Summer Training at

Directorate of health services Goa

Impact of Long Lasting Insecticidal Nets on Malaria Control among Migrant Construction Workers-A High Risk Group in Goa

By
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Under the Guidance of
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Post Graduate Diploma in Hospital and Health Management
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Institute of Health Management Research,
Jaipur
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Certificate

This is to certify that Dr Nisha Singh has undergone summer training in Directorate of Health Services Goa, in National Vector Borne Disease Control Department from 9th April 2012 to 21st May 2012

The candidate has herself carried out all studies related to summer training; her approach to studies has been sincere, scientific and analytical. This summer training is one of the requirements for the award of Post Graduate Diploma in Hospital Health Management

P.R.Sodani
Dean (Academic and Students Affair)

Arindam Das
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GOVERNMENT OF GOA

DIRECTORATE OF HEALTH SERVICES

CAMPAL-PANAJI-GOA

Certificate

This is to certify that **Dr. Nisha Singh**, of PGDHM (2012), Institute of Health Management Research, Jaipur has successfully completed the summer Training Programme from **9th April to 1st June 2012 at Directorate of Health Services, Government of Goa.**

During the training period she single handedly carried out a project study on Impact of LLIN's in Control of Malaria along with learning the Healthcare delivery system of state of Goa.

We highly appreciate the quality of her work and acknowledge the sincerity and conduct displayed by her.

We Wish her success in all her future endeavors.

Dr. Utkarsh Betodkar
State Epidemiologist
Directorate of Health Services

Dated:- 24/12/2012

ACKNOWLEDGEMENT

I would like to express a sincere vote of thanks to Dr P.R.Sodani Professor and Dean (Training) for providing me this golden opportunity to work with Government of Goa as a part of my summer training and Dr. Sanjiv Dalvi, Director, Dr (Mrs.) Rajnanda Desai, Former Director, Directorate of health Services(DHS) , Goa for giving us the opportunity to do our summer internship at Directorate of Health Services Goa. Also I would like to thank my mentors Dr. Utkarsh and Dr. Shraddha for facilitating our internship and for providing us the needful as and when required.

The project assigned to me by Desai madam has enhanced my research skills and given me an opportunity to put my learning into practicality. The support and guidance of Mr. Dr. Anant Palekar, Head of National vector borne disease control program (NVBDCP) department and my mentor at DHS as well as Dr. Ashwani kumar Officer-in-charge at National Institute of Malaria Research (Goa) has kept me on the right track throughout the project.

I also got an opportunity to understand the functioning of the departments in DHS including those coming under NRHM for which I am grateful to their respective heads.

I express my gratitude to all the officials at different health centres in Goa along with diabetic educators for cooperating and coordinating during my field work.

Finally, I am grateful to Dr Shilpi Mishra Sharma, my mentor at IIHMR for advising me and correcting me at each step of my project, Dr Arindham Das for helping me in statistical analysis and also the faculty of IIHMR, Jaipur for making me competent enough to understand the functioning of the health sector.

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PREFACE

Summer internship is an integral part of the PGDHM curriculum. As a part of the course; students of first year are required to undergo summer training at an organization to get in depth exposure of various departments in the organization and better understanding of the health care delivery system.

The major objectives of the summer training program are as follows:

1) To better understand the existing health delivery system including public and private sectors.
2) To observe the implementation of various National Health Programmes at National/State/District levels.
3) To understand various functions of health systems by interactions with key stakeholders, policy makers, programme managers, academicians and researchers.
4) To work on the project/task assigned by summer training organization.

During my training period I had an overview of various programmes undertaken in National Rural Health Mission, Goa including the current status of the programmes I also carried out a small study on "Asses the Impact of Long Lasting Insecticidal Nets on Malaria Control among Migrant construction workers- high risk group in Goa."

ABOUT DIRECTORATE OF HEALTH SERVICES GOA

Government of Goa has attained the goal of "**Health For All**" by the year 2000 A.D. through its various health and medical care programmes. Goa is therefore considered as one of the best performing states in the matter of health & medical care.

The state of Goa has an area of 3702 sq.km and a population of 1.35 million. There are 2 districts, 11bliocks and 359 villages. The state has population density of 364 per sq.km. (as against the national average of 312). The decadal growth rate of the state is 15.21% (against 21.54% for the country) and the population of the state is growing at a slower rate than the national rate.

Directorate of Health Services (DHS) has an important role in the provision and administration of health services and in order to raise the quality, extend accountability and deliver the services fairly, effectively and courteously.

Goa has one of the most extensive health systems in India. The Directorate of Health Services has an important role to perform in the Administration as far as health system & services are concerned.

The Directorate of Health Services primarily seeks to provide preventive, promotive, curative and rehabilitative health services to the people through primary health care approach which has been accepted as one of the main instruments of action for development of human resources, accelerating the socio-economic development and attaining improved quality of life. Primary health care is essential health care for all citizens, easily accessible and at a cost which the citizens and community can afford.

In the rural areas services are provided through a network of integrated health and family welfare delivery system. The primary health care infrastructure has been developed as a three tier system - Sub- Centers, Primary Health Centers and Community Health Centers. Sub-Centre is the most peripheral contact point between the Primary Health Care System and the community and is manned generally by Multi-Purpose Health Workers (Male & Female) and a Peon/Attendant. Primary Health Centre is manned by a Medical Officer supported by Para-medical and other staff. Some of the PHCs (13 in number) have attached hospitals ranging with 12 to 30 beds and are headed by a Health Officer.

The PHCs act as referral units for the sub-centers and provide preventive, promotive, curative and family welfare services. The Community Health Centers (5 in number) are headed by a Health Officer generally with four specialist doctors and a minimum of 30 beds. It serves as a referral centre for PHCs. In addition, there are Rural Medical Dispensaries (RMDs 29 in number) in remote and inaccessible areas manned by a R.M.O. and a Pharmacist where regular OPDs are conducted. The Directorate of Health Services with its network of 5 CHCs, 19 PHCs (13 with attached hospitals), 172 Sub-Centers, 29 R.M.Ds, and one Medical Dispensary, provides basic health care services to the people of Goa particularly to those living in rural areas. The two District Hospitals viz. Hospicio Hospital, Margao in South Goa District and Asilo Hospital, Mapusa in North Goa District, and three other specialized/general hospitals viz. Leprosy Hospital, Macazana; T.B. Hospital, Margao; Cottage Hospital, Chicalim; under the Directorate also serve as referral Hospitals. There are in all 1162 beds in the hospitals under the Directorate of which 352 beds are attached to CHCs / PHCs. There are 18 Dental clinics and other special clinics for implementation of various programmes such as Family Welfare, T.B., NCD, STD, Malaria, Leprosy, Control of Blindness, etc. There are two Homeopathic Dispensaries (one attached to UHC, Panaji and the other attached to CHC, Pernem) and 5 Ayurveda Dispensaries (one each attached to District hospitals Mapusa and Margao, PHC Bicholim, CHC Canacona, CHC Curchorem, PHC Balli and PHC Quepem). There are 4 Urban Health Centres in the four major towns viz. Panaji, Margao, Vasco and Mapusa and one Medical Dispensary at Sada, Vasco and a STD Clinic at Baina, Vasco.

NATIONAL RURAL HEALTH MISSION GOA:

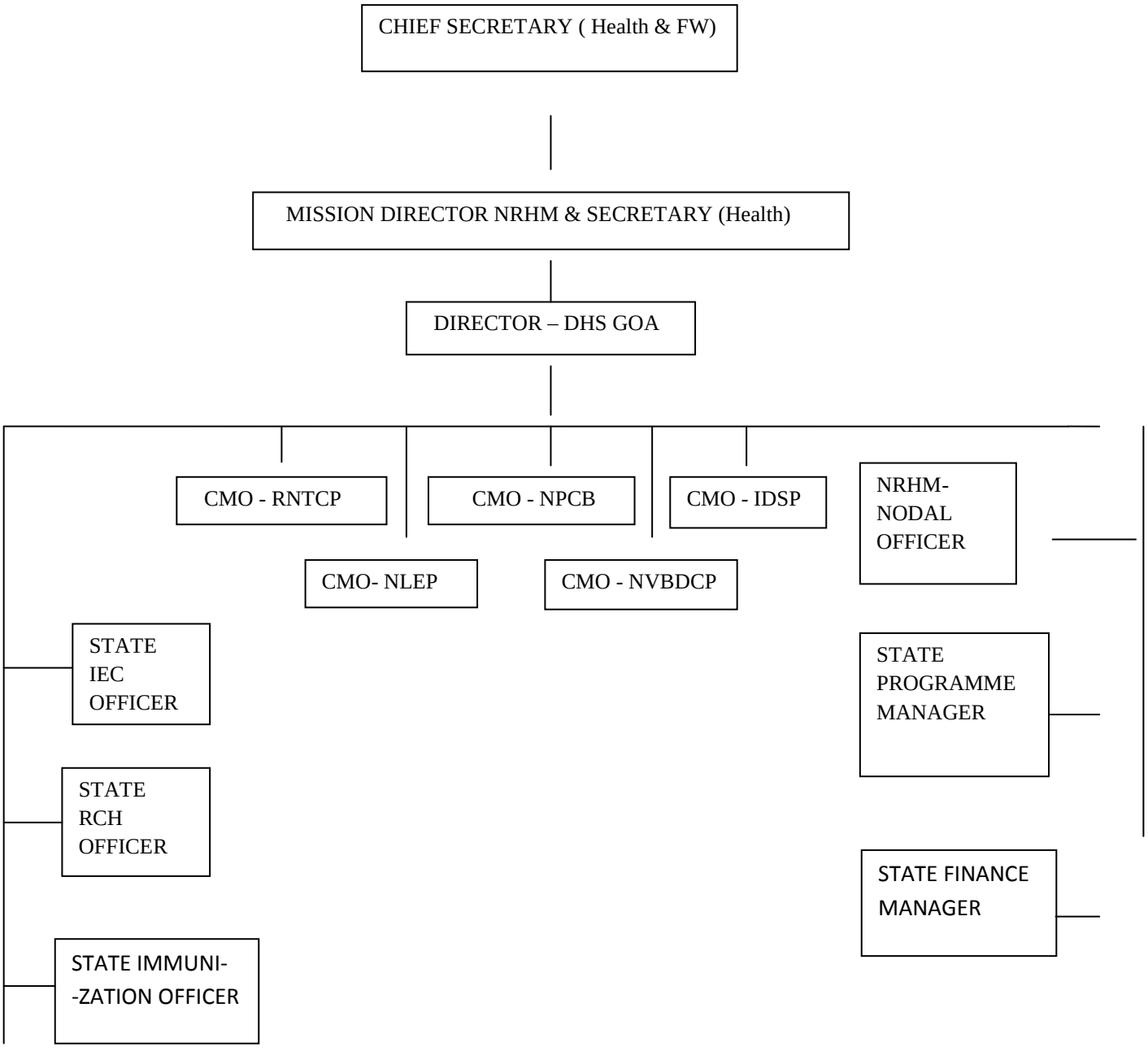
The Government of India launched NRHM on 12th April 2005. The vision of the mission is to undertake architectural correction of the health system and to improve access to rural people, especially poor women and children to equitable, affordable, accountable and effective primary health care throughout the country with special focus on 18 states with weak public health indicators. Goa, one of the states with best health indicators in India and with a strong infrastructure does not come in the 18 EAG states.

Objectives of NRHM:

1. To bring IMR to less than 28
2. To bring MMR to less than 100
3. To achieve TFR of 2.1
4. To strengthen the existing infrastructure.
5. Appointment of contractual staff.
6. Addition of component of AYUSH
7. To increase community participation with the help of Rogi Kalyan Samiti at all hospitals and Village health and sanitation committee.

There are 285 VHS committees in Goa. Every month meeting is conducted at sub-centre level between members of the VHS committee, the sarpanch of respective villages and state program Manager. The concept of ASHA is non-existent in Goa. The network of ANM and Anganwadi workers is strong. In Goa ANM does the house to house visit.

ORGANOGRAM OF NRHM GOA



STATE INITIATIVES

- Mammography vans – Along with the set up of a mobile medical unit, these vans have USG. Three day mammography camps are conducted at one place accompanied by a gynecologist. Screening of Breast Cancer is done during these camps.
- Nutritional officers- They conduct nutrition camps at PHCs and sub-center level.
- Maternal death tracking – Tracking and Auditing of Maternal and Infant deaths. Identifying the reason and ways to correct them.
- The post of school health consultant is also sanctioned.

FUNDING

GOI contributes eighty five percent of total funds while the state government contributes to 15%. As per PIP 2011-2012 the state's share was 3.61 crores while that of central government was 20.46 crores. The balance of previous year was 3.06 crores.

1) **Revised national tuberculosis control programme**

Formerly known as NTCP since its inception in 1962, the program was renamed as RNTCP in 2006.

Goal – To reduce the incidence and prevalence of TB cases to such a level, so that TB is not a public health problem.

Objectives-

- To achieve and maintain 85% or above cure rate among new sputum positive patients.
- To achieve and maintain detection of 70% or more such cases existing in the community.

Goa, with a population of 15.4 lakhs has four TB units, two in north and two in south according to the norm of 1 unit per 5, 00,000. Each TB unit has senior TB treatment supervisor (STTS) and senior TB lab supervisor (STLS). There is on Designated Microscopic centre (DMC) per lakh population. There are 21 DMCs in Goa. Goa has a TB prevalence of 200 cases per lakh per year. The annualized new sputum positive case detection rate as per PIP 2009-2010 was 42%. Now it has increased to about 68% while the smear conversion rate

was 89.8% and treatment success rate was 80.2%. There are 1122 total number of DOT providers in Goa.

2) N.R.H.M additional office (DHS)-Objective is to strengthen the existing health facilities, appointment of the contractual staff, community participation through Rogi kalian samiti, village health sanitation and nutrition committee. State initiatives in Goa were

i) Mobile mammography van-in collaboration with Ngo muskan to screen the females for breast cancer

ii) Nutrition officers-to educate the females regarding adequate nutrition in adolescent health and women in reproductive age group

iii) Maternal death tracking-to track each and every maternal death and find out the reason for the same even by interviewing the family members the latter part of the process know as community based review.

3) Diabetic registry (DHS)-Government of Goa had a MoU with Novanordisk education foundation to initiate Diabetes mellitus control program through mass awareness with focus on reducing complications. It started in 3 phases

Improvements-i) Diabetic mobile clinics-Screening in high risk areas

-Appointed diabetic surveyor

ii) Free diabetic treatment-oral hypoglycemic agents were given by the govt. in 2010.standidng committee was formulated include doctors from GMC,DH, IMA who decide to introduce insulin (flex pens)

iii) Diabetic registry-formed in 24/6/2011

Activities of Novanordisk-live display of food, 11058 patients are registered diabetic registry,3 foot care units, trained MO in diabetology

4) **State health and family welfare (DHS)**-Auxiliary nurse midwives does the house to house survey and collect the information about the eligible couples and pregnancies at S.C level this information is then utilized for family planning and immunization programmes. Immunization done once every month at Sc once every week at PHC and twice a week at DH

State initiatives-New born screening, Introduction Rubella and Vit. A for girls and pre marriage age group in 2008, Pre natal diagnostic test (PNDT) act, Teen clinics, thyroid testing in pregnant women's

Limitations– the referral system at CHC and PHC is poor so patients go to DH. thereby, Increasing the burden of delivery system

5) **Immunization Department (DHS)-** 90% fully immunized in Goa

Problem-migrant children, Vit A subjects lost between 18 months to 5 years

Targets achieved-23,186 children immunized up to measles target was 21005

6) **NPCB (DHS)-**Ophthalmic assistant at GMC and PHC, trained for vision testing and cataract detection, special cataract detection camps all over the state, free spectacles given at all the centers, school health-ophthalmic personnel to screen children, free IOL are used instead of glasses after the cataract surgery.

7) **NIMR(DHS)-**One of the institutes under ICMR.NIMR Goa inception was in 1989 after malaria outbreak, Introduced bio-environmental methods after which malaria cases dropped from 5000 to 413 in 1989 to 1992 respectively does basic research, applied research and operational research in malaria

Changes in health system- ANM's for passive collection of blood slides, LLIN's to migrant construction workers, proteogenesis of parasites, collaboration with VBDCP for monitoring

8) **NLEP (DHS)-**leprosy is in the stage of elimination in Goa with 0.36 cases/10,00 population. Most of the cases are in Migrant workers due to delayed diagnosis. Treatment is being given by SC and PHC and the treatment completion rate is 92%.treatment card are yellow (patient card), blue (PHC treatment record), green card (drug stock record), white card (disability and nerve dysfunction record). Rs 5000 are given to the one undergone reconstruction surgery.

National vector borne disease control program(NVBDCP) Goa

The vision-

1) To provide effective health care to the rural population
2) To implement effective village health plan under the head of village health and sanitation committee
3) To improve public health indicators and weak infrastructure
4) Training of paramedics ASHA and other health care personae; to improve health care delivery system

Goals

1) Reduction in morbidity and mortality of all vector borne disease
2) Prevention and control of vector borne disease by giving area wise specific priorities
3) Universal access to public health services and promotion of healthy life style with the help of integrated vector borne management

NRHM objectives

1) Malaria morbidity and mortality reduction rate by 50 % in 2010 and additional 10% by 2012
2) Elimination of filarial by 2015 70 % by 2010 80 % 2012
3) Elimination of kala-azar by 2010
4) Reduction in J.E mortality rate by 50% by 2010
5) Reduction in dengue by 50 % by 2010

6) Effective control over chikungunya morbidity

Componenets of the Program

1) Malaria control Program
2) Filaria control Program
3) Japenese encephalitis
4) Kala azar
5) Dengue and chikungunya

EXECUTIVE SUMMARY

The project is to assess the impact of long lasting insecticidal nets on malaria control amongst migrant construction workers-a high risk group in Goa.

Malaria imposes great socio-economic burden on humanity, and with six other diseases (diarrhea, HIV/AIDS, tuberculosis, measles, hepatitis B, and pneumonia), accounts for 85% of global infectious disease burden. Goa with an estimated annual parasitic incidence of 2-5 that is more than the national average, has adopted various integrated measures for malaria control. In 2008 recorded the highest incidence (9,822 cases) and highest mortality (21 persons). In the three years thereafter only four deaths have occurred from malaria. However, it is still a matter of great concern that malaria has not been satisfactorily controlled. Long Lasting Insecticidal Nets were thus introduced in 2009 with the mission of curbing the malaria cases in Goa. Since behavioral changes and awareness about malaria helps control malaria A descriptive cross-sectional study was carried out among the migrant construction workers to assess the impact of Long Lasting Insecticidal Nets in high risk areas in Goa.

The study covered both north and south districts of Goa with a sample size of 200 selected from the major construction sites in Goa. Their knowledge and practice was assessed with the help of a semi-structured questionnaire prepared from a combination of standard questionnaires proposed by WHO. Data was analyzed using SPSS.

The findings showed that long lasting insecticidal nets had a huge impact in controlling malaria cases among the migrant workers since its inception. Moreover, the benefits of healthy disease free life were also perceived by the workers using long lasting insecticidal nets.

Introduction

Malaria is caused by a parasite called Plasmodium, which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells. The World Health Organization estimates 300-500 million malaria cases annually. However, Southeast Asia contributed to only 2.5 million cases to the global burden of malaria. Of this, India alone contributed 76% of the total cases. Currently, 80.5% of the 1.2 billion population of India lives in malaria risk areas. Of this, 4.2%, 32.5% and 43.8% live in areas of high, moderate and low risk to malaria respectively.

Unbridled urbanization, drought, migration of workers, and lax control efforts are all contributing to the resurgence of malaria in India and the problem is expected to exacerbate in the years to come. . With increasing global warming, it is projected that in 2050s, malaria is likely to persist in Orissa, West Bengal and southern parts of Assam, bordering north of West Bengal, but may shift from the central Indian region to the south western coastal states of Maharashtra, Karnataka and Kerala. Also the northern states, including Himachal Pradesh and Arunachal Pradesh, Nagaland, Manipur and Mizoram in the northeast may become malaria prone.

Goa has become a high risk area for malaria with API more than 2.Until 1985; malaria was not a serious problem in Goa. First outbreak of malaria occurred in 1986 followed by many till 1990s. The outbreaks were around the building construction sites. There was also increased prevalence of P. falciparum and deaths were also reported during the years 1996 to 2000. The major vector responsible for the transmission of malaria is An. stephensi and was found profusely breeding in the curing tanks at the construction sites. Malaria in Goa was high among the labor population living in the precincts of the construction sites.

Long Lasting insecticidal Nets (LLIN's) were thus introduced in Goa in the year 2009 to control the malaria cases. LLINs are nets that are treated at factory level by a process that binds or incorporates insecticide into the fibers. They are designed to maintain their biological efficacy against vector mosquitoes for at least 3 years under recommended conditions of use in the field, obviating the need for regular insecticide re-treatment. Distribution of LLINs was done systematically accompanied by provision of information on how to hang, use and maintain them properly in Goa at the construction sites .The distribution and provision of LLIN's started in 2009, to assess the impact of Long lasting

insecticidal nets on malaria control this study was undertaken on migrant construction workers at the major construction sites in Goa.

OBJECTIVE(S)-

GENERAL- To assess the effectiveness of llin's on malaria control among migrant workers in high risk areas in Goa.

SPECIFIC – a) To assess the coverage, usage, acceptability and impact of llin's at the major construction sites among migrant construction workers.

b) To assess awareness and behavioral change among the migrant construction workers regarding malaria and its prevention with llin's

RESEARCH QUESTION

1) What percentage of migrant construction workers is using llin's?
2) How effective llin's have proved to be in terms of reducing malaria cases among the migrant workers?
3) Does the use of llin's lead to behavior change of the migrant workers towards malaria and its prevention?

METHODOLOGY

The following tools were used for carrying out the study; some of the tools were purely used for exploratory research.

1) Secondary Data: Documents offered by the National vector borne disease control program department and National institute of malaria (Goa) research department were studied in great depth for a better understanding of the project

2) Primary Data: Primary Research has been the most crucial tool used in the form of interviews with migrant construction workers at construction sites in five high risk areas (Panjim, Margao, Corlim, Aldona, Candolim) in Goa

3) Questionnaire: Interview guides and questionnaires formed the backbone of most primary surveys and interviews.
Refer to Appendix 1

STUDY DESIGN

Type of study- Descriptive cross sectional study study

Study area- Goa

Study group- Major construction site in high risk areas in Goa

Study unit - Migrant construction workers

Sampling-10 major construction sites were selected from five high risk areas for malaria in Goa. As the majority of construction workers are migrant, 20 workers were randomly selected by convenience sampling and interviewed from each construction site forming the sample size of 202 migrant construction workers(+2 workers; the family members of the workers who were available at the time of the interview)

High risk areas-Panjim, Candolim, Corlim, Aldona, Margao

Major construction sites-

Panjim-ocean Park, Gera's Astoria
Candolim-maruti rich ventures, Devasri's constructions
Corlim- Aldiea de Goa, Hindustan constructions
Aldona-The highland, acron constructions
Margao-district hospital, Collectrate building

Data collection tool- Questionnaires

Data collection technique- Personal interview

Data analysis software- SPSS 16

FINDING AND ANALYSIS-

PERCENTAGE OF WORKERS USING NETS (PLAIN+LLIN's)

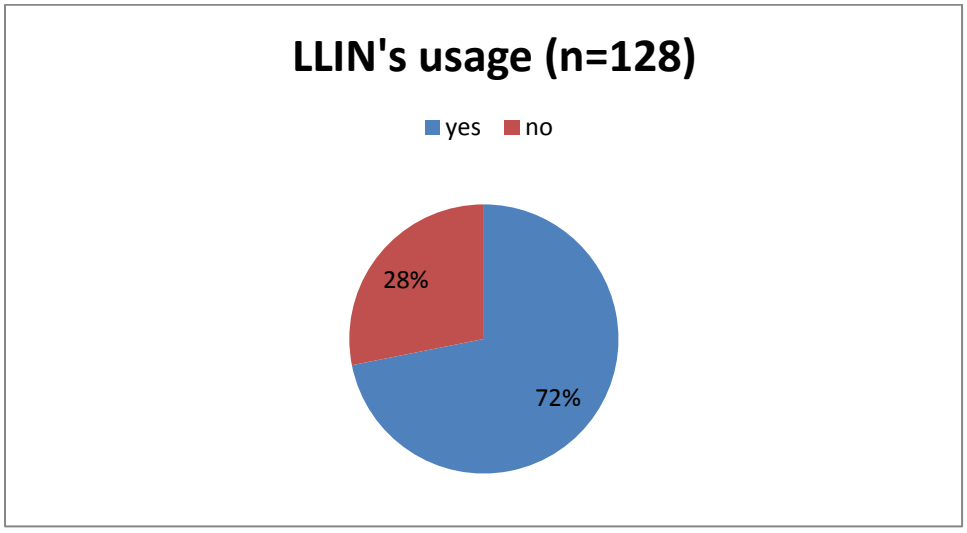
WHICH METHOD DO YOU USE TO PREVENT MOSQUITO BITE-MOSQUITO NET

Table 1

Response	Number of respondents	Percentage valve
Yes	128	63.4
No	74	36.6
total	202	100

It was observed that 128 out of 202 workers interviewed were using nets both plain and LLIN's. The rest 74 people were using methods like mosquito repellent coils, mosquito repellent creams, mosquito repellent liquid and fan

LLIN's USAGE



72 % of 128 people using nets were using llin's the rest were using plain nets.

LLIN's PROVISION

HOW DID YOU ACQUIRE LLIN-PURCHASED FROM THE GOVT.

Table 2

Response	**Number of respondents**	**Percentage**
Yes	4	4
No	88	96
Total (LLIN's in use)	92	100

It was observed that 4 of 92 workers using llin purchased it from the government

GIVEN FREE BY THE BUILDER

Table 3

Response	**Number of respondents**	**Percentage**
Yes	76	83
No	16	17
Total	92	100

It was observed that 76 of the 92workers using llin were given the net free by the company they were working for

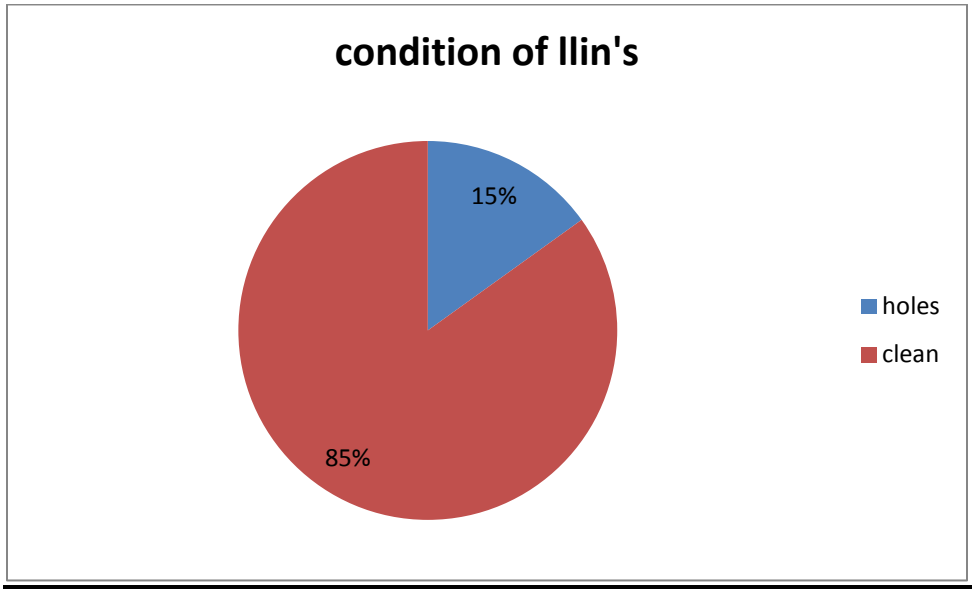
OTHERS SPECIFY

Table 4

Response	Number of respondents	Percentage
From the shop	3	19
Purchase from the contractor at 50rs	8	50
Purchase from the contractors at 150rs	5	31
Total	16	100

5 of the 92 workers using llin's purchased the net from their contractors for 150 Rs, 8 of the workers purchased it from the contractors for 50 Rs and 3 workers purchased net from the shop

CONDITION OF THE NETS



the total of 101 nets were observed out of which 15% nets had holes and were dirty (stained with blood and mud) and the rest 85% were clean

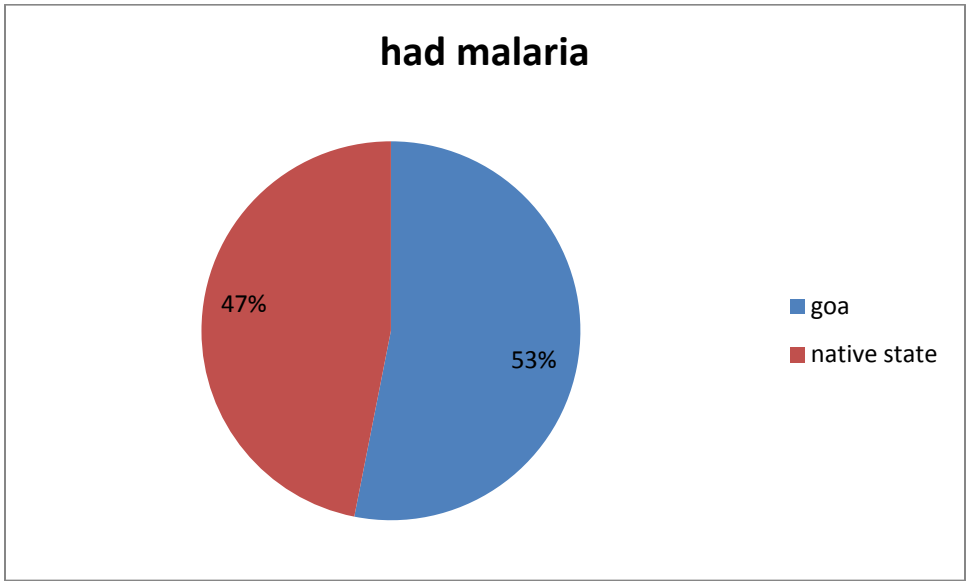
HISTORY OF MALARIA FEVER IN PAST ONE YEAR

Table 5

	Malaria cases	Percentage
Respondents	27	73
Family members	10	27
total	37	100

27 workers out of 202 workers interviewed and 10 of their family members had history of malaria fever.

HAD MALARIA IN



53 % of 32 workers and their family members who had malaria were in Goa when they had an episode of malaria fever and the rest 47% had malaria when they were in their native.

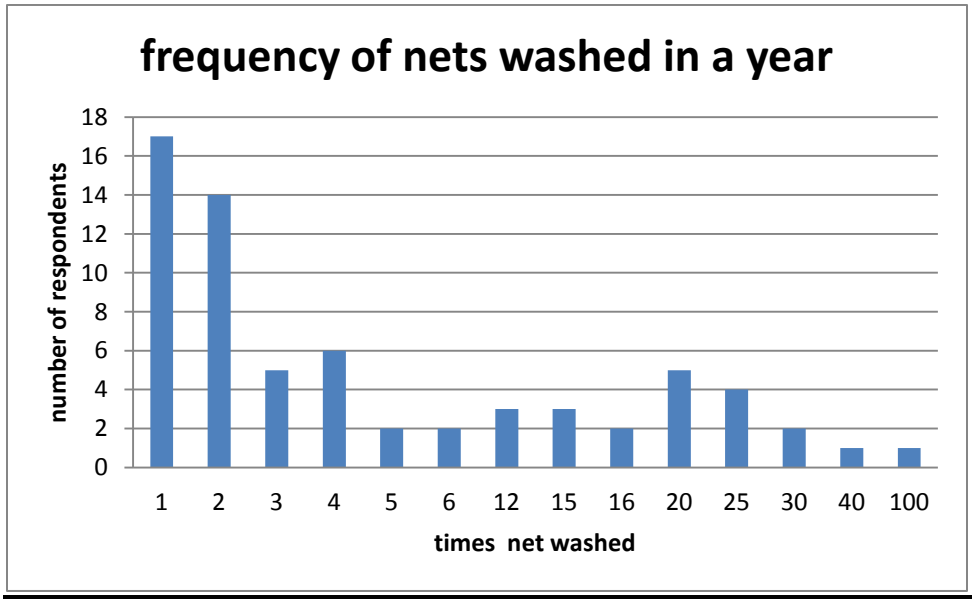
MALARIA CASES IN HOUSEHOLD AFTER LLIN USAGE

Table 6

Response	Number of respondents	Percentage
Yes	5	5
No	87	95
Total	92	100

It was seen that only 5of the workers using llin had malaria cases after using llin's the rest 94% workers did not have any malaria episode after using llin's

WASHING PRACTISE

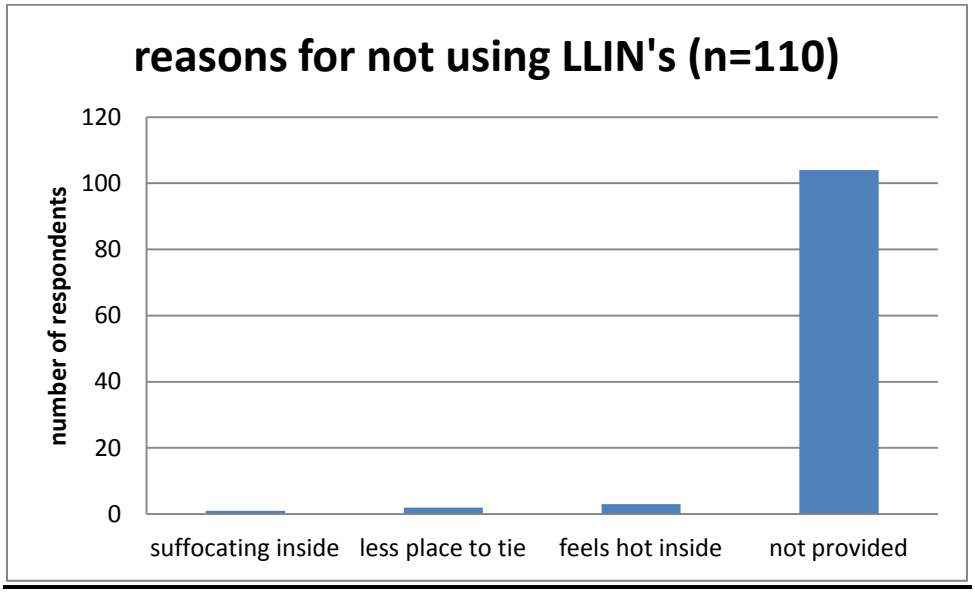


Approximately More than 60 % of the respondents using LLIN's washed the nets for more than 3 times in a year hampering the effectiveness of the nets

INSTRUCTIONS GIVEN ABOUT THE NETS BY HEALTH WORKER AND SITE MANAGER WERE-

1) Wash it and hang it in sun
2) Hang it and sleep in net
3) Use it daily
4) Wash every week, every 15 days
5) Keep it clean
6) Do not smoke inside the net

REASON FOR NOT USING LLIN



110 out of 202 workers interviewed were not using llin's
And 95 % of these 110 workers were not provided with llin's

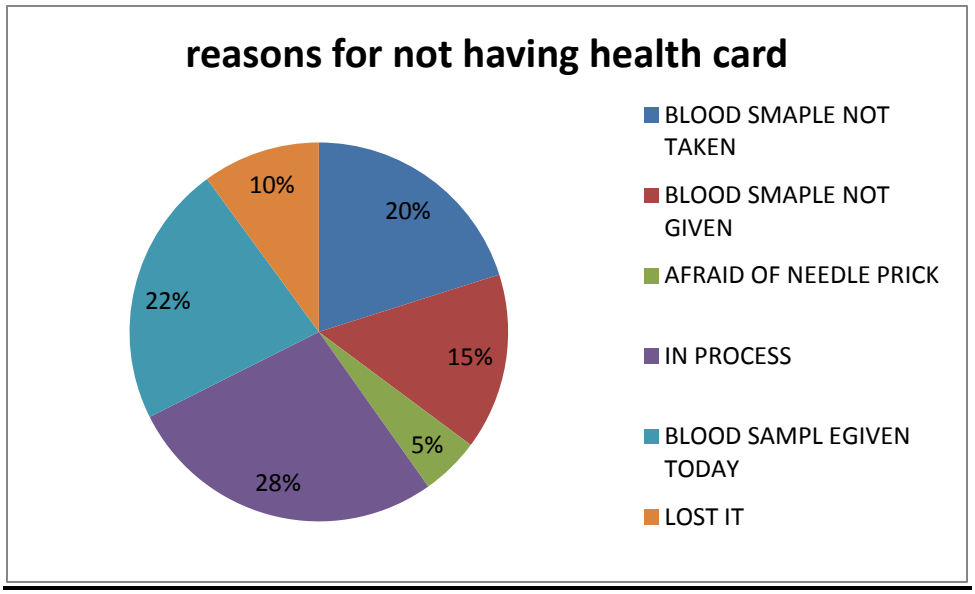
RESPONDENTS HAVING HEALTH CARD

Table 7

Response	Number of respondents	Percentage
Yes	113	56
No	89	44
Total	202	100

It was seen that 56.2 % of 202 workers interviewed were having health cards and the rest 43.8% workers did not have health cards

REASON FOR NOT HAVING A HEALTH CARD



89 workers out of 202 workers interviewed did not have health card most of the health cards were in process (28 %) followed by blood sample given today (22%) and blood sample not taken (20%)

HEALTH CARD RENEWED

Table 8

Response	Number of respondents	Percentage
Yes	72	36
No	130	64
Total	202	100

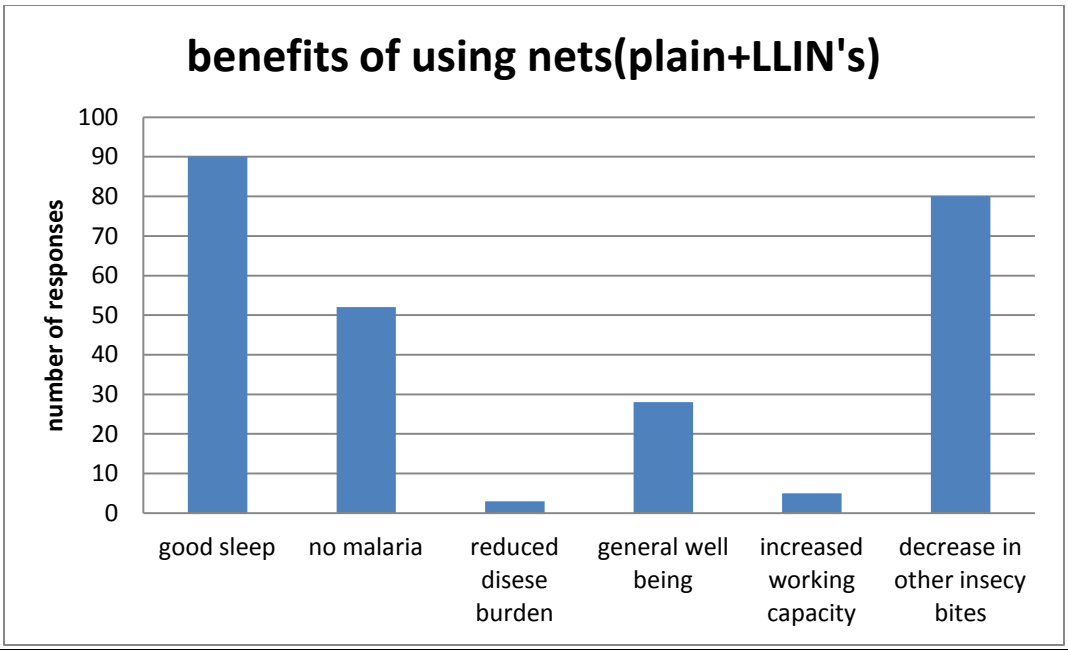
out 113 workers having health card 72 health cards were renewed

User's perception on LLIN's (N=92)

Table 9

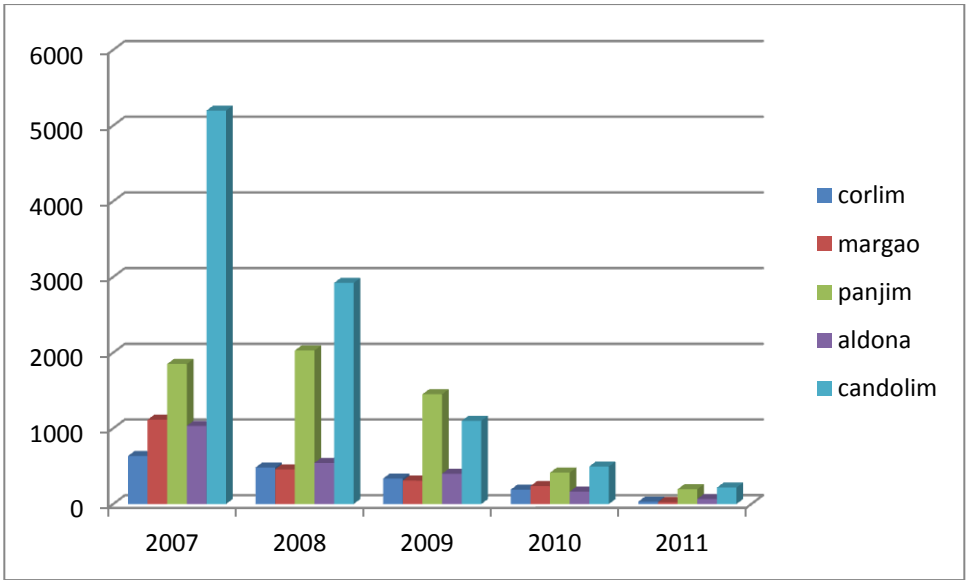
Indicators	Very poor (%)	Poor (%)	Satisfactory (%)	Good (%)	Very good (%)	Excellent (%)	Total (%)
Affordability	1.1`	1.1	5.4	37.0	51.1	4.3	100
Accessibility	-	-	-	45.7	51.1	3.3	100
Availability	-	-	1.1	73.9	21.7	3.3	100
Easy to use	-	-	2.2	44.6	53.3	-	100
Usefulness	-	-	1.1	9.8	70.7	18.5	100

BENEFITS OF USING LLIN's



Impact of LLIN's on malaria in Goa-

Malaria trend in high risk areas in Goa (2007-2011)



The malaria trend in Goa over the period of five years (2007-2011) shows that there has been commendable reduction in malaria cases from 2007 to 2011 with marked reduction in cases from the year 2009(LLIN's introduced)

RECOMMENDATIONS

1) ***Problem area -***the percentage of workers not using llin's is more than the percentage of workers using llin's so, aware regarding llin's is on the lower side. Even the information as to how to use the nets is very little

Recommendations-some IEC activity can be conducted to increase the awareness regarding the llin's amongst the workers. The most favorable route can be display via hoardings, media/television, dramatic picturization of sign and symptoms of malaria and the sufferings thereafter and weekly health worker- workers meeting. In these meeting the health worker can educate the migrant workers about the correct and proper usage of the nets to retain the effectiveness and efficacy of the nets

2) ***Problem area-***more than 40% of the workers did not have health card and approximately 50 % of those 40% workers had the reasons like blood sample and photo graph not taken, blood sample not given as was afraid of the needle prick, lost the health card, was unaware of the blood sample being taken etc.

Recommendations-a)contractors can be of great help here as these workers work under a specific contractor and on an average not more than 15 workers work under one contractor, they can easily keep a tab on the blood sample being collected, photographs being given and health card being issued and can inform the health worker in case of new joining.

b) Bell system can be introduced to manage the blood screening activity of the workers. A bell can be put up at the construction sites which is to be rung only by the health worker on his/her visit for blood collection thereby, informing all the workers about his/her visit.

3) ***Problem area-***at some construction sites the condition of the nets and the sanitation and hygiene of the workers were very poor (Gera's Astoria-Panjim, Collectrate-Margao)

Recommendations- to keep a tab on the cleanliness and hygiene of the surroundings of these workers and regular check on the condition of the nets done by the health workers.

CONCLUSIONS-

1) Regular chemical spraying and fogging activity is being carried out by the health workers at the construction sites

2) Bio-larvicidal (introduction of Gambusa fish at stagnant water collections e.g.- curing tanks) method to control the larval growth is being done regularly by the health workers at the construction sites.

3) Collection of blood sample for screening and issuing health cards is being done regularly at most of the construction sites maximum number of workers left out of the screening activity were either unaware of the health workers visit or were afraid of needle prick.

4) Cleanliness and hygiene in the vicinity of the workers accommodation was poor there was waste stuff like plastic tubs, tiers , coconut shells, and water stagnated at many places, potent sites for mosquito breeding.

5) As most of the workers were from southern part of India, language barrier is a big problem most of the instructions given by the health worker were not understood by the construction workers.

6) Overall the blood screening activity, issuing of health cards and anti- larval measures carried out by the health workers were regular however, coverage of llin's was found to be on a lower side probably due to floating nature of the target population.

APPENDIX- 1

INFORMED CONSENT (FOR RESEARCH PURPOSE ONLY)

We are carrying out a project "To assess the impact of long lasting insecticidal nets on malaria control among migrant construction workers in high risk areas in Goa" during our internship at Directorate of Health Services, Goa. All information obtained from you will be kept confidential and used solely for planning and program implementation. Your participation in the interview is voluntary and you can withdraw at any point of time you want .If yes, then proceed further.

Certificate of consent

I have read the above information/it has been read out to me. I have had the opportunity to ask questions about it and any questions that I have been answered to my satisfaction. I have understood the information given to me. I consent voluntarily to participate myself/son/daughter/ward as a participant in this survey. I understand that, I have the right to withdraw myself/son/daughter/ward from the survey at any time without in any way affecting medical care of my family.

SIGNATURE OF RESPONDENT-

DATE-

QUESTIONNAIRE TO ASSES EFFECTIVENESS OF LLIN's ON MALARIA CONTROL

1) Socio-Demographic profile

Age- sex- p.h.c-

Male-1 construction site-

Female-2

Address-

Literacy- Iliterate-1

Informal literate-2

Formal literate-3

2) Migrant/local

Native state (if migrant)-

Last visit to the native state (if migrant)-

Duration of stay in Goa-

3) members in the family

Male- 1 female- 2

Female: (pregnant)- 3

Children: 4

Awareness about malaria

4) Have you heard of malaria?

Yes- 1 no-2

5) Is malaria a problem in your present place of residence/work?

Yes- 1 no-2

6) Whether malaria problem exist in your native place?

Yes-1 no-2

7) Are you aware of sign and symptoms of malaria?

Yes- 1 no-2

(If yes)

A) Which signs and symptoms are you aware of?

1 fever with chills
2 headache
3 abdominal pain
4 general weakness
5 others specify

b) Received the information from whom

1 health workers-
2 media/television-
3 peers-
4 self-
5 others specify-

8) In your opinion how malaria spreads?

1 mosquito bite
2 house fly
3 drinking contaminated water
4 coughing
5 poor hygiene
6 don't know
7 others specify

9) Do you have history of malaria fever in past one year (if no go to q.no 11)

Respondent-1

Family member-2

10) <u>q.no 9 if yes</u>

A) did you go to the **health centre** to give the blood sample (passive)

Yes- 1 no-2

i) if no, reason

No money-1
Loss of time-2
Loss of wages-3
Transportation charges-4
Poor acessability-5
Others specify-6

ii) did you go to collect the reports

Yes- 1 no-2

If no, why

No money-1
Loss of time-2
Loss of wages-3
Transportation charges-4
Poor acessability-5
Others specify-6_____

iii) Was the treatment prescribed to you after diagnosis?

Yes- 1 no-2

iv) did you take the complete treatment

Yes- 1 no-2

If no, why

(Show the used wrapper if you have taken full treatment/ study personnel to confirm whether she/he consumed full dose if it is a recent case.)

B) Did the **health worker** come to collect the blood sample (active)

Yes- 1 no-2

i) Was treatment given to you after the diagnosis? yes-1 no-2

ii) After how many days did you receive the treatment form the malaria worker? _____

iii) Did you take the complete treatment? yes-1 no-2

If no, reason

(Show the used wrapper if you have/confirm whether he consumed full dose if he is a recent case)

Awareness about malaria prevention

11)Where does the malaria causing mosquito breed?

1 clean water

2 dirty water

3 any water collection

4 vegetation

5 don't know

6 others specify

12) What do you do to prevent mosquito breeding?

1 draining of stagnant water

2 chemical spraying

3 don't know

4 others specify

13) <u>Which method do you use to prevent mosquito bite?</u>

1 mosquito net
2 mosquito repellent creams
3 mosquito repellent coils
4 insecticidal spray
5 none
6 others specify

14)<u>Are you aware of long lasting insecticide treated nets (LLIN's)?</u>

Yes-1 n0-2

15)<u>How do you know about these nets?</u>

Health workers-1
Media/television-2
Peers-3
Self-4
n.g.o person-5
Others specify-6

***16)<u>Do you use</u>* <u>LLIN? (if no go to q.no 28</u>**)

Yes- 1 no-2

17)<u>How did you acquire LLIN?</u>

1- Purchased from govt.
2-purchased from another worker
3-gifted by other worker leaving your site
4-given free by builder/contractor
5-any other specify

18) Who sleeps under the mosquito nets?

Child/children- 1
Mother-2
Mother and child-3
Man-4
Man and child-5
All-6
None-7

19) When did your household obtain the mosquito net?

duration in months- ☐

20) How many nets do you have? ☐

21) Ask the respondent to show the nets in the household

net 1	***net 2***	***net 3***
Observed-	observed-	observed-
Not observed-	not observed-	not observed-

22) Inspect the net for holes, wear and tear, etc.
with holes - 1/ without holes-2/ dirty-3/clean-4

23) How many times you have washed the net/nets since received?

24) How frequently you wash the net?

25) When did you wash the net/nets last?

26) How do you use these nets?

1-hang it

2-use as a pillow
3-use as a quilt
4-others specify

27)<u>Were there any malaria cases in your household after LLIN's usage?</u>

Yes- 1 no-2

If yes, how many?

A) did you go to the **health centre** to give the blood sample (passive)

Yes-1 no-2

i) if no, reason

No money-1
Loss of time-2
Loss of wages-3
Transportation charges-4
Poor acessability-5
Others specify-6

ii) did you go to collect the reports

Yes- 1 no-2

If no, why

No money-1
Loss of time-2
Loss of wages-3
Transportation charges-4
Poor acessability-5
Others specify-6

iii) Was the treatment prescribed to you after diagnosis?

Yes-1 no-2

iv) did you take the complete treatment

Yes-1 no-2

if no, why

(Show the used wrapper if you have taken full treatment/ study personnel to confirm whether she/he consumed full dose if it is a recent case.)

B) did the **health worker** come to collect the blood sample (active)

Yes-1 no-2

i) Was treatment given to you after the diagnosis? yes-1 no-2

ii) After how many days did you receive the treatment from the malaria worker?

iii) Did you take the complete treatment? yes-1 no-2

If no, reason

(Show the used wrapper if you have/confirm whether he consumed full dose if he is a recent case.)

28) <u>Where were you when you had the episode of malaria fever?</u>

1-goa

2-native state( )

29)<u>Do you know how to use these nets?</u>

Yes- 1 no-2

(If yes) a) who gave you the instructions-health workers-1

Site managers-2

Peers-3

Self- 4

b) What were the instructions?

1.

2.

3.

4.

c) Do you follow the instructions-?

i) use it daily- yes- 1 no- 2

ii) carry the net along with you were ever you go-yes-1 no- 2

iii) use the net when you sleep even during day time-yes-1 no-2

iv) others specify-

30)Reasons for not using LLIN's?

1 suffocating inside

2 less place to tie

3 feel hot inside

4 cannot share

5 not provided

6 others specify

31) Do you have a health card?(Ask the respondent to show the health card)

Yes-1 since when (duration in months) -

No-2

if no, why not-

32)Is your health card renewed (if more then three months)?

Yes-1 no-2

If no, why not?

Time factor-1

Accessibility-2

Duration of renewal too short-3

Others specify-4

33)How would you rate LLIN's

	excellent	***very good***	***good***	***satisfactory***	***poor***	***very poor***

a) affordability-						
b)easy to use						
c) accessibility						
d) availability						
e)usefulness						
f) others specify						

34) <u>If you find the net useful will you use it in future?</u>

Yes- 1 no-2

35)<u>How has the net helped you in your day to day activities?</u>

1 good sleep
2 no malaria
3 reduced cost of disease burden
4 general well being
5 increased working capacity
6 decrease in other animals/insect bite
7 others specify

36)<u>Will you recommend these nets to yours peers and relatives?</u>

Yes-1 no-2

NAME OF THE SURVEYOR:

SIGNATURE AND DATE:

Environmental conditions and condition usage of LLIN's at the construction site visited in Goa
Maruti Rich Ventures-Candolim

Gera's Astoria-Panjim

Aldea-de-Goa- Corlim

District hospital-margao

Blood screening activity of the workers at syngenta pesticidal company at Corlim-Goa


GREAT WALL