yes	320	48.9
	No	334	51.9
Gown	Yes	329	50.3
	No	325	49.7
Goggle	Yes	52	8
	No	602	92
Mask	Yes	68	10.4
	No	586	89.6
Hat	Yes	273	41.7
	No	381	58.3
Boot	Yes	147	22.5
	No	507	77.8

5.4 Substance abuse and other problems

Suspected reinforcing factors for risk behavior such as substance abuse and violence were assessed in this study. Above half of solid waste collectors (51.5%) chew chat, almost equal number of respondents (41.3%, 41.1%) reported smoke and drink alcohol respectively. Majority of respondents (53.5%) faced violence and 36.5% had sleeping disorder

Table 3: Substance abuse and other problems among SWC in Addis Ababa, March, 2015

Characteristics		**Frequency (n=654)**	**Percentage**
Smoking cigarette	Yes	270	41.3
	No	384	58.7
Drinking alcohol	Yes	269	41.1
	No	385	58.9
Chat chewing	Yes	337	51.5
	No	317	48.5
Violence	Yes	350	53.5
	No	304	46.5
Sleeping disorder	Yes	239	36.5
	No	415	63.5

5.5 Health care service utilization

Urban health extension program service was implemented for all citizens in Addis Ababa city, in 2010. It was planned for five years to complete the first phase and during this study period it was at the end phase by addressing all households but only 25.1% SWC

trained and graduated as model family. The respondents also asked whether or not trained occupational safety, had fee waiver service card, vaccinated tetanus and replied “yes” were 46%, 21.3%, 23.2% respectively.

Table 4: Health care information and service utilization of SWC in Addis Ababa, March 2015

Characteristics		Frequency (n=654)	Percentage
Graduate UHEP as model family	Yes	164	25.1
	No	490	74.9
Training any occupational safety in the last 12 months	Yes	301	46
	No	353	54
Had fee waiver service card	Yes	139	21.3
	No	515	78.7
Vaccinated tetanus	Yes	152	23.2
	No	502	76.8

5.6 Working conditions

Working conditions of SWC like access to staff room (12.9%), safe drinking water around their working area (19.1%), bathroom/shower (7%) and dressing rooms (7.5%) were asked irrespective of ownership.

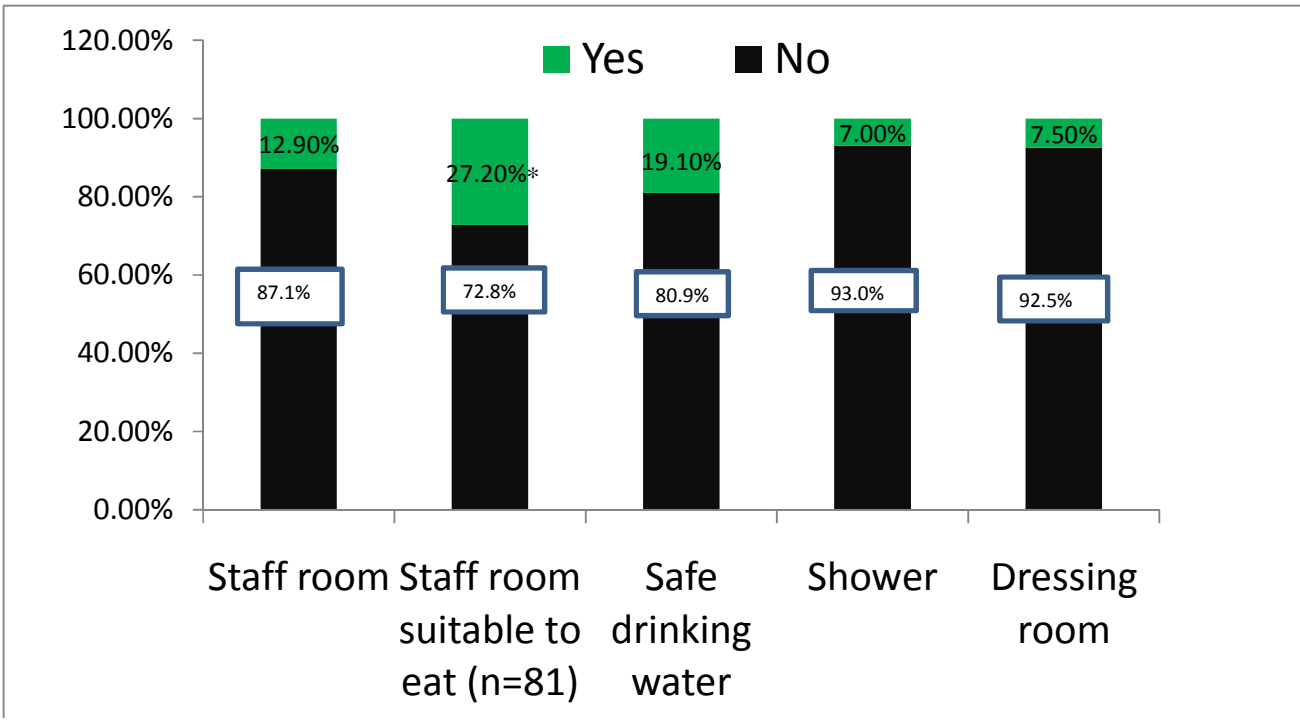


Figure 4 Working area facilities for SWC in Addis Ababa, March 2015 (n=654 except *)

5.7 Factors associated with frequently hand wash

Variables which were associated with hand wash in the bi-variate analysis were entered in to multivariate analysis to control for confounder and to come up with the major predictors for frequently hand wash. Both P-value <0.2 and significance CRO with 95% CI were considered in bivariate analysis to pass a variable for multivariate analysis. In multi variate analysis, the variables which were significantly associated (p-value <0.005) less likely with frequently hand wash were work experience ≤4 years (AOR=0.38; 95% CI, 0.24-0.61), violence on work place (AOR=0 .38, 95% CI; 0.23-0.62) and sleeping disorder (AOR=0.48, 95% CI; 0.30-0.76). Low working hour per day (≤8hour) have increased 2.53 times more likely hand wash behavior (AOR=2.53; 95% CI, 1.48-4.33). Training on occupational health safety also significantly associated with frequently hand wash behavior (AOR=2.41; 95% CI, 1.47-3.96).

Table 5: Multivariable association between frequently hand wash and other independent variables, Addis Ababa, March 2015

Variables		Wash hand frequently		COR with 95% CI	AOR with 95%CI	P-value
		Yes	No			
Work experience	≤4 years	253	89	0.61(0.42-0.89)	0.38(0.24-0.61)	<0.001
	≥5 years	256	55	1.00	1.00	
Working hour	≤8	431	92	3.12 (2.06-4.74)	2.53(1.48-4.33)	0.001
	>8	78	52	1.00	1.00	
Smoke	Yes	174	96	0.26(0.18-0.38)	0.57(0.34-0.95) *	0.032
	No	335	48	1.00	1.00	
Drink alcohol	Yes	76	93	0.29(0.20-0.42)	0.52(0.31-0.88) *	0.016
	No	333	51	1.00	1.00	
Violence	Yes	246	103	0.37(0.25-0.56)	0 .38(0.23-0.62)	< 0.001
	No	263	41	1.00	1.00	
Sleeping disorder	Yes	160	79	0.38(0.26-0.55)	0.48(0.30-0.76)	0.002
	No	349	65	1.00	1.00	
Training on Occ.H	Yes	266	34	3.54(2.32-5.40)	2.41(1.47-3.96)	<0.001
	No	243	110	1.00	1.00	

***=** variables which were significant in bi-variable analysis but lost the associations in multivariate analysis

5.8 Factors associated with wearing PPE during duty

Variables which were associated with wearing PPE on duty in the bi-variate analysis were entered in to multivariate analysis again to see associated variables in multivariate analysis step. Working day (≤6 days per week) and training on occupational health safety were associated significantly (P-value <0.005) and more likely (AOR=7.51; 95% CI, 4.66-12.10 and AOR=1.77; 95% CI, 1.21-2.61) respectively with wearing PPE during working time. Training urban health extension program have increased 1.97 times wearing PPE during duty (AOR=1.97; 95% CI, 1.23-3.16). Whereas, chat chewing have decreased 0.40 times wearing PPE (AOR=0.40; 95% CI, 0.27-0.60).

Table 6: Multivariable association between wearing personal protective equipments during duty and other independent variables, Addis Ababa, March 2015

Variables		Wearing PPE during duty		COR with 95% CI	AOR with 95%CI	P-value
		Yes	No			
Working day	≤6 days	177	28	6.18(3.98-9.59)	7.51(4.66-12.10)	<0.001
	=7 days	227	222	1.00	1.00	
Trainings occ.H	Yes	216	85	2.23(1.61-3.09)	1.77(1.21-2.61)	0.004
	No	188	165	1.00	1.00	
UHEP trained	Yes	122	42	2.14(1.45-3.18)	1.97(1.23-3.16)	0.005
	No	282	208	1.00	1.00	
Chat chewing	Yes	167	170	0.33(0.24-0.46)	0.40(0.27-0.60)	<0.000
	No	237	80	1.00	1.00	

Result of Qualitative Data

Qualitative data was collected using in-depth interview with woreda heads and supervisors in Kirkos and Nifas Silk Lafto sub cities.

Back ground of SWC

Majority interviewee reflected some of SWC come from street life and all (five participants) stated that all SWC were jobless. They also stated that SWC have different odd behaviors which were difficult to manage even for team formation. All the interviewee explained that majority of SWC came from adult age to this job.

One of the interviewee from Kirkos sub city defines back ground of SWC as:

"SWC in our area (Kirkos sub city) are adult in age, majority come from street life, some are homeless even currently, almost half of them are addicted and act odd behaviors like fighting daily with others, talk alone and sleep on field."

Reasons and Behaviors

The main reasons that derive for risk action were lack of concern from management, addiction, Lack of PPE and nature of job. The interviewee also mentioned that back ground of solid waste collectors, lack of access and quality of PPE have contribution for risk behaviors of solid waste collectors. Over load working and conflict also explained as pushing factor for risk action. The Theme, Categories and Codes of the results of qualitative analysis using open code are indicated in Table 7 and the results are then presented based on each category.

Table 7: The Theme, Categories and Codes of reasons of health risk behavior among SWC in Addis Ababa, Ethiopia 2015

Theme: SWC practiced health risk behavior because of lack of concern, addiction, carelessness, Lack of P supply and nature of job.					
Categories	Lack of concern	Addiction	Nature of job	Back ground of SWC	Lack of PPE
Codes	Role of management Administrative structure Lack of interest Adaptation of waste Being private union Lack of accountability	Carelessness Shortage of money Become addicted Unsafe feeding Conflict	Over load Lack of time Community influence Risk environment	Street life Before jobless Low care for risk	Lack of PPE supply Quality a discomfort issue Small number NGOs in the field

1 Lack of Concern (Table 7)

House to house solid waste collection in Addis Ababa was a private business under small scale enterprise (SSE) sector. Solid waste collectors organized in unions with minimum of 10 members and maximum of 15 members with their own leader in the member who is

responsible for SSE office and solid waste administrative office. Small scale interprise and solid waste administrative sectors are targeted to solve lack of job and manage solid waste respectively. All of the interviewee mentioned that they had no budget and plan for the concern of SWC health improvement. Because there is no concern or specific budget system from the government for SWC healths care services.

A supervisor from Kirkos sub city mentioned as:

"*Even though SWC are in high risk environment from other segment of community, they have minimum or no attention given for their health compared to other part of society. Even governmental health offices have no system to help SWC health risk minimization.*"

Another interviewee, woreda office head from Nifas Silk Lafto sub city stated as:

"…we only do awareness creation if we get support from private sectors unless our accountability is not based on according to health status of SWC".

2 Addictions (Table 7)

The interviewee repeatedly stated as half of SWC were addicted. They explained SWC chew chat, smoke cigarette and drink alcohol during duty.

One participant stated the condition as:

"*Their money management skill is poor because of addiction. They always drink traditional alcohol 'Areqi'(in Amharic) at the morning, and then after an hour they feed the collected food from house hold which might be poisoned and then chew chat and/or smoke cigarette on site. After some days they might not have money and suffer from depression. Conflict between them frequently happened especially among addicted and during this time."*

Some of the participant also mentioned that SWC addiction behavior leads them for waste adaptation and carelessness for care which expose SWC different dangers like infection, injury and disability.

3 Nature of job (Table 7)

Some of the interviewee explanation indicated that SWC accepted their job as it is means of bread and source of wealth. They always go out of home at 5:30 AM at the morning without breakfast and stay more than 8 hours on work. Their income is depending on the amount of waste collected so that, some SWC prefer to eat any food including food garbage ("bulle" in Amharic) on site.
An interviewee expressed his threat as:

"Solid waste collectors feed "bulle" because of the heaviness of their job and unpleasant odor of the waste. I personally afraid this habit which may expose them for different diseases".

The other from the same sub city said*:*

"… their income is based on the amount of collected waste, I observed they always think how much money they gained not what risk they faced. During my field visit I have commonly seen small blooding on SWC hand and other part of their body. But they do their tasks as nothing happen."

Another interviewee mentioned negative psychological influence from the community. He said:

"The community call solid waste collectors as 'qoshasha' (literal meaning waste) in order to command solid waste collectors to take their house hold waste which discourage solid waste collectors personality care"

4 Lack of PPE supply (Table 7)

Unless volunteer person or organization supports no responsible body to access complete PPE for SWC in Addis Ababa city. All of the interviewee explained SWC expected to

complete their own PPE by their pocket money. However, most of them could not and the managers communicated different organizations to full fill SWC need of PPE. One interviewee stated that problem:

"It is always difficult to get PPE supporter because there are only very small number of organizations in this area."

The other challenge stated is some SWC do not wear properly or ignore wearing PPE because of PPE quality and comfort issues.

6. DISCUSSION

Demographic characteristics information showed number of male involved in this job was higher (60.7%). Fifty two percent SWC score low level (below mean) of knowledge, 53.7% positive (above mean) attitude and inappropriate (55.5%) practice towards health risk protection from their job. Above quarter of SWC (27.5%) had no hand wash habit before eating food, about half of SWC (45.1%) did not wash even their contaminated hand, only 34.5%, 12.5% washed their hand frequently before (toilet use, drinking water, wearing glove) and before (using cell phone, smoking) respectively. From this survey, only one tenth (10.4%) SWC had experience of mask wearing. Generally PPE utilization (but not express completeness and standard) among SWC in Addis Ababa was (61.8%). Only 51.5% used tools to pick sharp materials and other danger wastes. The remaining picks those wastes using their hand (with or without glove).

High number of male engaged in solid waste collection in most countries throughout the world similar to the finding in this study (11, 25, 28, 29, 30,31) and indicate the nature of the job which mainly requires much physical effort like some factory tasks that are not safe for females.

Solid waste collectors in Addis Ababa had lack of awareness about health risk protection which was also observed in Thailand and Bangladesh (2, 30). Health risk protection practice was inappropriate which could reflect the current health image of SWC in Addis Ababa. Now a day, low health risk protection practices among solid waste collectors seems common findings throughout the world (11, 12, 30, 31).

Solid waste collectors working in house to house were exposed to multiple risk factors which could cause one or more issue of infection, injury and disability. On the other hand, risk protection behavior of SWC was found inappropriate. Above quarter of SWC had no hand wash habit before eating food, about half of SWC did not wash even their contaminated hand. Basic personal hygiene is one important practice to prevent risk. However, SWC, like rag pickers in India, did not take care of their health because of ignorance and poverty (6). Solid waste collectors working with empty stomach (without

having enough and nutritious food feeding) are highly in risk (4). Community biased attitude towards solid waste collectors was also visible. It might influences SWC moral setting towards them. The qualitative data revealed there are community members who call SWC by local language taboo word “Qoshasha” literal meaning waste when they went to their home for waste collection. It was studied which produce inferiority on SWC psychology (6, 11). The other reasons pushed SWC to unhygienic adaptation are carelessness, lack of time, back ground (street life) and inaccessibility of sanitation facilities (2, 21). Hand wash practice before eating (72.5%) and after contaminated (54.9%) in this study were lower than a study in Egypt 85.5% and 77.5% respectively. This could be the above problems or other factors might be higher in Addis Ababa. Working time <8 hour and training on occupational health were major enabling factors for frequently hand wash. While having less experience for the job, violence and sleeping disorder were contributing factor to the practice of unhygienic adaptation. Having less experience was not found negatively associated with hand wash in other study (31). In this study it could be connected with background of SWC (from qualitative data beginning from street life and unemployed status). Addictions such as smoking cigarette, chewing chat and drinking alcohol associated during bivariate analysis stage and lost association in the last multi variable analysis step. However, in other study, these three risk factors were identified as main psycho-social problem of SWC including for hygiene behaviors (3).

Domestic waste may contain broken glass, blade and sharp materials, needles and other e-waste materials. About 49% SWC picks those wastes using their hand (with or without glove). Using tool practice was also low in other countries (2, 31).

Respiratory diseases were repeatedly reported by SWC to their nearby representative even though no measurement had been taken. Different studies showed respiratory symptoms such as morning cough, morning phlegm Production, chest tightness and shortness of breath were the problem of SWC (1, 15, 32, 33). From this survey, only one tenth had experience of mask wearing. Generally PPE utilization among SWC in Addis Ababa was low when compared with a study in Egypt (31). Lack of PPE supply and

quality of PPE were the two reasons raised for this issue. Lack of PPE remained much urgent problem. Solid waste collectors expected to complete their own PPE by their pocket money. But their income was hand to mouth. The average monthly salary was 1232.53 ETB with range minimum 600 to maximum 2500 ETB. On the other hand, majority are addicted with different addictions including local alcohol consumption. From qualitative interview, it was found that every morning solid waste collectors drink local alcohol ("areqi") before they start their job. This might expose them money shortage in addition to health risks. Solid waste collectors were therefore vulnerable to injuries and punctured wounds which could be complicated by tetanus which was identified by a study in Nigeria among municipal solid waste collectors (11). In a multi variable analysis chat chewing negatively correlate with wearing PPE during duty. On the other hand, working day ≤6 per week, taking training on occupational health and being model family by taking UHEP were motivating factor to wear PPE during work assignment.

Health care service utilization among SWC is lower than other part of community. Urban health extension program training for model family was at end stage by addressing all residence during this study period. However, only quarter (25.1%) of SWC trained UHEP and graduated being model family. One of urban health extension program objective is promoting basic sanitation practices. this study participants frequent hand wash practice was less than Kersa woreda (Eastern Ethiopia)community regularly hand washing practice 85.9% (34). This indicates SWC are less influenced or marginalized from health care information and utilization when compared with general population. However, they are in the highest risk when compared with general population (12). In fact, SWC are exposed to more occupational health and safety risks than workers in many other industries (35). These realities are not emphasized and according to occupational safety long walk required in Addis Ababa. The survey showed only 46% trained about safety and 23.1% vaccinated tetanus which is not sound for risk prevention behavior. Low utilization of health care service could be low care for risk, influence of job condition or lack of concern for health care.

Working environment of SWC is obviously filthy (6, 36). On the other hand, facilities for risk prevention around working areas are almost null (2, 21, 31). Hygiene keeping facilities in this survey were also almost none. Around 93% of respondent could not access shower and dressing room. The respondent who had access shower and dressing room were irrespective of ownership. It might be public shower from youth center buildings. Unavailability of facilities might be lack of attention from concerned body and the system of organization is being private.

7. STRENGTH AND LIMITATION

7.1 Strength of the study

- The quantitative data was complemented by qualitative method.
- Six trained diploma holder health extension professionals collected the data with face to face interview and two masters degree supervisors were employed to check the data completeness and quality every day
- As baseline information about risk protection behavior of SWC, the findings of this study will have great contribution for further studies.

7.2 Limitation of the study

The determinants of health risk protection behavior cannot always be concluded, as the study being cross sectional. Some sort of desirability bias may not be eliminated even the survey was anonymous.

8. CONCLUSSION AND RECOMMENDATION

8.1 Conclusion

This study sought the behaviors that SWC practiced in Addis Ababa city administration by applying mixed research method. From the study we can conclude that health risk protection behavior among solid waste collectors in Addis Ababa town is poor. Standard PPE usage among them is unsatisfactory and they exposed to multiple risk factors which could cause one or more issue of infection, injury and disability. Half of them are addicted which significantly influenced their risk protection behavior. Above three fourth of them had no basic health care service utilization. Almost all SWC have not hygiene keeping facilities and unhygienic adaptation is a common practice. Stigma by the community, back ground of SWC, lack of concern, addiction, lack of PPE and nature of the job were major identified reasons for bad behavioral practices. Majority of SWC have low knowledge level in terms of awareness, positive attitude towards risk protection and bad practice level on prevention of risk.

8.2 Recommendations

From the findings, we suggest the following recommendations to the bodies specified

- Addis Ababa City Solid Waste Management and Recycling Project Office need to take measures to improve the work environment of SWC by ensuring availability safe drinking water, staff room and sanitation facilities during working hours.
- Sub cities and woreda cleaning and beautification offices should engage in safety training program for SWC and community based mobilization about social communication with SWC, waste storage and risk minimization
- Collaborative effort between organization is needed for provision of standard PPE, behavioral advocacy and establishing a system of routine surveillance among SWC along with further follow-up
- Nongovernmental organizations, health institutes and scholars should be encouraged to study the health of solid waste workers, community attitudes towards SWC and other concern as it is very limited data in the field and the problem is not touched yet.

References

1. Cointreau S. Occupational and Environmental Health Issues of Solid Waste Management Special Emphasis on Middle- and Lower-Income Countries: The World Bank Group. Washington, D.C : Urban Sector Board, July 2006
2. Thirarattanasunthon P, Siriwonga W, G. Robson M. Health Risk Protection Behaviors among Scavengers in Municipality Dump Sites, Nakhon Ratchasima Province, Thailand: Asia Pacific Conference on Environmental Science and Technology *Advances in Biomedical Engineering. 2012 vol 6*
3. Bogale D, Kumie A, Tefera W: Assessment of Occupational Injuries among Addis Ababa City Municipal Solid Waste Collectors: a Cross-Sectional Study. *BMC Public Health* 2014, 14:169 doi:10.1186/1471-2458-14-169
4. Sujitranjan Das S. Occupational Health Problems among Door to Door Solid Waste Handlers in Surat city, Gujarat 2nd International Conference and Exhibition on Occupational Health & Safety ; May 21-22, 2013 DoubleTree by Hilton Beijing, China: Sri Chitra Tirunal Institute for Medical Sciences and Technology, India.
5. Zurbürg C: Urban Solid Waste Management in Low-Income Countries of Asia How to Cope with the Garbage Crisis. Presented for: Scientific Committee on Problems of the Environment (SCOPE) Urban Solid Waste Management Review Session: Durban , South Africa; November 2002
6. Devi K.S., Swamy A. V.V.S. ,Krishna R.H. Studies on the Solid Waste Collection by Rag Pickers at Greater Hyderabad Municipal Corporation,India: *International Research Journal of Environment Sciences,* ISSN 2319–1414. 2014 3(1):13-22
7. Sarkar P: *Solid Waste Managenent in Delhi-A Social Vulnerability Study Third International Conference on Environment and Health.* Chennai, India: Department of Geography, University of Madras and Faculty of Environmental Studies, York University; 2003.

8. Tooher R, Griffin T, Shute E, Maddern G: Vaccinations for waste-handling workers: a review of the literature. *Waste Manag Res* 2005, 23:79 86. PubMed Abstract | Publisher Full Text, November 25, 2014

9. Sabde YD, Zodpey SP: A study of morbidity pattern in street sweepers: a cross-sectional study. *Indian J Community Med* 2008., 33(4)

10. Rushbrook P. The Health Effects from Wastes - Overplayed or Underestimated? Workshop: Health Impact of Waste Management Activities IWM Annual Conference, Paignton, UK. June 2001; Regional Advisor-Waste Management, WHO, Via Francesco Crispi 10. 00187 Rome, Italy

11. Inyang M.P. Health and Safety Risks amongst the Municipal Solid Waste Collectors in Port Harcourt Metropolis of the Niger Delta Region of Nigeria International Conference "Waste Management, Environmental Geotechnology and Global Sustainable Development ; August 28- 30, 2007 ; Ljubljana Slovenia: Dept. of Human Kinetics and Health Education Faculty of Education, University of Ibadan.

12. Bastani M, Moore D. E,Celik N. Case Studies on Quantification of Occupational Health Risks for Solid Waste Workers in Florida counties: Department of Industrial Engineering, University of Miami Coral Gables, FL; USA . *Proceedings of the 2014 Industrial and Systems Engineering Research Conference*

13. Rogers B. Municipal healthcare workers: work-related health hazards. Occup Med. 2001 Jan-Mar; 16(1):143- 161.

14. McDowell I. Measuring Health: A Guide to Rating Scales and Questionnaires: Oxford university press,Third Edition. 2006

15. Djoharnis J, Shafei M.N, Musa K.I,Abdullah M.R, Ibrahim M.I. Respiratory Symptoms and Lung Functions among Domestic Waste Collectors: An Experience in a Developing Country like Malaysia: Department of Community Medicine, School of Medical Sciences, Universiti of Sains; *International Journal of Collaborative Research on Internal Medicine & Public Health. 2012 4(10)*

16. Hunt D.P. The Concept of Knowledge and How to Measure It: *Human Performance Enhancement, Inc., Las Cruces, New Mexico, USA;*Journal of Intellectual Capital. 2003 4(1):100-113

17. Dorevitch S, Marder D. Occupational hazards of municipal solid waste workers. Occup Med. 2001 Jan Mar; 16(1):125-133.

18. *Nielson EM,* O. Breum N, Nielsen BH,Wiirtz H, Poulsen OM, Midtgaard U:Bioaerosol Exposure in Waste Collection: A Comparative Study on the Significance of Collection Equipment, Type of Waste and Seasonal Variation. British Occupational Hypene Society; *Ann occup. Hyg.,* VoL 41, No 3, pp. 325-344, 1997

19. An H, Englehard J, Fleming L, Bean J: Occupational health and safety amongst municipal solid waste workers in Florida. *Waste Manag Res* 1999, 17(5):369-377.

20. Rushton L: Health hazards and waste management. *Oxford J Med British Med Bull* 2003, 68(1):183-197. Publisher Full Text

21. *Jayakrishnan T, Jeeja M.C, Bhaskar R.* Occupational health problems of municipal solid waste management workers in India: Departments of Community Medicine Government Medical College, Calicut, Kerala;India. http://www.ijehe.org on Wednesday, December 10, 2014, IP: 213.55.104.226

22. Boadi KO, Kuitunen M: Municipal Solid Waste Management in the Accra Metropolitan Area, Ghana. Kluwer Academic Publishers; Manufactured in The Netherlands, 2004

23. Searl A, Crawford J. Review of Health Risks for workers in the Waste and Recycling Industry: Report, IOM contract no: 611-00491. May 2012

24. Kuijer P.FM, van der Beek BJ, van Dieën JH, Visser B,Frings-Dresen MHW: Effect of Job Rotation on Need for Recovery Musculoskeletal Complaints, and Sick Leave Due to Musculoskeletal Complaints: A Prospective Study among Dutch Refuse Collectors. University of Amsterdam; The Netherlands, 2004

25. Gwisai R.D, Areola O, Segosebe E. Respiratory and Occupational Health Problems of Scavengers and Landfill Employees in a Municipal Landfill Site in Lobatse, Botswana: Department of Environmental Science, University of

Botswana, Journal of Sustainable Development in Africa. 2014 16(1) *ISSN: 1520-5509*

26. Roelena C.A.M, Koopmansb P.C , Groothoffc J.W. Which work factors determine job satisfaction?: Work 30 (2008) 433–439 433 IOS Press. December 2006
27. Lu H, While A.E, Barriball K.L. Job satisfaction and its related factors: A questionnaire survey of hospital nurses in Mainland China: International Journal of Nursing Studies 44 (2007) 574–588. July 2006
28. Mudalige OMDCS,Dharmathilake AD. Health problems among Colombo Municipal council workers University of Colombo 2000.
29. Halim I,Bedia AO,Recep B, et al. Respiratory functions of the people working in solid waste storage centers, in Istanbul. Noble Medicus 19 2011;7(1):29-36
30. Rakib MDA, Rahman MDA, Akter MS, Ali M et al. An Emerging city: Solid Waste Generation and Recycling Approach. International journal of scientific research in environmental science 2(3)pp 74-84,2014. http://www.ijsrpub.com/ijsres
31. El-Wahab EWA, Eassa SM, Loffi SE, El Masry SA, Shatat HZ. Adverse Health Problems among Municipality Workers in Alexandria (Egypt):Int J prev Med 2014;5:545-56
32. Wouter IM, Hilhorest SKM, Kelppe P, Doekes G et al Upper Air Way Inflammation and Respiratory Symptoms in Domestic Waste Collectors. Downloaded from oem.com on July 13,2011-published by group.bmi.com
33. Neghab M, Kazerouni FK, Hassanzadeh J, Ahmadzadeh F. Assessment of Respiratory symptoms and lung functional impairments among a Group of Garbage Collectors. IJHS,5:76-81,2013
34. Mengistie B, Baraki N. Community based assessment on household management of waste and hygiene practices in Kersa Woreda, Eastern Ethiopia. *Ethiop. J. Health Dev.* ;24(2). PP 104-109, 2010
35. Huren A. Occupational health and safety amongst municipal solid waste workers in Florida. Waste Manage Res 1999;17:369-77

36. Rushbrook P. The Health Effects from Wastes - Overplayed or Underestimated? IWM Annual Conference, Paignton, UK. June 2001. WHO, Via Francesco Crispi 10. 00187 Rome, Italy

Annex I **Data Collection Tools**

1. Quantitative data collection questionnaire

Addis Ababa University School of Public Health

Questionnaire for assessment of health risk protection behaviors among solid waste collectors in Addis Ababa, Ethiopia, 2015

Name of PI: Molla Mekashaw

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E-mail: molmresearch@gmail.com

A. INFORMED CONSENT

How are you? I am----------. I am working in the research team of Addis Ababa University School of Public Health. The purpose of this study is to know health risk protection behaviors and associated factors. The research will be helpful to tackle risk behaviors and to encourage health risk protection practices of solid waste collectors and also will help us to develop services and training programs. There is no risk because of your participation in this study. Your name will not appear on this questionnaire and all the information you provide to me will be strictly confidential. You have a right to escape the question that you do not want to answer and you can put an end to this interview any time, when you decide to stop. Your contribution in this study does not involve any direct risk or benefit for you but it is very useful to plan strategy which improve the health of solid waste collectors. Thus, your ideas are very essential for us to better understand your behaviors in relation to your health protection in work. If you fill discomfort with the questionnaire, please fill free to stop it any time you want. This questionnaire will take about 20 minutes. Could I have your permission to continue?

1. **If yes, signature_____, Continue the interview**
2. **If no, thank and go to the next participant**

Responsible data collector for the agreement

Name _____

Signature _____

Result of interview:

1. Completed 2. Respondent not available 3. Refused 4.partially completed

Checked by :

Supervisor Name ……signature……date……

Assessment of health risk protection behaviors among solid waste collectors in Addis Ababa, Ethiopia, 2015

Questionnaire identification number---------- Date----------

Name of enterprise ----------

Address: sub city----------

Woreda----------

Section I**. Socio demographic information of participants**

S. No	Question	Possible Response
101	Sex	Male Female
102	Age	_____Years
103	Marital status	1. Married 3. Divorced / Separated 2. Single 4. Widowed
104	Educational level	1. Illiterate 3. Grade 1-8 2. Can read and write 4. Grade 9-12 5. above grade 12
105	Work experience in years as solid waste collector	_____Years (if less than one year stop)
106	Working days per week	_____Days
107	Working hours per day	_____Hours
108	No of families at home	----------
109	How much is your monthly	

	salary	----------
110	Do you have any job other than this?	Yes 2. No
111	If "yes" for Q110 how much is your monthly salary from the other job?	----------

Section II**. Knowledge about waste hazards and risks**

S.No	Question	1= True	2= False	code
201	How noise affects you will depend upon how long you were exposed to a sound, the loudness of the sound, and the ability of your body to recover after that exposure.	1	2	
202	The main purpose of personal protective equipment is to protect someone from risk.	1	2	
203	Injury is one and major of health risk during solid waste collection.	1	2	
204	Risk is the chance of somebody being harmed by hazard and how much it is serious.	1	2	
205	Hazard is anything like chemicals, noise that cause harm.	1	2	
206	Solid wastes can cause respiratory health problems.	1	2	
207	Commonly known solid waste management systems are; reduce, reuse, recycle and release.	1	2	
208	Periodical medical checkup means go to health facility in specified period of time.	1	2	

209	some wastes are non infectious.	1	2	
210	TB treatment is among exempted health care service in Ethiopia.	1	2	
211	Health care wastes are high risky than domestic wastes.	1	2	

Section III**. Attitude towards health risk**

S. No	Question	Possible Options				
		1=Strongly disagree	2=disagree	3=neutral	4= agree	5=Strongly agree
301	Generally, wastes are considered threaten for health.	1	2	3	4	5
302	I believe wearing personal protection equipments reduce risk.	1	2	3	4	5
303	I agree that solid waste collection is more risky job than office jobs.	1	2	3	4	5
304	I think the involvement of our managers or supervisors to minimize risk are important.	1	2	3	4	5
305	Addiction increase the probability of risk.	1	2	3	4	5
306	I always think risk during	1	2	3	4	5

	my work					
307	I believe some health intervention programs need to be started to improve the health of solid waste collectors.	1	2	3	4	5
308	I think periodical medical checkup is important to improve solid waste collectors' health.	1	2	3	4	5
309	I believe our health is depending on my care during work.	1	2	3	4	5

Section IV**. Health risk protection practice**

S. No	Question	Possible Options		Skip
		1=Yes	2=No	
401	Do you wash your hands frequently With soaps? If so, when? (more than one answer is possible)	1	2 ⟶	Q202
401a	Before eating	1	2	
401b	If hand becomes contaminated	1	2	
401c	Before using toilet, drinking, wearing glove	1	2	
401d	Before using cell phone, smoking	1	2	

402	Do you and your colleagues at work help each other when you encounter any problems?	1	2	
403	Do you eat while working?	1	2	
404	Do you wear personal protective equipment always during your work duty? (more than one answer is possible)	1	2 →	Q105
404a	Glove	1	2	
404b	Gown	1	2	
404c	Goggle	1	2	
404d	Mask	1	2	
404e	Hat	1	2	
404f	Boot	1	2	
405	Do you lift around more than 50 kg objects while working?	1	2	
406	Do you shake hands with others while on duty?	1	2	
407	Have you ever been injured or feel illness at work?	1	2	
408	Do you share protective Clothing with colleagues?	1	2	
409	Do you use tools during work? What are those? (more than one answer is possible)	1	2 →	Q109

409a	rigid receptacles for picking up sharp objects	1	2	
409b	thick stick to compress waste in to the container	1	2	
410	Had you at least one health treatment at health facility because of illness in the past 12 months?	1	2	

Section V. **Reinforcing issues (in the last 12 months)**

S.No	Question	1= yes	2= no	Code
501	Do you smoke?	1	2	
502	Do you drink alcohol?	1	2	
503	Do you chew chat?	1	2	
504	Have you faced any violence?	1	2	
505	Do you keep your personal hygiene properly?	1	2	
506	Have you sleeping disorder	1	2	

Section VI**. Health education and care**

S.No	Question	1=yes	2=No	Code
601	Have you learnt urban health extension packages and graduate as model family?	1	2	
602	Have you got training on any type of occupational safety issues during the last 12 months?	1	2	
603	Do you have fee waiver service card?	1	2	
603	Were you been vaccinated for tetanus?	1	2	

Section VII Working **conditions**

S. No	Questions	1= Yes	2= No	Code
701	Have you staff room in which you discuss and take rest with your colleagues?	1	2	
702	If so, is it suitable to eat?	1	2	
703	Is there safe drinking water available?	1	2	
704	Is there a bathroom/shower?	1	2	
705	Is there cloth changing/dressing room?	1	2	

2. Qualitative Data Collection Semi-structured Guide: Solid Waste Collectors Health Risk Protection Behavior Survey, 2015, Addis Ababa,Ethiopia

In-depth Interview with solid waste management Woreda office head or supervisor

1 Sub city……..

2 Woreda: ……

3 Name of interviewee: …….

4 Interviewer name: …….

5 **Date of interview**: …….

Management Support and Workers Behavior for Prevention of Health Risks

1. Do you think solid waste collectors have enough and complete personal protective equipments? Please list all type of personal equipments currently available in your woreda.
2. Do you think they wear these personal protective equipments properly and always during duty? If not, why not?
3. Do you think solid waste collectors are interested by their job? What is the reason?
4. What are practices by solid waste collectors to prevent health risk? If No, Why?
5. Was there any question from solid waste collectors about their health to your office?
6. Is there any system in your office to improve the health of solid waste collectors?
7. Do you think solid waste collectors are alert enough to protect physical, psychological, emotional, sexual and other violence?
8. Do you have any additional idea not mentioned?

Thank you!

Amharic version Informed Consent & Questionnaire

በጥናቱ ለመሳተፍ ስምምነት መግለጫ ቅፅ

የአጥኝዉ ስምና አድራሻ፡
ስም፡ ሞላ መካሻዉ
አድራሻ፡ አዲስ አበባ ዩኒቨርስቲ የህብረተሰበ ጤና ሳይንስ ትምህርት ቤት
ስልክ፣ 09 13 61 14 35
ኢሜይል፡ molmresearch@gmail.com

እንዴት ነህ/ሽ? እኔ_____ እባላለሁ፡፡ የምሰራዉ ከአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና ሳይንስ ትምህርት የድህረ-ምረቃ ፕሮግራም ትምህርት ቤት ነዉ፡፡ የዚህ ጥናት ዓላማ የደረቅ ቆሻሻ ሰብሳቢዎች የጤና አደጋዎችን ለመከላከል ያላቸዉን ባህርያትና ተዛማጅ ሁኔታዎችን መዳሰስ ነዉ። ጥናቱ ለጤና ችግር የሚያጋልጡ ባህሪያትን ለማስወገድና ተጋላጭነትን ለመቀንስ እንዲሁም በጤና ላይ ሊደርስ የሚችሉ አደጋዎችን ለመከላከል የሚተገበሩ ባህርያትን የሚያበረታታ ሲሆን በተጨማሪም የአገልግሎትና የስልጠና መርሐ ግብሮችን ለማዘጋጀት ያግዛል፡፡ በዚህ ጥናት በመሳተዎ ምንም ችግር አይገጥመዎትም። ስምዎ በዚህ መጠይቅ ላይ አይጻፍም፡፡ እናም የሚሰጡኝ መረጃ ምስጢራዊነቱ በከፍተኛ ደረጃ የተጠበቀ ነዉ። መመለስ የማይፈልጉትን ጥያቄ ማለፍና ማቆም አለብኝ ብለዉ ባሰቡ በማንኛዉም ጊዜ ቃለ ምልልሱን የማቆም መብት አለዎት። በዚህ ጥናት የሚያደርጉት አስተዋፅዖ ለእርሰዎ ቀጥተኛ የሆነ ጥቅም ወይም ጉዳት የለዉም። ነገር ግን የደረቅ ቆሻሻ ሰብሳቢዎችን ጤና የሚያሻሽል ዕቅድ ለማዉጣት በጣም ጠቃሚ ነዉ። ስለዚህ በስራ ቦታዎ በጤና ላይ የሚደርሱ አደጋዎችን ለመከላከል ያለዎትን ባህርያት በተሻለ ሁኔታ እንድንገነዘብ ሀሳበዎት በእጅጉ አስፈላጊ ነዉ። በጥያቄዉ ዉስጥ ምንአልባት ደስ የማይል ስሜት ከተፈጠረበዎ እባከዎን ጥያቄዉን ለማቋረጥ ነጻ ይሁኑ። ይህ ጥያቄ 15 ደቂቃ ሊዎስድ ይችላል። ጥያቄዉን ለመቀጠል ፈቃደዎን ማግኘት እችላለሁ?

1.አዎን ከሆነ፣ የስምምነት ፊርማ.....፣ መጠይቁን መሙላት ቀጥል/ይ

2. አይ ከሆነ፣ አመስግነህ/ሽ ወደ ቀጣይ ተሳታፊ ሂድ/ጂ

ስምምነቱን ያስፈረመዉ መረጃ ሰብሳቢ

ስም ._____

ፊርማ ._____

የመጠይቁ ዉጤት

1. የተሟላ 2. ተሳታፊዉ/ዋ አልነበሩም 3. ተሳታፊዉ/ዋ ፈቃደኛ አይደሉም 4. በከፊል የተሟላ

ያረጋገጠዉ፣

የአስተባባሪዉ ስም _____

ፊርማ _____

መጠይቅ

አዲስ አበባ ዩኒቨርስቲ የህብረተሰብ ጤና ት/ቤት
በአዲስ አበባ ከተማ እ ኤ አ 2015 የደረቅ ቆሻሻ ሰብሳቢዎች በጤና ላይ ሊደርሱ የሚችሉ አደጋዎችን የመከላከል ባህሪ ዳሰሳ
የመጠይቁ መለያ ቁጥር_____
የማህበሩ ስም _____
አድራሻ ፣ ክፍለ ከተማ_____ ቀን_____
_____
ወረዳ _____

ክፍል ፤ የተሳታፊዎች ማህበራዊ ስነ ህዝብ መረጃዎች

ተ ቁ	ጥያቄ	መልስ ሊሆን የሚችል	ኮድ
101	ፆታ	1. ወንድ 2. ሴት	
102	ዕድሜ	----------ዓመት	
103	የጋብቻ ሁኔታ	1. ያገባ 3. የተለያየ/የተፋታ 2. ያላገባ 4. የሞተበት	
104	የትምህርት ደረጃ	1. ያልተማረ 2. ማንበብና መፃፍ የሚችል 3. ከ1-8 ክፍል 4. ከ9-12 ክፍል 5. ከ12ኛ ክፍል በላይ	
105	ደረቅ ቆሻሻ ሰብሳቢ ሁነዉ የሰሩት የስራ ልምድ በዓመት	----------ዓመት (ከአንድ ዓመት ካነሰ መጠይቁን ያቁሙ)	
106	ሳምንታዊ የስራ ቀናት	----------ቀኖች	
107	የስራ ሰዓት በቀን	----------ሰዓት	
108	በቤት ዉስጥ ያለ የቤተሰብ ብዛት	----------	
109	ወርሃዊ ደመወዝዎ ስንት ነዉ	----------ብር	
110	ከዚህ ስራ ዉጭ ሌላ ተጨማሪ ስራ አለዎት	1. አዎ 2. የለም	
111	ለጥያቄ 110 መልሰዎ “አዎ” ከሆነ ከተጨማሪ ስራዎ የሚያገኙት ወርሃዊ ገቢ ስንት ነዉ	----------ብር	

ክፍል II ስለ ቆሻሻዎች የጤና አደገኛነትና ለአደጋ ተጋላጭነት አጋጣሚዎች ዕዉቀትን በተመለከተ

ተ ቁ	ጥያቄ	1= ሀሰት	2=እዉነት	ኮድ
201	በድምጽ ብክለት የመኖዳት ሁኔታ ለድምፅ ተጋልጠዉ በቆዩበት ጊዜ፣ በድምፁ ከፍታ መጠንና በሰዉነትዎ ከጉዳት የማገገም አቅም ይወሰናል	1	2	
202	የግለሰብ የስራ ቦታ አልባሳት ዋና ዓላማ ሰዎችን ከተጋላጭነት /አደጋ መከላከል ነዉ ።	1	2	
203	የአካላዊ ጉዳት አደጋ ደረቅ ቆሻሻ በሚሰበሰብበት ጊዜ ከሚደርሱ የጤና ችግሮች አንዱና ዋናዉ ነዉ።	1	2	
204	አስጊ ማለት አንድ ሰዉ ጉዳት በሚያደርሱ ነገሮች የመጋለጥ ዕድል እና የጉዳቱ ደረጃ ማለት ነዉ።	1	2	
205	አደጋ አምጪ ማለት ማንኛዉም እንደ ኬሚካል፣ ጫጫታ ሆኖ ጉዳት ሊያመጣ የሚችል ማለት ነዉ።	1	2	
206	ደረቅ ቆሻሻ የስርዓተ ትንፈሳ ጤና ችግር ሊያመጣ ይችላል።	1	2	
207	ብዙ ጊዜ የተለመዱ የደረቅ ቆሻሻ አወጋገድ ዘዴዎች መቀነስ (reduce)፣መልሶ መጠቀም (reuse)፣ እንደገና ሰርቶ መጠቀም (recycle)ና ማስወገድ (release) ናቸዉ።	1	2	
208	በተቀመጠ የጊዜ ገደብ ዉስጥ የጤና ምርመራ ማድረግ ማለት አንድ ሰዉ በተቀመጠዉ የጊዜ ገደብ ወደ ጤና ተቋም ሂዶ በጤና ባለሙያ ምርመራ ማድረግ ማለት ነዉ።	1	2	
209	አንዳንድ ቆሻሻዎች በሽታ የሚያመጡ አይደሉም	1	2	
210	በኢትዮጵያ የሳንባ ነቀርሳ በሽታ ህክምና በነፃ ከሚሰጡ የጤና አገልግሎቶች አንዱ ነዉ።	1	2	
211	ከጤና ተቋም የሚዎጡ ቆሻሻዎች ለጤና ችግር ያላቸዉ አስጊነት ከመኖሪያ ቤት ከሚወጡ ቆሻሻዎች የበለጠ ነዉ።	1	2	

ክፍል III ለጤና አደጋ ተጋላጭነት ላይ የአመለካከት ሁኔታ

ተቁ	ጥያቄ	መልስ ሊሆኑ የሚችሉ አማራጮች				
		1 = በጣም አልስማማም	2=አልስማማም	3=መስማማትም አለመስማማትም አልፈልግም	4=እስማማለሁ	5=በጣም እስማማለሁ
301	በአጠቃላይ ሲታይ ቆሻሻዎች ለጤና አስጊ ናቸዉ	1	2	3	4	5
302	የአደጋ መከላከያ አልባሳትን መልበስ በጤና ላይ ሊደርሱ የሚችሉ አደጋዎችን ይቀንሳል ብየ አምናለሁ	1	2	3	4	5
303	ደረቅ ቆሻሻ የመሰብሰብ ስራ ከቢሮ ስራ የበለጠ ለጤና አስጊ ነዉ	1	2	3	4	5
304	የሃላፊዎች ተሳትፎ የጤና አደጋዎችን ለመቀነስ ጠቀሜታ ይኖረዋል	1	2	3	4	5
305	ሱሶች ለጤና ችግር ተጋላጭነት ዕድልን ይጨምራሉ	1	2	3	4	5
306	በስራ ወቅት አደጋ ሊከሰት እንደሚችል ሁልጊዜ አስባለሁ	1	2	3	4	5
307	ደረቅ ቆሻሻ የሚሰበስቡ ሰራተኞችን ጤና ለማረጋገጥ ችግር ፈቺ የጤና መርሀ ግብሮች መጀመር አለባቸዉ ብዬ አምናለሁ	1	2	3	4	5
308	ደረቅ ቆሻሻ የሚሰበስቡ ሰራተኞችን ጤና ለማረጋገጥ ጊዜዉን የጠበቀ የጤና ምርመራ	1	2	3	4	5

	ማድረግ ጠቃሚ ነዉ					
309	ጤናዎ በስራ ወቅት በሚያደርጉት ጥንቃቄ ይወሰናል	1	2	3	4	5

ክፍል IV ለአደጋ ተጋላጭነት መከላከል ተግባራትን በተመለከተ

ተ ቁ	ጥያቄ	መልስ የሚሆኑ		ዝለል
		1=አዎ	2= አይ	
401	እጅዎትን በሳሙና አዘዉትረዉ ይታጠባሉ ከሆነ መቼ (ከአንድ በላይ መልስ ይቻላል)?	1	2 →	ጥያቄ 402
401ሀ	ከመመገበዎ በፊት?	1	2	
401ለ	እጅ ከተበከለ?	1	2	
401ሐ	መጸዳጃ ቤት ከመጠቀም ፣ ከመጠጣት ፣ ጓንት ከመልበስ በፊት?	1	2	
401መ	ከማጨስ፣ስልክ ከመጠቀም በፊት?	1	2	
402	እርሰዎና የስራ ባልደርባዎችዎ ማንኛዉም ችግር ሲያጋጥማችሁ እርስ በእርሳችሁ ትረዳዳላችሁ?	1	2	
403	በስራ ላይ እያሉ ይመገባሉ?	1	2	
404	የግል አደጋ መከላከያ አልባሳት በየቀኑ በሚሰሩበት ጊዜ ይለብሳሉ (ከአንድ በላይ መልስ ይቻላል)?	1	2 →	ጥያቄ 405
404ሀ	ጓንት?	1	2	
404ለ	ገዋን/ካቦርት?	1	2	
404ሐ	ትልቅ የዓይን መከላከያ መነፅር?	1	2	
404መ	ፊት መሸፈኛ/ጭምብል?	1	2	
404ሠ	ባርኔጣ?	1	2	
404ረ	ትልቅ ሽፍን ጫማ?	1	2	
405	ስራ በሚሰሩበት ወቅት ከ50 ኪግ በላይ ክብደት ያላቸዉን ዕቃዎች ያነሳሉ?	1	2	
406	ስራ በሚሰሩበት ወቅት ከሌሎች ጋር ለሰላምታ ይጨባበጣሉ?	1	2	
407	ስራ በሚሰሩበት ወቅት ቆስለዉ ወይም የህመም ስሜት ተሰምቶዎት ያዉቃል?	1	2	
408	የአደጋ መከላከያ ልብሰዎትን ለስራ ባልደርባዎችዎ	1	2	

	ያጋራሉ/ያዉሳሉ?			
409	ስራ በሚሰሩበት ወቅት አጋዝ መሳሪያዎች ይጠቀማሉ አዎ ከሆነ ምንድን ናቸዉ (ከአንድ በላይ መልስ ይቻላል)?	1	2 ⟶	ጥያቄ 410
409ሀ	ጠንካራ ዕቃ መያዛ ስለታም ነገሮችን ለማንሳት?	1	2	
409ለ	ወፍራም እንጨት ቆሻሻዉን በመያዛዉ ዉስጥ ለማመቅ/ለመጠቅጠቅ?	1	2	
410	ባለፉት 12 ወራት በመታመመዎ ምክንያት ወደ ጤና ተቋም ሂደዉ ቢያንስ አንድ ጊዜ ህክምና አግኝተዋል?	1	2	

ክፍል V አባባሽ/ገፊ ጉዳዮችን በተመለከተ (ባለፉት 12 ወራት)

ተ ቁ	ጥያቄ	አማራጮች	
		1=አዎ	2=አይ
501	ሲጋራ ያጨሳሉ?	1	2
502	አልኮል ይጠጣሉ?	1	2
503	ጫት ይቅማሉ?	1	2
504	ማንኛዉም ዓይነት ብጥብጥ/ጠብ አጋጥሞዎት ነበር?	1	2
505	የግል ንፅህናዎን በሚገባ ይጠብቃሉ?	1	2
506	የእንቅልፍ መቃዎስ/በቂ እንቅልፍ ያለማግኘት ችግር አለበዎት?	1	2

ክፍል VI የጤና ትምህርትና እንክብካቤ

ተ ቁ	ጥያቄ	አማራጮች	
		1=አዎ	2=አይ
601	የከተማ ጤና ኤክስቴንሽን ፕሮግራም ፓኬጆችን ተምረዉ የጤና ሞዴል ሁነዉ ተመርቀዋል?	1	2

602	ባለፉት 12 ወራት ስለ ስራ ቦታ ደህንነት ማንኛዉም ዓይነት ስልጠና ወስደዉ ነበር?	1	2
603	የነፃ ህክምና መጠቀሚያ ካርድ አለዎት?	1	2
604	ቴታነስ ክትባት ወስደዋል?	1	2

ክፍል VII የስራ ቦታ ሁኔታዎች

ተ ቁ	ጥያቄ	አማራጮች		ዝለል
		1= አዎ	2= አይ	
701	የመስሪያ ቤት ማረፊያ/ከጓድኞችዎ ጋር የሚዎያዩበት ክፍል አላችሁ?	1	2 →	ጥያቄ 703
702	ካላችሁ ለመመገብ ምቹ ነዉ?	1	2	
703	በስራ ቦታችሁ/መስሪያ ቤታችሁ ንጹህ የመጠጥ ዉሃ አለ?	1	2	
704	በመስሪያ ቤታችሁ ሻዎር አለ?	1	2	
705	በመስሪያ ቤታችሁ ልብስ የመቀየሪያ ክፍል አላችሁ?	1	2	

አመሰግናለሁ

በከፊል የተዋቀረ ሀተታዊ መረጃ መሰብሰቢያ መጠይቅ

በጤና ላይ ሊደርሱ የሚችሉ አደጋዎችን ለመከላከል የደረቅ ቆሻሻ ሰብሳቢዎች ጠባይ ዳሰሳ ጥናት አዲስ አበባ፤ ኢትዮጵያ 2007 ዓ/ም

በዋናነት ከሚመለከታቸዉ የወረዳ ጽዳትና ዉበት ጽ/ቤት ሃላፊዎችና አስተባባሪዎች ጋር ቃለ ምልልስ

I. ክፍለ ከተማ----------
II. ወረዳ----------
III. ቃለ መጠይቅ የተደረግለት ሰዉ ስም----------
IV. ቃለ ምልልስ ያደረገዉ ሰዉ (መረጃ ሰብሳቢ) ስም----------
V. ቃለ ምልልሱ የተካሄደበት ቀን----------

በጤና ላይ ሊደርሱ የሚችሉ አደጋዎችን ለመከላከል የሰራተኞች ጠባይና የሃላፊዎች ድጋፍ

1. በወረዳዎ የሚሰሩ ደረቅ ቆሻሻ ሰብሳቢዎች በቂና የተሟላ የአደጋ መከላከያ አልባሳት አላቸዉ ብለዉ ያስባሉ? እባከዎ በአሁኑ ሰዓት በወረዳዎ የሚገኙ የአደጋ መከላከያ አልባሳትን ይጥቀሱልኝ
2. ያላቸዉን የአደጋ መከላከያ አልባሳት በተገቢዉ ሁኔታ በስራ ወቅት ሁልጊዜ ይለብሳሉ? ካልለበሱ ምክንያቱ ምን ይመስለዎታል?
3. ደረቅ ቆሻሻ ሰብሳቢዎች ስራቸዉን ይወዱታል ብለዉ ያስባሉ? ምክንያቱ ምንድ ነዉ?
4. ደረቅ ቆሻሻ ሰብሳቢዎች በጤናቸዉ ላይ የሚደርሱ አደጋዎችን ለመከላከል የሚያደርጉትን ጥረት ይግለጹልኝ? ጥንቃቄ የማያደርጉ ከሆነ ምክንያቱ ምን ይመስለዎታል?
5. ደረቅ ቆሻሻ ሰብሳቢዎች ስለጤናቸዉ በማሰብ ለመስሪያ ቤትዎ ያቀረቡት ጥያቄ ነበር
6. በመስሪያ ቤትዎ ደረቅ ቆሻሻ ሰብሳቢዎች ለጤናቸዉ ጥንቃቄ እንዳደርጉ የተዘረጉ በመረጃ የተያዙ ስርዓቶች አሏችሁ
7. ማንኛዉም አካላዊ፤ስነ ልቦናዊ፤ ስሜታዊ፤ ጾታዊና ሌሎች ጥቃቶችን ለመከላከል ደረቅ ቆሻሻ ሰብሳቢዎች ንቃተ ህሌናቸዉ የዳበረ ነዉ ብለዉ ያስባሉ?
8. እስካሁን ባነሳናቸዉ ነጥቦች ተጨማሪ ሃሳብ ካለዎት ይግለጹልኝ

በጣም አመሰግናለሁ።

Annex II Code of In-depth interviewee

S.no	Code	Year of experience	Sub city	Woreda
1	P_1	7	Kirkos	9
2	P_2	2	Kirkos	2
3	P_3	6	N/S Lafto	6
4	P_4	4	Kirkos	7
5	P_5	5	N/S lafto	8

Annex III Sampled Uniouns

በቂርቆስ ክ/ከተማ የሚገኙ ለጥናት የተመረጡ የደረቅ ቆሻሻ ሰብሳቢዎች ማኅበራት

ተቁ	የማህበሩ ስም	የሚገኝበት ወረዳ	በጥናቱ የሚሳተፉ ብዛት	ምርመራ
1	እንስራ	1	10	
2	ዉበት ፍለጋ	1	10	
3	ሳዶር	2	10	
4	ህዳሴ	2	10	
5	ጥበብ ፅዱና አረንጓዴ	2	10	
6	ኢትዮጵያ	3	10	
7	ኤምኤ	3	10	
8	ዲቦራ	4	10	
9	ራስአገዝ	4	10	
10	ጤና ለሁሉም	4	10	
11	ይሻላል	5	10	
12	ሰላም	5	10	
13	አንድነት	6	10	
14	ሮህቦት	6	10	
15	ፈጥኖ ደራሽ	6	10	
16	ወርቃማዉ	7	10	
17	ዕድገት በስራ	7	10	
18	በፍቅር	8	10	
19	ዕድገት	8	10	
20	አዲስ ተስፋ	8	10	
21	ሮኬት	9	10	
22	እጅ ለስራ	9	10	
23	ጥበብና ጽዱ	10	10	
24	ህብረት	10	10	
25	አዲስ ፍሬ	11	10	
26	አንበሳ	11	10	

በን/ስ/ላፍቶ ክ/ከተማ የሚገኙ ለጥናት የተመረጡ የደረቅ ቆሻሻ ሰብሳቢዎች ማህበራት

ተቁ	የማኅበሩ ስም	የሚገኝበት ወረዳ	የሚሳተፉ ብዛት	ምርመራ
1	ለምለም	1	10	
2	ኮከብ	1	10	
3	አዞን	1	10	
4	ራዕይ ለፍሬ	1	10	
5	የዕድገት ምንጭ	1	10	
6	ባህሩና ሙሉጌታ	1	10	
7	ጌታቸዉና ጓድኞቹ	1	10	
8	አረንጓዴ ጽዳት	1	10	
9	ልደታ	1	10	
10	ድል በትግል	2	10	
11	ተስፋ ህይወት	2	10	
12	ልማት ለሀገር	2	10	
13	ተስፋ	2	10	
14	ጽዳት በህብረት	3	10	
15	አቤኔዘር	3	10	
16	ሰፈረ ገነት	3	10	
17	አንድነት	3	10	
18	ሰርቶ ማሳየት	4	10	
19	ተሻለና ጓድኞቹ	4	10	
20	ጽናት	5	10	
21	ሰላም	5	10	
22	ስራ ለለዉጥ	5	10	
23	ግሪን ቦዉ	6	10	
24	ጎዳናዉ አንድነት	6	10	
25	አንድነት	6	10	

26	መተባበር	6	10	
27	ህብረት እንደሰት	6	10	
28	ግሎ ወንዝ	7	10	
29	ገላሳ ሰፈር	7	10	
30	ኮከብ	8	10	
31	ጥረት በህብረት	8	10	
32	አድማስ	9	10	
33	ዉብ	9	10	
34	ዕድገት በቡድን	9	10	
35	አዲስ ራዕይ	10	10	
36	ድል በትግል	10	10	
37	የነገዉ ተስፋ	11	10	
38	ኢትዮጵያ ትቅደም	11	10	
39	ብርሃኔና ወርቄ	11	10	
40	ቀና	12	10	
41	ቅ/ሚካኤል	12	10	
42	ጎህና ህብረት	12	10	
43	ኮከብ	12	10	
44	በስራ እንለወጥ	12	10	

Annex VI Pictorial Overview

A)

B)

C) D)

Figure 5 A) Waste loading to the new comer (since September 2014) compactor car B) Routine on site activities C) On site data collection D) Sacks full of plastic highlands ready for sell