

**Reasons of Refusal of Indoor Residual Spraying of DDT for Prevention of
Kala Azar in Saran District, Bihar**

**Internship Training
at
CARE India
(January 27-April 30, 2014)**

**By
Vikram Jeet**

**Under the guidance of
Dr. Suresh Joshi**

**Post Graduate Diploma in Hospital & Health Management
2012–14**


**Institute of Health Management Research
Jaipur
2014**

**INSTITUTE OF HEALTH
MANAGEMENT RESEARCH**

1, Prabhu Dayal Marg
Sanganer Airport, JAIPUR - 302 029, INDIA
Tel. : 3924700, 2791431-32
Fax : 91-141-3924738
E-mail : iihmr@iihmr.org
URL : <http://www.iihmr.org>
Gram : HEALTHINST

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Vikram Jeet, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management Research, Jaipur has undergone internship training at CARE India from 27th January 2014, to 30 April 2014.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.



Col. (Dr.) Ashok Kaushik
Dean, Academics and Student Affairs
IHMR, Jaipur



Dr Suresh Joshi
Professor
IHMR, Jaipur



CARE INDIA

14, Patliputra Colony

Patna 800 013, Bihar

Tel +91-612-2274957, 2274389, 2270464

Fax +91-612-2274957

www.careindia.org

The Certificate is awarded to

Vikram Jeet

In recognition of having successfully completed his Internship at

CARE India

and has successfully completed his Project on

**Reasons of Refusal of Indoor Residual Spraying of DDT for Prevention of
Kala Azar in Saran District, Bihar**

He comes across as a Committed, Sincere & Diligent person who has a strong drive & zeal for learning

We wish him all the best for future endeavours

Taru

Manager HR & OD

Afaq Shah

Director-VL

**INSTITUTE OF HEALTH
MANAGEMENT RESEARCH**

1, Prabhu Dayal Marg

Sanganer Airport, JAIPUR - 302 029, INDIA

Tel. : 3924700, 2791431-32

Fax : 91-141-3924738

E-mail : iihmr@iihmr.org

URL : <http://www.iihmr.org>

Gram : HEALTHINST

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Reasons of Refusal of Indoor Residual Spraying of DDT for Prevention of Kala Azar in Saran District, Bihar** and submitted by **Vikram Jeet** Enrollment No. **17-1399** under the supervision of **Professor Suresh Joshi** for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from **27th January 2014** to **30th April** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Vikram Jeet

Acknowledgement

The internship was started with a vision to be able to learn about the practical aspects of healthcare delivery system in a detailed manner. I hereby take this opportunity to express my deep sense of gratitude to all those who have been instrumental in the successful completion of my internship. Any accomplishment requires efforts of various individuals and this work is no exception.

First of all, I would like to thank Dr. SD Gupta, Director - Institute of Health Management Research, Jaipur, and all the faculties, for the education imparted which has made me the person I am today, and CARE India for believing in my abilities.

This project would not have been completed without the tremendous contribution of my Guide, Professor Suresh Joshi right from the onset lending a helping hand at every step.

I am also thankful to my mentor Dr. Tanjul Saxena for always guiding me through difficulties. My guide and mentor have taken me through every obstacle throughout the two years of my course.

Mr Abhijeet Sinha, my supervisor and guide at CARE India, has been supportive all along my tenure in the organization and allowed me the freedom to express myself. I cannot forget to thank Mr. Manash Kumar, DPO-VL, my colleague, partner and friend who is always ready to help and the CARE BTSP Saran Team.

I express my heartfelt gratitude to Dr. BK Srivastava, District Malaria Officer, Saran and Mr. Sudhir Kumar Singh, VBD Consultant and all staffs of District Malaria Office, Saran who have been extremely welcoming and supportive.

I would also like to specially thank all the people of Saran district who showed interest in participating in the study and cooperated during the interview.

Finally, and most importantly, I would like to thank God for allowing me to complete my project, my beloved parents for their blessings and my friends for their help and wishes for the successful completion of this internship.

Vikram Jeet
17-1399, IHMR Jaipur

Table of Contents

S. No.	Contents	Page No.
1	Acknowledgement	v
2	List of Figures	ix
3	List of Tables	ix
4	List of Abbreviations	x
Part 2 : Dissertation Report		
2.1	Abstract	1
2.2	Background	2
2.3	Introduction	4
	2.3.1. Problem statement	6
	2.3.2. Research question	6
	2.3.3. Objective	6
	2.3.4. Rationale of the study	6
2.4	Review of literature	7
2.5	Methodology	9
	2.5.1. Study design	9
	2.5.2. Study location	9
	2.5.3. Study subjects	9
	2.5.4. Sampling technique	9
	2.5.5. Sample size	10
	2.5.6. Method and instrument of data collection	10
2.6	Ethical Consideration	10

2.7	Result	10
2.8	Discussion	19
2.9	Conclusion	23
2.10	References	25
Part 3: Annexure		
3.1	Annexure 1: Data collection tool	28
3.2	Annexure 2: Saran district profile	32

List of Figures

Figure No	Title of the Figure	Page No
2.1	Number of Kala-azar cases in Saran	4
2.2	Knowledge about kala-azar & IRS	12
2.3	Awareness across religion	12
2.4	Awareness across caste	13
2.5	Awareness across education level	13
2.6	Reason for doing IRS	14
2.7	Reason of refusal	15
2.8	Reason of refusal across type of house	16
2.9	Reason of refusal across caste	17
2.10	Decision making for spraying	18
2.11	Motivation for spraying	19
3.1	Map of Saran District	32

List of Tables

Table No.	Title of the Table	Page No.
2.1	IRS coverage in Saran district	5
2.2	Characteristics of study population	11

List of Abbreviations

ANC - ANE NATAL CARE

ANM - AUXILLARY NURSING MIDWIFE

ASHA - ACCREDIED SOCIAL HEALTH ACTIVIST

AWC - ANGANWADI CENTRE

AWW - ANGANWADI WORKER

BCC - BEHAVIOR CHANGE COMMUNICATION

BHM - BLOCK HEALTH MANAGER

BTAST - BIHAR TECHNICAL ASSISTANCE AND SUPPORT TEAM

DDT - DICHLORO DIPHENENYL TRICHLOROETHANE

DH -DISTRICT HOSPITAL

DPO - DISTRICT PROGRAM OFFICER

EBC - EXTREMELY BACKWARD CLASS

FLW – FRONT LINE WORKER

FW – FIELD WORKER

GOB – GOVERNMENT OF BIHAR

GOI - GOVERNMENT OF INDIA

HSC - HEALTH SUB CENTRE

ICDS - INTEGRATED CHILD DEVELOPMENT SERVICES

IDSP - INEGRATED DISEASE SURVELLIANCE PROJECT

IEC - INFORMATION EDUCATION COMMUNICATION

IFHI - INTERGRATED FAMILY HEALTH INITIATIVE

IRS - INDOOR RESDUAL SPRAYING

KA – KALA AZAR

KTS – KALA-AZAR TECHNICAL SUPERVISOR

LS - LADY SUPERVISOR

MI - MALARIA INSPECTOR

MOIC - MEDICAL OFFICER IN CHARGE

NVBDCP - NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAMME

OBC - OTHER BACKWARD CASTE

PHC - PRIMARY HEALTH CENTRE

PKDL - POST KALA AZAR DERMAL LIESHMANIASIS

PRI – PANCHAYATI RAJ INSTITUTION

RI - ROUTINE IMMUNIZATION

RMNCH+A - REPRODUCTIVE MATERNAL NEW BORN CHILD HEALTH +
ADOLESCENTS

RPM - REGIONAL PROGRAM MANAGER

SAM - SEVERE ACUTE MALNOURISHED

SDH - SUB DIVISIONAL HOSPITAL

SKAEP - STRENGTHENING OF KALA AZAR ELIMINATION PROJECT

SPSS - STATISICAL PACKAGE FOR SOCIAL SCIENCES

VHSND - VILLAGE HEALTH SANITATION AND NUTRITION DAY

VL - VISCERAL LIESHMANIASIS

PART-2

DISSERTATION REPORT

**Reasons of Refusal of Indoor Residual Spraying of DDT for
Prevention of Kala Azar in Saran District, Bihar**

2.1 Abstract

The Government of India aims to achieve kala-azar elimination by 2015. One of the major strategies to achieve this goal is reduction of vector density by means of indoor residual spraying of DDT twice a year in all the villages where kala-azar cases have been found in the last three years. The success of this strategy depends on the quality and coverage of spraying which means all the houses in the villages identified as kala-azar affected should be completely sprayed with right quantity of DDT following correct procedure. However, a large number of houses are left unsprayed because of refusal by household members which lead to decrease in coverage. A household based descriptive cross sectional study was carried out in Saran district of Bihar to find out the reasons behind high number of refusals for IRS. A total of 320 households from where refusal was reported were selected for the study from all the blocks. Data was collected through personally interviewing the member of households using semi-structured questionnaire as data collection tool. The results of this study suggest a complete lack of knowledge and awareness about kala-azar and IRS. Lack of prior information about spraying leads to making excuses by household members when spray squad visit their houses which is reflected in the results of this study. Thus lack of awareness and prior information about spraying are the underlying causes of refusal. Therefore, there is a need to carry out intensive awareness campaign and give prior information to the community about spraying through ASHA/AWW and by means of public address system. This study found that a significant number of respondents refused for spraying because they thought that DDT spraying was not effective. More research is required to study the effect of DDT on sandfly. There is a need for demand generation among community for indoor residual spraying by means of IEC and BCC to make it more acceptable among community.

2.2 Background

Visceral Leishmaniasis (VL) or more widely known as Kala-Azar is a slow progressing indigenous disease caused by a protozoan parasite of genus *Leishmania* (*L. Donovani* in *India*) and is transmitted by the sandfly *Phlebotomus argentipes*. It is the second largest parasitic killer in the world, only after malaria. It is one of the World's most neglected and poverty-related diseases, affecting the poorest people in developing countries associated with malnutrition, weakness of the immune system, displacement, poor housing, illiteracy, gender discrimination, and lack of resources. *Kala azar* is spread over a large geographical area across the globe with estimated yearly incidence of *Kala azar* of 500,000 cases¹ which lead to loss of nearly 2.4 million disability-adjusted life years (DALYs) each year. Since the last century several outbreaks of *Kala azar* have affected South-East Asia. Various programmes to control the disease have failed despite considerable efforts being done for prevention and control of the disease.

More than 60% of the world's VL cases are reported from India, Nepal and Bangladesh alone². In India, out of the four states where Kala Azar is prevalent i.e, West Bengal, Jharkhand, Bihar and Uttar Pradesh, Bihar contributes to more than 80% of the cases³, reason being its low economic status, thus increasing the vulnerability of poverty, which is one of the main factors responsible for the poor living conditions, leading to this deadly disease. Though the situation has improved over the years, still the poorest sections of the society e.g, the musahar tolas, BPL families, SC and ST populations and other marginalized populations are at a higher risk

2.2.1 Kala-Azar Control Program in India

The disease has been endemic in India for a long time and the earliest outbreaks

occurred in the early nineteenth century. Kala-azar used to occur in cyclical epidemics at the intervals of 10-15 years. With the launching of insecticidal spraying under National Malaria Control Programme/ National Malaria Eradication Programme in 1953 and 1958 respectively, the disease declined to negligible proportions as a result of the reduction of densities of the vector, *Phlebotomus argentipes*. Withdrawal of insecticidal spraying from erstwhile malaria endemic areas following successful malaria control resulted in a gradual build up of vector populations and renewed transmission of the disease. A resurgence of Kala-azar during 1970.s, initially in four district of Bihar followed and eventually engulfed the entire north Bihar, parts of south Bihar and several districts of West Bengal. The Kala-azar also began to be reported from erstwhile endemic districts of eastern Uttar Pradesh.⁴

Concerned with the increasing problem of Kala-azar in the country, Govt. of India launched a centrally sponsored Kala-azar Control Programme in 1990-91. The programme implementation was intensified during 1991 which brought about a reduction of morbidity and mortality due to kala-azar in Bihar and West Bengal. The programme implementation was not however, sustained by the concerned State governments resulting in a slower pace of decline in kala-azar incidence in the years following.

The Expert Committee on Kala-azar under the chairmanship of Director General of Health Services, Government of India reviewed Kala-azar Control Programme in the year 2000 and recommended feasibility of its elimination from the country. The National Health Policy, 2002 also endorsed the feasibility of elimination and envisaged Kala-azar Elimination by 2010. The Kala-azar elimination program was merged with

NRHM in 2005 under NVBDCP.

However, despite all such efforts by GoI, incidence of Kala-Azar is still high in most districts of Bihar and so Jharkhand. So GoI, has entrusted CARE, an international organization with the task of providing technical assistance and much needed human resource to help them achieve the goal of elimination of Kala-Azar by 2015. Thus CARE India has started a project named **Strengthening Kala Azar Elimination Programme (SKAEP)** funded by Bill and Melinda Gates Foundation to help GoI achieve its goal of elimination. The main focus of this project is on increasing the coverage and quality of the Indoor Residual Spraying through supportive supervision, detecting as many new cases of VL as possible by proper case detection, ensuring complete treatment course for patients, enhancing the knowledge and awareness of the community about Kala Azar and Indoor Residual Spraying through appropriate IEC/BCC.

2.3 Introduction

Saran which is one of the 11 high priority districts in Bihar for kala-azar contributes a large number of kala-azar cases thus having a significant burden of the disease.

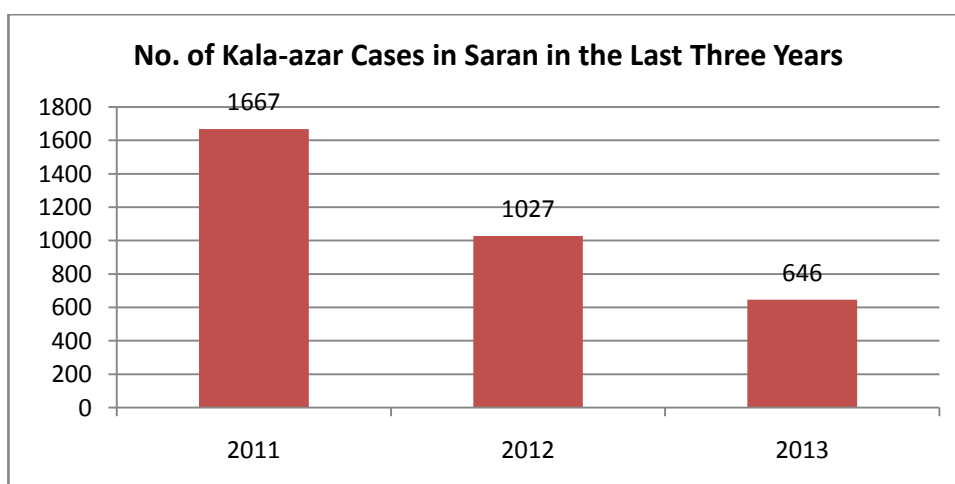


Figure 2.1 – No. of kala-azar cases in Saran (Source: Govt. Data)

According to government data there were around 1667 reported cases of kala-azar in 2011, 1027 cases in 2012, and 646 cases in 2013 (Fig-2.1). It cannot be denied that a large number of cases go unreported since all the kala-azar patients do not come to government hospitals for treatment and many go to neighbouring districts where better facilities for treatment are available.⁵ As per government data, around 50 percent of the total population of the district inhabiting more than 700 villages across all the 20 blocks

Table: 2.1: IRS Coverage in Saran District (Apr-2014)

BLOCK	TOTAL NO. OF AFFECTED VILLAGES	TOTAL NO. OF HOUSES SPRAYED	TOTAL NO. OF LOCKED HOUSES	TOTAL NO. OF REFUSALS	TOTAL HOUSES COVERED	HOUSES SPRAYED (%)	LOCKED HOUSES (%)	REFUSAL (%)
Rivilganj	15	3599	110	110	3819	94.24%	2.88%	2.88%
Manjhi	31	14674	338	442	15454	94.95%	2.19%	2.86%
Ekma	36	14569	286	299	15154	96.14%	1.89%	1.97%
Jalalpur + Nagra	49	20734	1226	947	22907	90.51%	5.35%	4.13%
Baniapur+ Lahladpur	80	29940	912	759	31611	94.71%	2.89%	2.40%
Marhaura	67	26473	725	1735	28933	91.50%	2.51%	6.00%
Amnaur	40	23663	442	1065	25170	94.01%	1.76%	4.23%
Mashrakh+ Panapur	67	28038	760	1018	29816	94.04%	2.55%	3.41%
Taraiya+ Ishuapur	70	28386	720	859	29965	94.73%	2.40%	2.87%
Sadar	18	9023	319	1364	10706	84.28%	2.98%	12.74%
Garkha	51	28135	1241	2337	31713	88.72%	3.91%	7.37%
Parsa + Maker	61	31332	449	837	32618	96.06%	1.38%	2.57%
Sonepur	29	14277	793	2540	17610	81.07%	4.50%	14.42%
Dighwara	22	20343	288	455	21086	96.48%	1.37%	2.16%
Dariyapur	65	31598	240	930	32768	96.43%	0.73%	2.84%
Chhapra Urban	21	11060	852	1251	13163	84.02%	6.47%	9.50%
TOTAL	722	335844	9701	16948	362493	92.65%	2.68%	4.68%

(Source: Primary data)

are affected by kala-azar. All the kala-azar affected villages undergo two rounds of IRS every year. Although, according to government data, the number of kala-azar cases has decreased but the elimination goal is still far from achievable. Despite IRS being carried out in the districts for decades, the transmission of disease through sandfly could not have been controlled. It was observed during the recent IRS that a large number of people had refused to get their houses sprayed with DDT. The below table shows an overall around five percent refusal in the district with minimum (2 %) refusal in Ekma block and maximum (14%) refusal in Sonapur block.

2.3.1 Problem Statement

High number of refusals of Indoor Residual Spraying of DDT leads to low coverage of spraying thus making the kala-azar elimination goal difficult to achieve.

2.3.2. Research Question

Why do people refuse to indoor residual spraying of DDT despite its being an important intervention for elimination of kala-azar?

2.3.3. Objective

The main objective of this study is to find out various reasons of refusal of indoor residual spraying of DDT.

2.3.4. Rationale of the Study

Indoor Residual Spraying of DDT is an extremely important intervention in achieving kala-azar elimination. To get optimum benefit of the strategy, it is important that

spraying is done in all the kala-azar affected villages covering all the houses in those villages which will lead to decrease in vector density. However, despite its importance, it was observed that a large number of people refused to get their houses sprayed with DDT. Therefore, it is of utmost importance to know the various reasons of refusal of indoor residual spraying of DDT to plan strategy to increase the coverage of IRS.

2.4 Review of literature

Shri P. Singh, Dandu C.S. Reddy, Rabindran N. Mishra and Shyam Sundar in their study titled, “Knowledge, Attitude, and Practices Related to Kala-Azar in a Rural Area of Bihar State, India”, concluded that although most of the people were aware of the protective role of mosquito nets, the role of insecticide spray was known to only one half of the population. This is a matter of concern because this makes the population indifferent to the public sector efforts of insecticide spray, even disallowing the sprayers entry into the house for flimsy reasons of inconvenience or bad odor, thus leading to inefficient spraying. An incomplete spray can be disastrous, leading to quick build up of the vector. A successful insecticide spray holds the key to the success of the control/elimination program, and the affected population has to be made aware of its importance.

In another study titled, “Risk Factors for Indian Kala-Azar” by Alok Ranjan et al, the authors found that the risk of kala-azar was higher among the family members residing in houses not sprayed with DDT compared with those living in houses sprayed with DDT. They mentioned this is as a very significant finding in the context of kala-azar control. However, they also mentioned that spraying with DDT as a long-term control

measure may have serious consequences such as harmful and long-lasting effects on the environment.

NA Siddiqui, Narendra Kumar, A Ranjan *et al* in their study titled, “Awareness About Kala Azar Disease and Related Preventive Attitudes and Practices in a Highly Endemic Rural Area of India” found that only 17.1% considered DDT spraying as a preventive measure. A possible explanation for this results may be loss of faith in DDT spraying due to its poor quality that they judged by the reduction in mosquitoes and sandflies bites or the resulting reduction in the number of mosquitoes and sandflies in the household. The respondents, who favored DDT spraying as precautionary measure to control kala-azar, surprisingly, were not aware that DDT or insecticides also kill sandflies. Therefore, the villagers need to be informed about the benefits and risk of DDT spraying, which would probably encourage other villagers also to have their houses sprayed.

According to a study “Knowledge about sandflies in relation to public and domestic control activities of kala-azar in rural endemic areas of Bihar. (Kumar N et al, J Commun Dis, June 2009) majority respondents were neither aware about the vector of kala-azar, nor they had any idea about transmission of the disease. About 61% had wrong impression that mosquitoes were causing kala-azar. Regarding knowledge about breeding and resting sites of vectors, 20% reported cattle shed, 16% crevices in the household followed by 15% damp dark places.

The study Knowledge, attitudes, and practices about kala-azar and its sandfly vector in rural communities of Nepal.(koirala et al, Bull wolrd Health Org, 1998) showed that The villagers had poor knowledge about the transmission of kala-azar, with most

villagers perceiving that mosquitos, instead of sandflies, were responsible for transmission of the infection. Most also failed to recognize the common symptoms of kala-azar.

Knowledge, attitude, and practices related to Kala-azar in a rural area of Bihar state, India. (Singh et al, Am J Trop Med Hyg. 2006 Sep) showed that a majority majority believed that the disease spreads by mosquito bites (72.8%). For 63.6%, the breeding site of the vector was garbage collection. Only 23.6% preferred the public health sector for treatment, and 55.9% believed that facilities at primary health centers are not adequate.

2.5. Methodology

2.5.1. Study Design

This was a household based descriptive cross sectional study.

2.5.2. Study Location

The study was conducted in Saran district of Bihar.

2.5.3. Study Subjects

Any adult member of the household which had refused for IRS

2.5.4. Sampling Technique

Stratified random sampling technique was used for the study. 4 villages were selected randomly from each of the 16 blocks and 5 households from each village were randomly selected. The households selected were those households which had refused for spraying.

2.5.5. Sample Size

A total of 320 households were selected for the study.

2.5.6. Methods and Instruments of Data Collection

Data was collected through personal interview using semi-structured questionnaire as data collection tool.

2.6. Ethical Considerations

Informed consent was taken before starting the interview. If anyone disagreed to become part of the data collection process they were not forced by any means. Confidentiality was ensured to all participants.

2.7. Results

2.7.1. Socio Demographic Characteristics of the Study Population

Most of the respondents (89 percent) were between 26 years and 65 years of age. About one third (33.1 percent) of the respondents were in the age group 36-45 years and nearly one fourth (24.4 percent) were between 46 years and 55 years. Majority of respondents (91 percent) were Hindus and only eight percent were Muslims. Nearly half of the respondents (49 percent) belonged to the OBC category followed by others (32 percent) and SC category (14 percent).

More than one fourth of the respondents (26 percent) did not have any education and another one fourth had secondary level of education (10-12 grade). One fifth of the respondents (20 percent) were educated upto middle level (6-9 grade) followed by primary education (15 percent). Only four percent of the respondents were postgraduates whereas nine percent of them were graduates.

Majority of the respondents (58 percent) lived in pucca houses followed by semi pucca and kachcha houses (26 and 16 percent respectively).

Table-2.2: Socio Demographic Characteristics of Study Population (n = 320)

Variables	Characteristics	Percentage of Respondants
Age	16-25 years	7.8
	26-35 years	15.6
	36-45 years	33.1
	46-55 years	24.4
	56-65 years	15.6
	66-75 years	2.5
	76-85 years	0.9
Religion	Hindu	90.9
	Muslim	8.4
	Others	0.6
Caste	Scheduled Caste	13.8
	Scheduled Tribes	2.8
	OBC	49.1
	Other	32.2
	EBC	1.2
	Don't Know	0.9
Education	No education	25.9
	Upto grade 5 (Primary)	15
	Grade 6-9 (Middle)	20
	Grade 10-12 (Secondary)	24.1
	Graduate	9.4
	Post Graduate	3.8
	Don't know/can't say	1.9
Type of House	Kachcha	16.2
	Semi Pucca	25.6
	Pucca	58.1

2.7.2. Knowledge about Kala-Azar & IRS (n = 320)

Only a small proportion of the respondents (11 percent) said that they knew about kala-azar and most of them associated it with high fever, cold, and weakness. Very few of them said that it spreads due to sandfly. Ninety nine percent of them said that they did not know about any kala-azar patient in their locality.

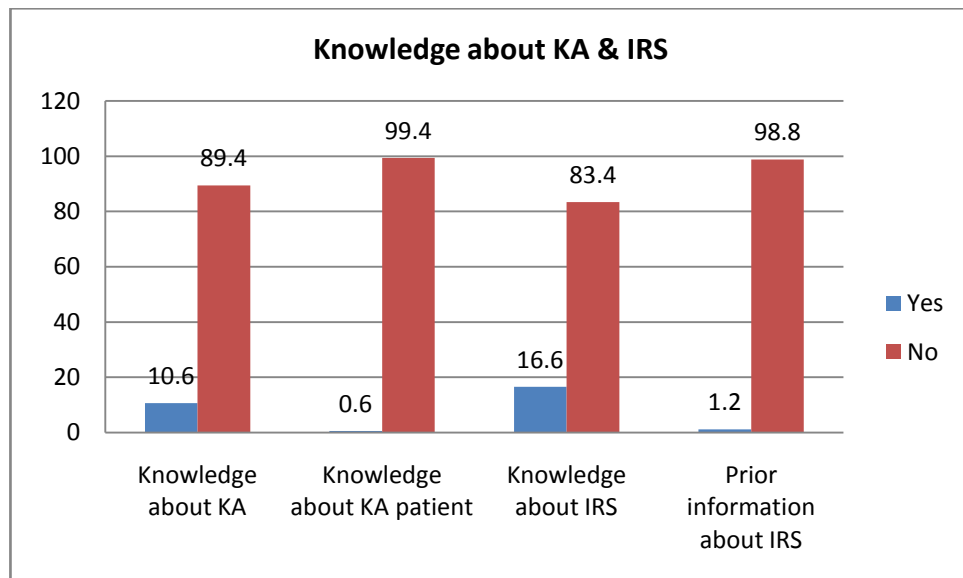


Figure 2.2 – Knowledge about Kala-Azar & IRS (n=320)

When asked whether they knew about indoor residual spraying or not, a large number of the respondents (83 percent) said that did not know about indoor residual spraying. A very small number of respondents (1 percent) said that they had prior information about spraying and they got the information either through the health worker or the IEC van.

Awareness about kala-azar and IRS was high among Hindus (16.8 and 11 percent respectively) in comparison to Muslim community (14.8 and 7.4 percent respectively).

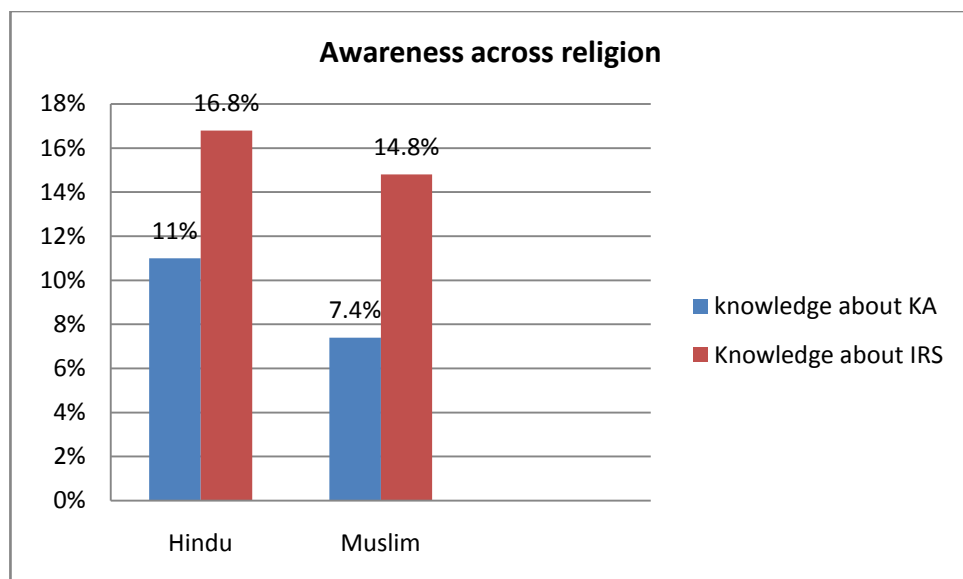


Figure 2.3 – Awareness across religion

Caste wise, more people in OBC category knew about kala-azar and IRS (19.1 and 14 percent respectively) followed by other castes category (18.4 and 9.7 percent). Awareness among SC category was lowest (6.8 percent knew about kala-azar and 4.5 percent about IRS). Surprisingly, awareness about kala-azar was high among ST category but none of them knew about IRS.

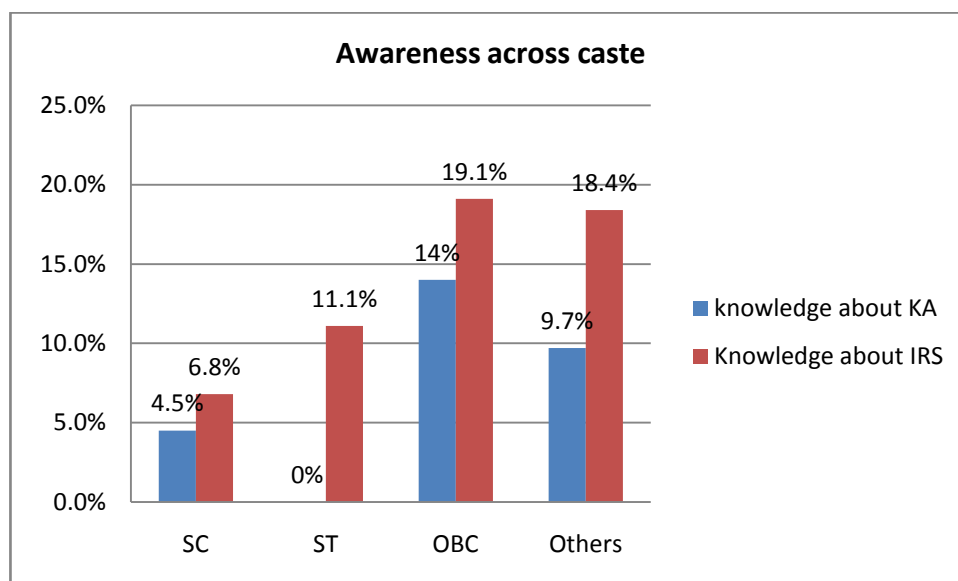


Figure 2.4 – Awareness across caste

Awareness about kala-azar and IRS was highest among graduates and postgraduates.

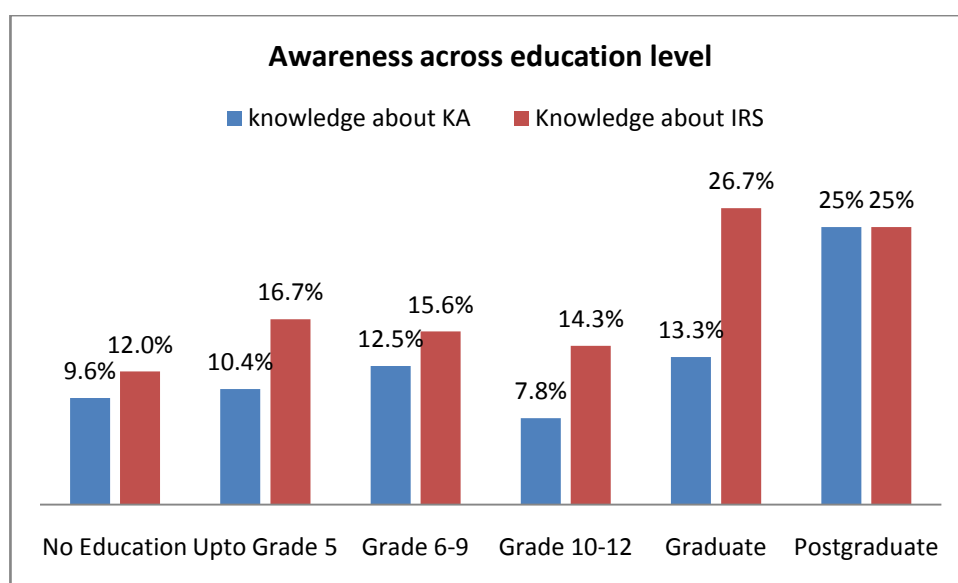


Figure 2.5 – Awareness across education level

Twenty five percent of postgraduates knew about kala-azar and a same percentage knew about IRS. Among graduates, about 27 percent knew about kala-azar and 13 percent knew about IRS. Similar level of awareness was seen among primary, middle and secondary level of education. Awareness about kala-azar and indoor residual spraying was lowest among people with no education.

2.7.5. Reason for doing IRS (n = 320)

More than half of the respondents (58 percent) thought that indoor residual spraying was done to prevent malaria and less than one third of them (31 percent) said that it was done to prevent Kala Azar. A small proportion of them (11 percent) said that indoor residual spraying was done for Dengue.

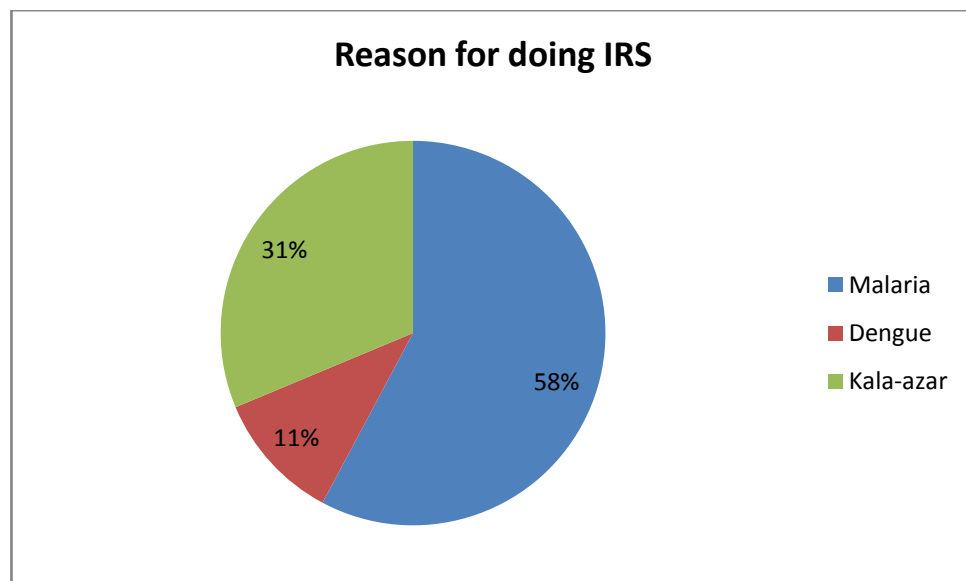


Figure 2.6 – Reason for doing IRS (n=320)

2.7.6. Reasons of refusal

This was an open ended question and the various reasons given by the respondents were recorded and similar responses were grouped together for analysis. The most common

reason given was that the wall would become dirty (34 percent) since the DDT spraying leaves a white residue on the wall. Ten percent of the respondents did not get their houses sprayed because they thought that it was not effective and few of them (0.6 percent) were suspicious of the quality of DDT. This was followed by the reason that the room was filled with items (9 percent). Interestingly, marriage ceremony was the fourth most common reason (8 percent) given for refusal. Many of the respondents (7.5 percent) did not give any specific reason for refusal and few of them (2 percent) said that they do not require it. About seven percent of the respondents (probably female) said that they refused for spraying because they were alone and no male member of the family was present at the time of spraying. About four percent of the respondents refused for spraying because they did not like the smell of DDT and the same number of respondents said that since they did not had the prior information about the spraying, they were not ready for it. Few of the respondents (3 percent) said that since they were living in pucca houses, therefore they did not need it. Very few of the respondents (2

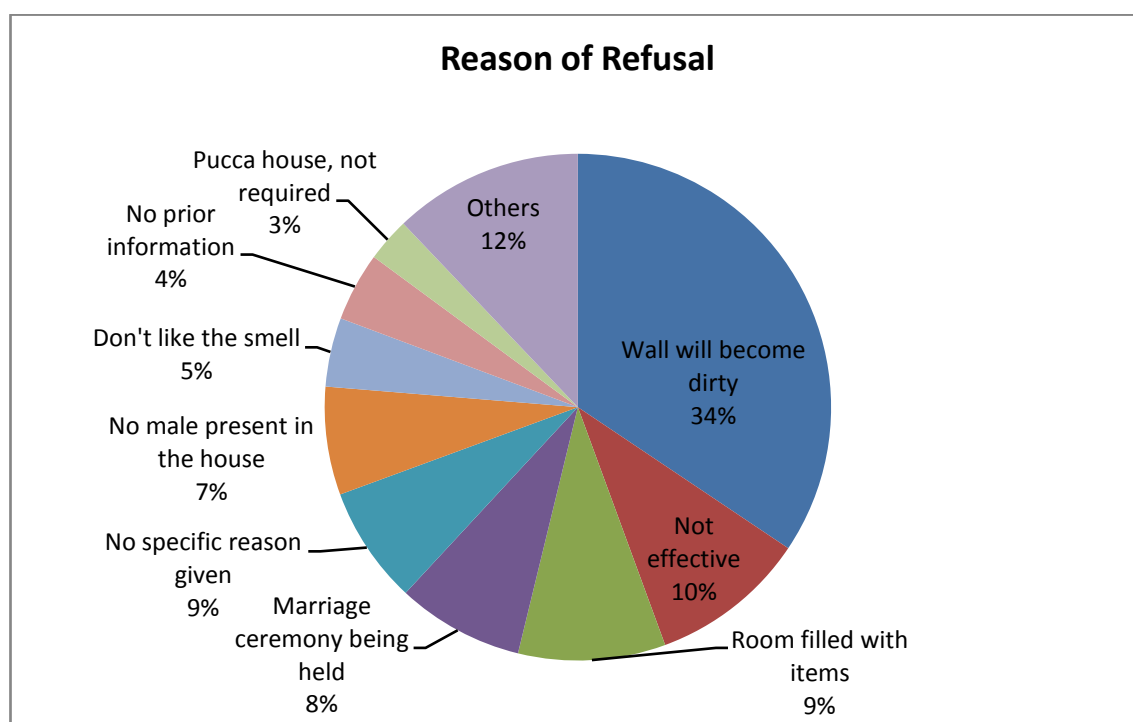


Figure 2.7 – Reason of refusal (n=320)

Forty two percent of respondents living in pucca houses said that wall will become dirty because of DDT spraying, followed by 31 percent living in semi-pucca houses and 12 percent living in kachcha houses. Fourteen percent of respondents living in kachcha houses thought that DDT was not effective, followed by those living in pucca and semi-pucca houses (10 and 9 percent respectively). Fourteen percent of respondents living in kachcha houses refused because their room was filled with items, followed by about nine percent each living in pucca and semi-pucca houses. Twelve percent of respondents living in kachcha houses refused for spraying because of marriage ceremony being held followed by eight percent living in pucca houses and seven percent living in semi-pucca houses. About 10 percent of respondents living in kachcha houses did not give any specific reason for refusal followed by about nine percent living in pucca houses and about four percent living in semi-pucca houses. Twelve percent of those living in semi-pucca houses refused for spraying because no male member was present at that time followed by eight percent living in kachcha houses and four percent living in pucca houses. Seven percent of respondents living in semi-pucca houses

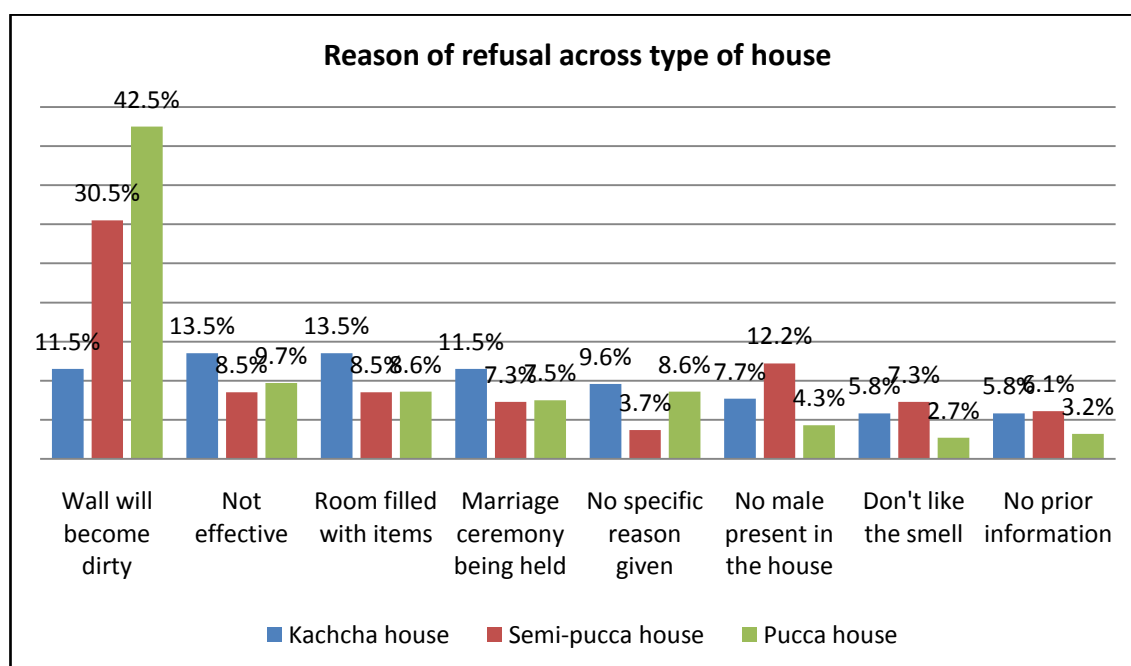


Figure 2.8 – Reason of refusal across type of house

refused because they didn't like the smell of DDT followed by two percent living in kachcha houses. Eleven percent of the respondents living in kuchcha houses refused for spraying because they were not informed about spraying in advance followed by four percent living in semi-pucca houses and two percent living in pucca houses.

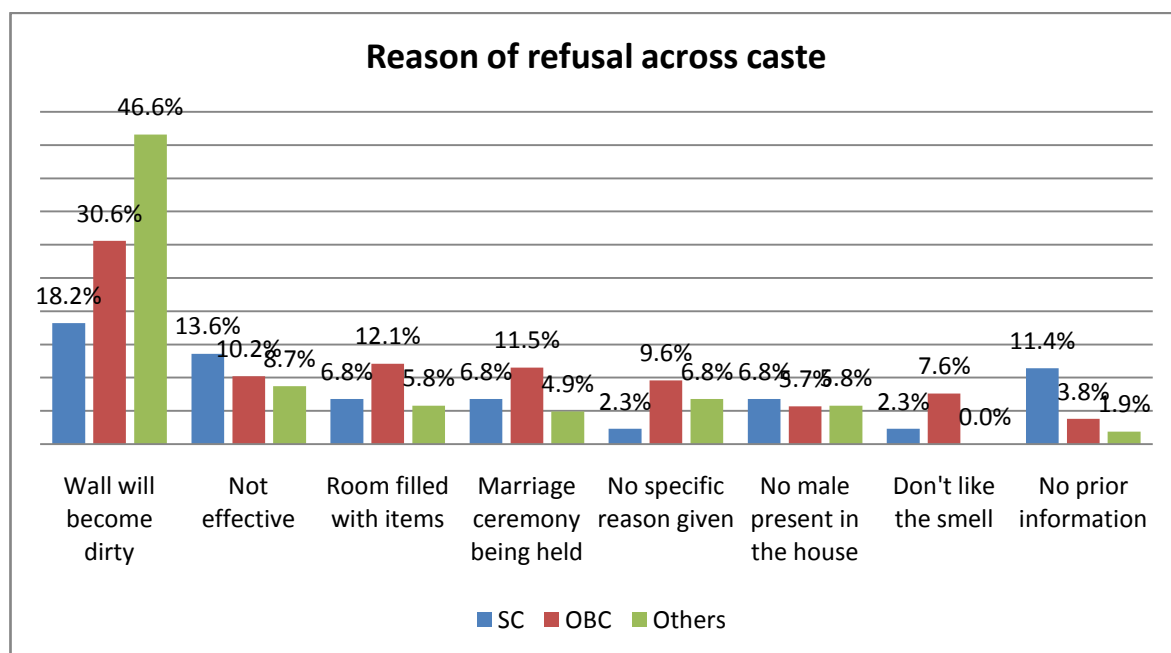


Figure 2.9 – Reason of refusal across caste

About 47 percent respondents belonging to other castes category gave the reason that wall would become dirty because of spraying, followed by 31 percent belonging to OBC category and 18 percent belonging to SC category. About fourteen percent belonging to SC category thought that the spraying was not effective, followed by 10 percent of OBC and about nine percent of other caste category. Twelve percent of respondents belonging to OBC category refused because their rooms were filled with items, followed by seven percent of SC and six percent of other castes category. Nearly twelve percent of OBC category refused because of ongoing marriage ceremony, followed by seven percent of SC and five percent of other castes category. About 10

percent belonging to OBC category refused for no specific reason, followed by seven percent belonging to other castes category and two percent of SC category. Nearly seven percent of SC category refused due to absence of male member in the house, followed by six percent each belonging to OBC and other caste categories. About eight percent of OBC category refused because of bad smell of DDT followed by nearly two percent belonging to SC category. Nobody from other caste category gave this reason. About 11 percent of respondents from SC category said that they refused because they didn't had prior information about spraying, followed by four percent from OBC category and nearly two percent from other caste category.

2.7.7. Decision making for spraying (n = 320)

To the question that whether it was his/her decision to refuse for spraying, a majority of them (76 percent) said that it was their own decision to refuse for spraying. When asked whether they would agree for the IRS next time, most of them (64 percent) said that they would agree.

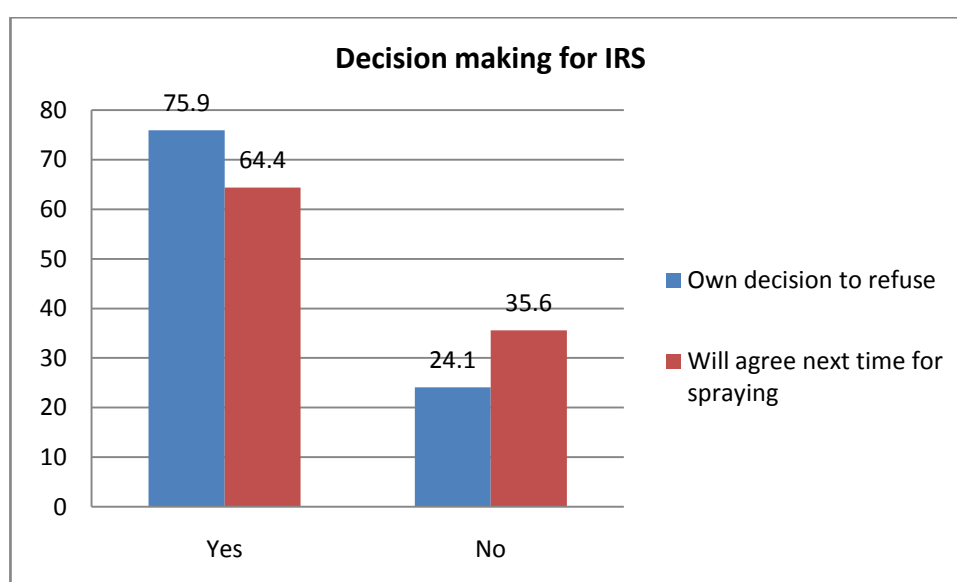


Figure 2.10 – Decision making for spraying (n=320)

2.7.8. Motivation for spraying (n = 320)

To the question that whether anybody tried to motivate them for spraying, more than half of the respondents (56 percent) said that NGO staff (KLW) had tried to motivate them for spraying and about one third of the respondents (35 percent) said that it was the member of spray squad who had tried to motivate them. Three percent of them were approached by PRI members to get the spraying done whereas six percent of them said that nobody tried to motivate them. Involvement of health workers (ASHA/ANM) in trying to motivate them for spraying was negligible.

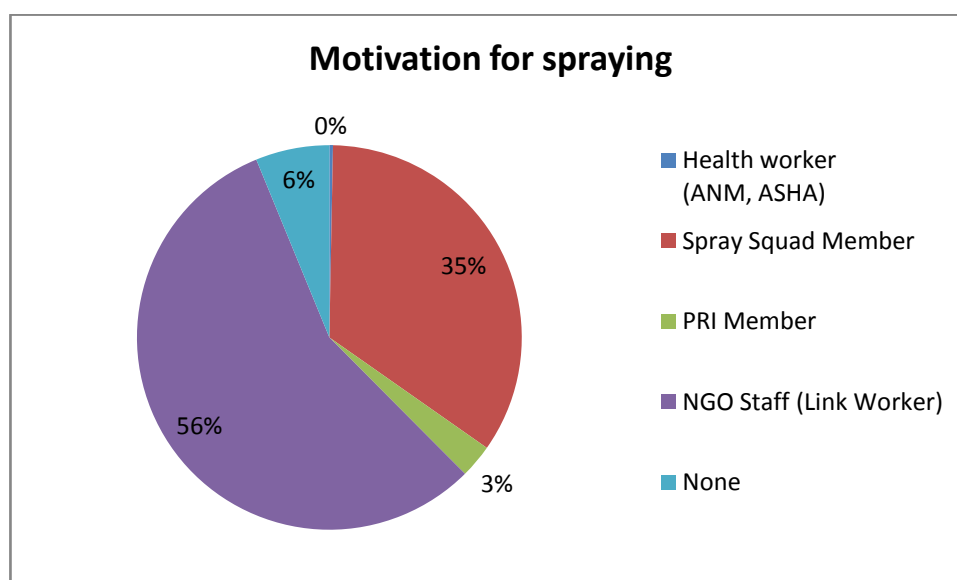


Figure 2.11 – Motivation for spraying (n=320)

2.8. Discussion

This study covered 320 households in 15 blocks and the urban area of Saran district. Twenty households from each block were selected for the study. Only those households were selected for the study from where refusal was reported. Most of the respondents belonged to the working age group. Nearly half of them belonged to the OBC category. The data on educational status of respondents suggests low level of literacy among

them. The proportion of Hindus and Muslims among respondents (91 and 8 percent respectively) were commensurate with their total population in the district (87 and 10 percent respectively). Majority of the respondents lived in pucca houses which suggest a relatively better economical condition.

It is surprising that 89 percent of the respondents did not know about kala-azar, considering the fact that the disease has been endemic in the district for decades and so many cases have been reported over the time. Same is the case with indoor residual spraying of DDT. Eighty three percent of the respondents said that they did not know about IRS. This indicates a complete lack of awareness about kala-azar and IRS in the district. Lack of awareness about insecticide spray is a matter of concern, because this makes the population indifferent to the public sector efforts of insecticide spray, even disallowing the sprayers entry into the house for flimsy reasons of inconvenience or bad odor, thus leading to inefficient spraying¹³.

Except few, all the respondents said that they did not get prior information about spraying. Here prior information means that the community has to be informed about the date of spraying in their locality, necessary preparations to be done before spraying

and precautions to be taken during spraying at least one day in advance. This is important, because ideally the spraying should be done on all the walls inside the house. For proper spraying, it is required that all the items from the wall are removed and furniture is moved out of the room so that the full surface of the wall is exposed for spraying. Now, in villages most of the houses have small rooms which are generally stuffed with furniture, clothes, agricultural and sundry items. Moving them requires

time and effort. Unless they have been informed about the spraying well in advance, one cannot expect them to keep their houses ready for spraying. Therefore, when spray squad visits their houses for spraying they either refuse or make petty excuses when insisted or allow the spray worker to spray partially, most of the time outside their houses. An incomplete spray can be disastrous, leading to quick build up of the vector. A successful insecticide spray holds the key to the success of the control/elimination program, and the affected population has to be made aware of its importance¹³. Thus giving prior information to the community about spraying is very important for complete and successful spraying. This can be done by involving ASHA/AWW and by making announce through public address system in the affected villages one before the scheduled date of spraying. Having said that, whether the number of refusal after giving prior information actually goes down or not, is a topic for further study.

A significant number of respondents (31 percent) said that indoor residual spraying is done to prevent kala-azar which is not consistent with the other findings of this study on knowledge about kala-azar and IRS where 89 percent and 83 percent of respondents said that they did not know about Kala-azar and IRS respectively. However, rest of the respondents associated indoor residual spraying with malaria (58 percent) and dengue (11 percent). This may be due the fact that most of the people perceive indoor residual spraying to be associated with killing mosquito which in turn is associated with malaria and dengue. This finding is important, because, if sandflies are not perceived to be important in the transmission of kala-azar, they may not act appropriately to protect themselves against their bites. Therefore, there is a need to make the community aware about the vector and to take necessary precaution against them.

The objective of the study was to find out various reasons of refusal for indoor residual spraying of DDT in Saran district of Bihar. However, most of the reasons given by the respondents sound like excuses rather than genuine reasons. The most common reason for refusal was that the wall would become dirty due to spraying. This is true since DDT gets deposited on the surface of the wall in the form of white residue which does not look good. Spraying with DDT as a long-term control measure may have serious consequences such as harmful and long-lasting effects on the environment¹⁷. Also, it has been found in some studies that sandfly is becoming resistant to DDT¹⁸. Therefore, malathion paint, a slow-release emulsified suspension, has been shown to be a suitable alternative for vector control in terms of toxicity, effectiveness, and operational cost¹⁹.

Another reason given was that spraying of DDT was not effective. A possible explanation for this result may be the loss of faith in DDT spraying due to its poor quality that they judged by the reduction in mosquitoes bites or the resulting reduction in the number of mosquitoes in the household. Since sandfly is hardly visible with naked eyes and bite only during midnight, they do not perceive the reduction in its number which results due to spraying. Thus they are not able to associate the effectiveness of DDT spraying with reduction in sandfly number or its bite. Since DDT 50% is used to kill sandfly which is not potent enough to kill mosquitoes, they perceive it as ineffective.

Three fourth of the respondents (76 percent) said that it was their own decision to refuse for spraying. This clearly indicates that it is not only the head of the household who decides whether to get their houses sprayed or not.

When the respondents were asked if anybody tried to convince them for spraying, 56 percent of them said that the NGO staff tried to convince them. Here, the NGO staffs are the Kala-azar Link Workers (KLW) who have been deployed by CARE India to monitor the quality of IRS and provide supportive supervision. Rest of them were approached either by spray squad member (35 percent) or PRI member (3 percent). Involvement of health worker (ASHA/ANM) in convincing them was negligible. Only six percent of the respondents said that nobody tried to convince them. Thus, 94 percent of them were approached by somebody who tried to convince them to get their houses sprayed but none of them got convinced. This finding is important, because, it suggests that they might have pre determined not to allow spraying in their houses. The possible reason for this may be that in their views the inconvenience caused due to the spraying weighs more than its benefits which they are not able to perceive due to lack of knowledge and awareness about kala-azar and IRS.

It is interesting that nearly two third (64 percent) of the respondents said that the next time they will agree for IRS. Whether they will actually agree or not will be known only in the time to come.

2.9. Conclusion

This study was carried out with an objective to find out various reasons of refusal for indoor residual spraying of DDT which is carried out to stop transmission of kala-azar through sandfly by reducing its density. However, most of the reasons given by the respondents sound like excuses rather than genuine reasons. The results on knowledge about kala-azar and IRS are surprising and indicate a complete lack of awareness in the community about kala-azar and IRS. This lack of knowledge about kala-azar and IRS

may be the one of the reasons behind the refusals. Another reason for refusal may be lack of prior information about spraying which lead to making excuses by the household members when spray squad visits their houses. Whether increase knowledge and awareness and giving prior information actually translate into less number of refusals or not, can be the topic for further study. There was a perception among significant number of respondents that the indoor residual spraying of DDT was not effective. The only evidence in favour of DDT being used for kala-azar elimination is the past experience during 1950s when kala-azar was virtually eliminated as a result of intensive spraying of DDT under Malaria Control Program. There is a need for more research to find out the effect of DDT on sandfly. Also there is a need to look for a suitable alternative for vector control in terms of toxicity, effectiveness, acceptability and operational cost.

2.10 References

1. Joshi A. Kala-azar status in SEA Region. Current disease burden. New Dehli: WHO SEARO, 2008. [Cited 2008 Dec 8]. Available from: URL: http://www.searo.who.int/EN/Section10/Section2163_11668.html
2. WHO Report of the First Meeting of Regional Technical Advisory Group on Kala-Azar Elimination, 2004
3. Guerin P., Oliaro P, Sundar S, *et al.* Drugs for the treatment of visceral leishmaniasis: Current status, needs and a proposed R&D agenda. MSF/DND working group, 2002: 25-28.
4. NVBDCP Guidelines on Vector Control in Kala-Azar Elimination.
5. Singh SP, Reddy DC, Rai M, Sundar S. Serious underreporting of visceral leishmaniasis through passive case reporting in Bihar, India. *Trop Med Int Health* 2006b; 11: 899-905.
6. Sunder S, More DK, Singh MK, *et al.* Failure of pentavalent antimony in visceral leishmaniasis in India: report from the center of the Indian epidemic. *Clin Infect Dis* 2000; 31: 1104-7.
7. Anette Stauch , Ram Rup Sarkar , Albert Picado, Bart Ostyn, Shyam Sundar, Suman Rijal, Marleen Boelaert, *et al.* Visceral Leishmaniasis in the Indian Subcontinent: Modelling Epidemiology and Control.
www.plosntds.org/article/info%3Adoi%2F10.1371%2Fjournal.pntd.0001405
8. World Health Organization, 1996. *Manual on Visceral Leishmaniasis Control*. Geneva: Division of Control of Tropical Diseases.
9. Kumar N, Siddiqui NA, Singh VP, Verma RB, Bhattacharya SK, Das P. Grass-root level functionaries of kala-azar in Bihar. Chandigarh: Proceedings of the 31st Annual National Conference of Indian Association of Preventive and Social Medicine at PGIMER, 2004: 169.
10. Knowledge about sandflies in relation to public and domestic control activities of kala-azar in rural endemic areas of Bihar. (Kumar N et al, J Commun Dis, June 2009)
11. Awareness About Kala Azar Disease and Related Preventive Attitudes and Practices in a Highly Endemic Rural Area of India (NA Siddiqui et al, Southeast Asian J Trop Med Public Health, Vol 41 no 1, Jan 2010)
12. The study Knowledge, attitudes, and practices about kala-azar and its sandfly vector in rural communities of Nepal.(koirala et al, Bull wolrd Health Org, 1998)
13. Knowledge, attitude, and practices related to Kala-azar in a rural area of Bihar state, India. (Singh et al, Am J Trop Med Hyg. 2006 Sep)
14. India. Rajendra Memorial Research Instiute/Indian Council of Medical Research. Training Manual on Kala Azar (Technical Supervisor)
15. www.saran.bih.nic.in
16. Ahluwalia IB, Bern C, Costa C, *et al.* Visceral leishmaniasis: consequences of a neglected disease in a Bangladeshi community. *Am J Trop Med Hyg* 2003; 69: 624-8.

17. Thakur CP, 2000. Socio-economies of visceral leishmaniasis in Bihar (India). *Trans R Soc Trop Med Hyg* 94: 156–157.
18. Ostyn B, Vanlerberghe V, Picado A, Dinesh DS, Sundar S, Chappuis F, *et al.* Vector control by insecticide-treated nets in the fight against visceral leishmaniasis in the Indian subcontinent, what is the evidence? *Trop Med Int Health* 2008; 13 : 1073-85.
19. Lal CS, Kumar V, Ranjan A, Das VNR, Kumar N, Kishore K, Bhattacharya SK, 2004. Evaluation of cholinesterase level in an endemic population exposed to malathion suspension formulation as a vector control measure. *Mem Inst Oswaldo Cruz* 99: 219–221.
20. Hongvivatana T, Leerapan P, Smithisampan M. An observational study of DDT house spraying in rural areas of Thailand. *J Trop Med Hyg* 1982; 85: 245-50.
21. Bora D, 1999. Epidemiology of visceral leishmaniasis in India. *Natl Med J India* 12: 62–68.
22. Koirala S, Parija SC, Karki P, Das ML. Knowledge, attitudes and practices about kalaazar and its sand fly vector in rural communities of Nepal. *Bull World Health Organ* 1998; 76: 485-90.
23. Kumar V, Kesari S, Kumar AJ, Dinesh DS, Ranjan A, Prasad M, Sinha NK, Kumar R, Das P. Vector density and the control of kala-azar in Bihar, India. *Mem Inst Oswaldo Cruz*. 2009 Nov; 104(7):1019-22.
24. Albert Picado, Aditya P. Dash, Sujit Bhattacharya & Marleen Boelaert. Vector control interventions for visceral leishmaniasis elimination initiative in South Asia, 2005-2010. *Indian J Med Res* 136, July 2012, pp 22-31
25. Arti Gupta, Mukesh Nagar, Sidharth Sekhar Mishra and Chandrakant Lahariya. Visceral Leishmaniasis (Kala Azar) Elimination from Indian Sub-continent by 2015. *International Journal of TROPICAL DISEASE & Health* 3(2): 73-81, 2013
26. Indicators for Monitoring and Evaluation of the Kala-azar Elimination Program. WHO. August 2010.

PART- 3

ANNEXURE

3.1. Annexure 1: Data Collection Tool

English Questionnaire

REASON OF REFUSAL OF INDOOR RESIDUAL SPRAYING OF DDT

Informed consent: I would like to thank you for taking the time to respond me. My name is _____. I would like to talk to you about IRS. There are no direct benefits for you a part of this research. However your contribution will help the Kala-Azar control program and the department of health to design and develop appropriate information resources to help reduce the refusal rate of spraying. The interview should take about 10 minutes. The responses will be kept confidential. This means that the interview responses will be shared only with the research team and we will ensure that any information that we include in our report does not identify you as the respondent. Remember, you don't have to talk about anything that you don't want to and you can end the interview at any time.

Do you have any questions about what I just explained?

Are you willing to participate in the interview? (If the answer is no, then terminate the interview and move to the next house)

BLOCK	
HEALTH SUB CENTRE	
PANCHAYAT/ VILLAGE	
DATE OF INTERVIEW	
DURATION OF INTERVIEW	

Section-A: Background Characteristics			
Q. NO.	QUESTIONS	CODING CATEGORIES	SKIP
A.1	What is your name?		
A.2	How old are you? (Record the age in completed years)		
A.3	Religion of the household	Hindu1 Muslim.....2 Christian.....3 Other.....4	

A.4	Caste or Tribe	SC.....1 ST.....2 OBC.....3 EBC.....4 Other.....5 Don't know.....98	
A.5	Education (Self)	No education.....1 Grade 5 (Primary).....2 Grade 6-9 (Middle).....3 Grade 10-12 (Secondary)...4 Graduate.....5 Post Graduate.....6 Don't know.....98	
A.6	Type of house (Observe)	Kachcha.....1 Semi Pucca.....2 Pucca.....3	
Section-B: Kala-azar, Indoor Residual Spraying, Reason of Refusal			
B.1	Do you know about kala-azar?	Yes.....1 No.....2	If no, then go to Q. No. B.3
B.2	What do you know about kala-azar? (Open ended – Record what the respondent have to say)		

B.3	Do you know about any kala-azar patient in your locality?	Yes.....1 No.....2	
B.4	Do you know about IRS?	Yes.....1 No.....2	If no, then go to Q. No. B.7
B.5	Do you know why IRS is done?	Yes.....1 No.....2	If no, then go to Q. No. B.7
B.6	IRS is done for which reason?	Malaria.....1 Dengue.....2 Kala-azar.....3	
B.7	Had anyone come to your house for spraying?	Yes.....1 No.....2	
B.8	Did you have prior information about spraying?	Yes.....1 No.....2	
B.9	How were you informed about spraying? (Open ended – Record what the respondent have to say)		
B.10	Did you agree for spraying?	Yes.....1 No.....2	If yes, then go to Q. No. B.15
B.11	What was the reason for refusal? (Open ended – Record what the respondent have to say)		

B.12	Was it your own decision not to get your house sprayed?	Yes.....1 No.....2	
B.13	Did anyone try to convince you for spraying?	Yes.....1 No.....2	If no, then go to Q. No. B.15
B.14	Who tried to convince you?	Health Worker.....1 Spray Squad Member.....2 PRI Member.....3 NGO Staff.....4	
B.15	Will you agree for IRS next time?	Yes.....1 No.....2	

Thank you for your time and valuable contribution. Do you have any question for me?

Name of the interviewer_____

Signature of the interviewer_____

3.2. Annexure 2: Saran District Profile

3.2.1. About the District

Saran District is one of the thirty-eight districts of Bihar. The district is a part of Saran Division, is also known as Chapra district after the headquarters of the district - Chapra. Saran district occupies an area of 2,641 square kilometers (1,020 sq mi), there are a few villages in saran which are known for its historical and social significance.

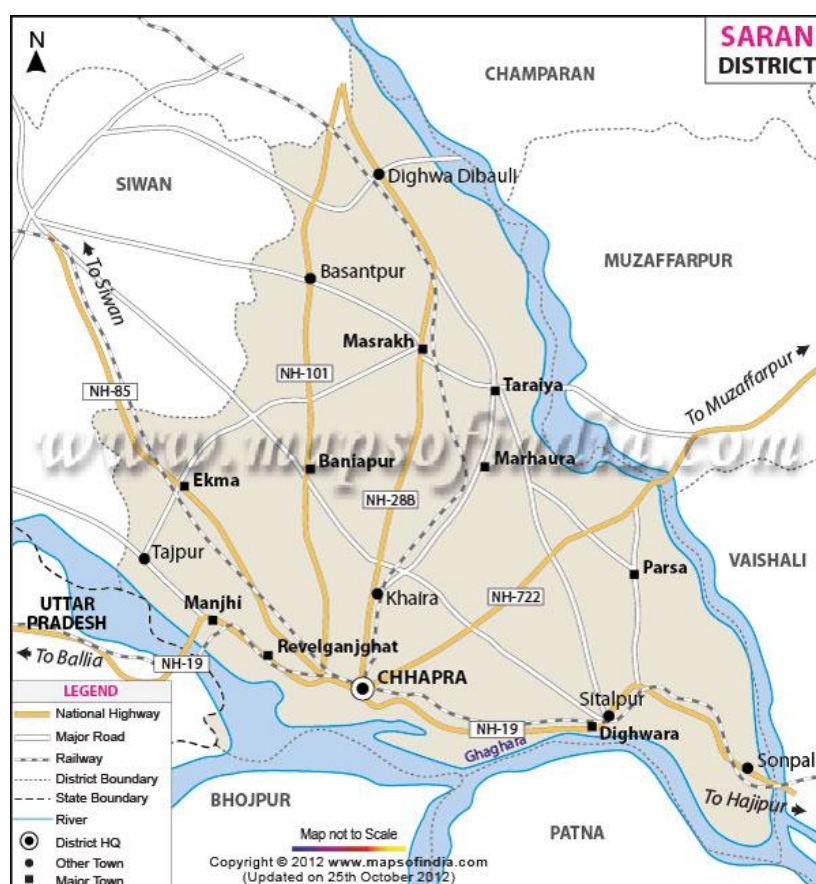


Figure 3.1 – Map of Saran District

3.2.2. Geographical Location

Saran district is situated between 25°36' to 26°13' North latitude and 84°24' to 85°15' East longitude in the southern part of the newly created Saran Division of the North Bihar. The Ganges constitute the southern boundary of the district beyond which lie the districts of Bhojpur and Patna. To the north of Saran lie districts of Siwan and

Gopalganj. The Gandak river forms the dividing line with Vaishali and Muzaffarpur districts in the east. To the west of Saran lies district of Siwan and the district of Balia in Uttar Pradesh, river Ghaghra constituting a natural boundary between Saran and Balia.

3.2.3. Administrative Setup

Saran district comprises of three Sub-divisions – Chapra, Marhaura and Sonepur.

It is divided into 20 Blocks – Chapra Sadar, Manjhi, Dighwara, Rivilganj, Parsa, Baniapur, Amnaur, Taraiya, Sonepur, Garkha, Ekma, Dariyapur, Jalalpur, Marhaura, Masarakh, Maker, Nagra, Panapur, Eisuapur, and Lahladpur.

3.2.4. Health Care Setup

The district has one District Hospital, one Sub-divisional Hospital, three Referral Hospitals, 20 PHCs, 43 Additional PHCs, 413 Health Sub Centers and one Woman Hospital.

3.2.5 Demographic profile

Highlights of Census 2011

- In 2011, Saran had population of 3,951,862 of which male and female were 2,022,821 and 1,929,041 respectively.
- There was change of 21.64 percent in the population compared to population as per 2001.
- The district has a population density of 1,496 inhabitants per square kilometer.
- Average literacy rate of Saran in 2011 were 65.96 compared to 51.80 of 2001. If things are looked out at gender wise, male and female literacy were 77.03 and 54.42 respectively.

- With regards to Sex Ratio in Saran, it stood at 954 per 1000 male compared to 2001 census figure of 966. In 2011 census, child sex ratio is 926 girls per 1000 boys compared to figure of 949 girls per 1000 boys of 2001 census data.
- About 91 percent population of Saran lives in rural areas.
