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ICMR-NATIONAL INSTITUTE OF EPIDEMIOLOGY

(INDIAN COUNCIL OF MEDICAL RESEARCH)

ANNUAL REPORT 2015-2016

WHO COLLABORATING CENTRE FOR LEPROSY RESEARCH AND EPIDEMIOLOGY

ICMR - NATIONAL INSTITUTE OF EPIDEMIOLOGY
(Indian Council of Medical Research)
Chennai – 600077

Annual Report
2015-16

WHO COLLABORATING CENTRE FOR LEPROSY RESEARCH AND EPIDEMIOLOGY

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1.1 National Hospital Based Rotavirus Surveillance Network

Principal Investigator (NIE)	Sanjay Mehendale, Director and National Coordinator
Co-Investigators (NIE)	C. P. Girish Kumar, Scientist D S. Venkatasubramanian, Technical Officer A
Collaborating Institute/s	Coordinating center- NIE; Referral centers- NIV, CMC, NICED, Jamia Hamdard; Regional centers- NIE Chennai, RMRCs at Port Blair, Dibrugarh, Belagavi, Bhubaneswar, RMIMS Patna& NIRTH Jabalpur; Peripheral centers- ~28 hospital sites across the country
Funding Agency	ICMR [Extramural]
Start date	Phase I–2012; Phase II–2013; Phase III–2014
Study Period	4 years

Background:

In India, an estimated 100,000 children die each year because of rotavirus gastroenteritis. A multi-centric surveillance system was established by ICMR in 2005 in partnership with CDC Atlanta. To build on the success of this network, the surveillance activities were extended to generate more geographically representative data on rotavirus disease burden in India.

Objectives:

1. To establish a national hospital based surveillance to examine long-term trends and pattern of diarrhea attributable to rotavirus among children <5 yr of age seen at in-patient facilities.
2. To determine the age, seasonal distribution and outcomes of rotavirus-associated disease among the population under surveillance, including monitoring trends over time.
3. To investigate the molecular epidemiology of rotavirus in India by typing the G and P type and characterization of un-typeable strains by sequencing.

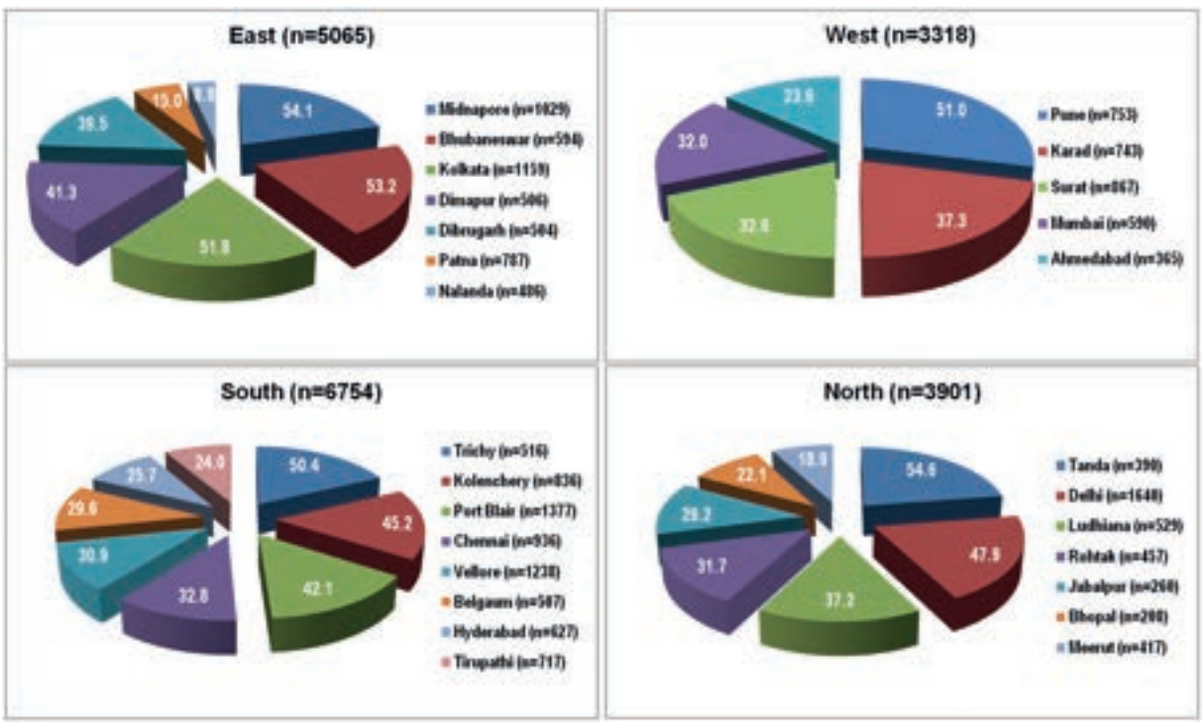
Methods:

All children less than 5 years of age admitted with acute diarrhoea were enrolled after obtaining informed and written consent from parent/ guardian. Clinical information and a stool specimen were obtained. Stool samples were tested for presence of rotavirus by enzyme-linked immunosorbent assay (ELISA). One-third of the rotavirus positive specimens were further characterized to determine the G and P types using Polymerase chain reaction (PCR) based assays. Lab QA/QC exercises was coordinated by CMC, Vellore. Data entry and validation was done using the online data entry module developed and hosted at the NIE website. Data management for the project was done by NIE.

Current status:

The phase I of the surveillance was launched on 19th September 2012 in 8 Clinical Recruitment Sites (CRS) under CMC Vellore and one CRS under RMRC Port Blair. The phase II of the surveillance was launched in September 2013 in 4 CRS under NIV Pune, 4 CRS under JamiaHamdard, Delhi,2 CRS under NICED Kolkata, 2 CRS under RMRC Dibrugarh and 2 CRS under RMRC Belgaum. The phase III of the surveillance was launched in July 2014 in one CRS in RMRC Bhubaneswar, 2 CRS in RMRIMS Patna, one CRS in NIE Chennai and one CRS in NIRTH Jabalpur and Bhopal initiated in August 2014.

A total of 22,549 children were enrolled and 19,038 stools were tested during September 2012 and March 2016. Out of 19,038 children whose stool specimens were tested, 37.8% were found to positive for rotavirus. The region wise rotavirus positivity rates are shown in Figure-1. The distribution of major rotavirus genotypes viz. G1P[8], G2P[4], G9P[4], G12P[6],G9P[8], G12P[6],G12P[8] are shown in Figure-2.



Note: Figure in parenthesis denotes total number of samples tested for rotavirus

Figure-1: RV positivity across regions and sites

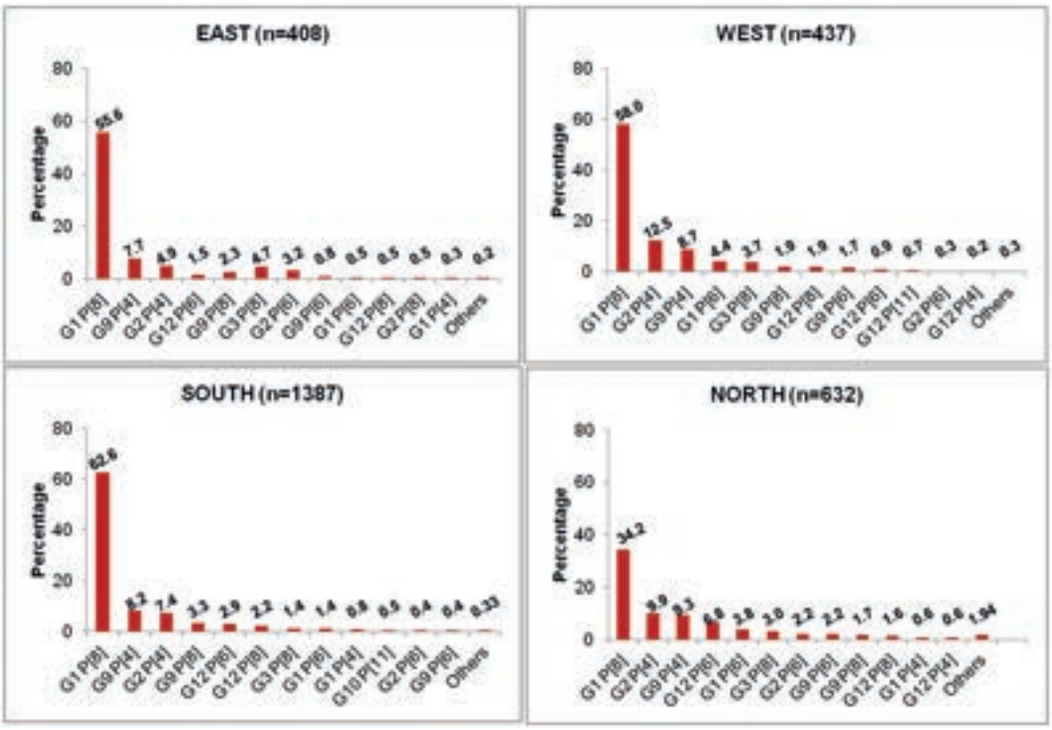


Figure-2: Regional distribution of rotavirus genotypes

Conclusions:

Data from the ongoing surveillance showed that hospitalization due to rotavirus associated acute gastroenteritis among children aged under 5 years occurs throughout the year in India. High burden of severe rotavirus associated gastroenteritis was seen among young children. These findings underscore the importance of rotavirus vaccination in infants and young children to reduce the incidence of severe rotavirus associated gastroenteritis.

1.2 Hospital based sentinel surveillance for Bacterial Meningitis

Principal Investigator (NIE)	Dr. Sanjay Mehendale, Director
Co-Investigators (NIE)	Dr. Yuvaraj, Scientist F Mrs. R. Jayasri, Technical Officer-B
Collaborating Institute/s	(1) Medical College, Thiruvananthapuram, (2) Medical College, Alapuzha, (3) Institute of Child Health, Chennai, (4) Stanley Medical College, Chennai, (5) Kilpauk Medical College, Chennai, (6) Madurai Medical College, Madurai, (7) Christian Medical College, Vellore, (8) Kasturba Medical College, Manipal, (9) Regional Medical Research Centre (ICMR), Bhubaneshwar, (10) Chacha Nehru Bal Chikistalaya, New Delhi, (11) Indira Gandhi Medical College, Shimla.
Funding Agency	Ministry of Health and Family Welfare, Govt. of India
Start date	March 2012
Study Period	3 years and No cost extension given for 1 year.

Background:

The aim of the project was to establish a network for sentinel surveillance for bacterial meningitis caused by H. influenzae, S. pneumoniae and N. meningitidis following the introduction of a Pentavalent vaccine (DPT-Hep.B-Hib) in the country as part of Universal Immunization Programme. An ongoing surveillance network is critical to monitor the changing trends in disease pattern following introduction of the vaccine. The study to know the trend in resistance pattern across the country is also being planned as a part of the project.

Objectives:

Primary Objectives:

1. To establish hospital based sentinel surveillance for bacterial meningitis in children between 1 month and 59 months in six states in India

2. To determine trends of bacterial meningitis in children 1 month to 59 months of age in these states.

Secondary Objectives:

1. Determine the aetiological profile and invasive bacterial disease in children for Hemophilus influenzae type b, Streptococcus pneumoniae, Neisseria meningitidis.

Methods:

The project was envisioned to build capacity in performing sentinel surveillance of bacterial meningitis in hospitals in 6 states in India to understand the baseline disease burden and trends of disease in the country.

Various activities in the project include:

1) Human resources and training

2) Minimal infrastructure support and Essential equipments and supplies to perform regular surveillance

3) Establishment of EQAS and Quality control procedures through a reference lab and coordination mechanism

4) Support for transportation of specimens and communication within network.

National Institute of Epidemiology, ICMR, Chennai was the coordinating center and

Christian Medical College, Vellore was the reference laboratory for the project which provided hospital based data on bacterial meningitis specifically those caused by S. pneumoniae, H. influenzae and N. meningitidis. Data on drug resistance using MIC analysis was generated from all the surveillance sites.

Use of uniform data forms enabled standardized reporting to Ministry of Health and Family Welfare (MOHFW) through ICMR on a regular basis to understand trends of disease in India

The sites selected to form this surveillance network had the technical expertise to carry out Core Surveillance for Bacterial Meningitis. 'Core Surveillance' indicates the capacity to identify all suspect cases of meningitis and provide laboratory support to perform a minimum of diagnostic tests for case confirmation including lumbar puncture and blood culture.

The study population was children above one year and below 59 months with suspected clinical conditions under consideration in this study and admitted to the hospital where the surveillance activity was being undertaken. Children who did not satisfy the inclusion criteria were excluded. All the identified sites had undertaken the surveillance activities with capacity to identify suspect cases of bacterial meningitis (Fever, altered sensorium and seizure) in children between one month and 59 months of age. The sentinel surveillance sites had performed minimum number of diagnostics tests for case confirmation including blood, CSF and other body fluids for serology, Culture and PCR as applicable for the isolation and identification of H. influenza type b, S. pneumoniae and N. meningitidis.

Results:

The surveillance was initiated in 11 sites covering 6 states. These included (1) Medical College, Trivandrum; (2) Medical College, Alapuzha; (3) Institute of Child Health, Chennai; (4) Stanley Medical College, Chennai; (5) Kilpauk Medical College, Chennai; (6) Madurai Medical College, Madurai; (7) Christian Medical College, Vellore; (8) Kasturba Medical College, Manipal; (9) Regional Medical Research Centre (ICMR), Bhubaneshwar; (10) Chacha Nehru Bal Chikistalaya, New Delhi; (11) Indira Gandhi Medical College, Shimla.

Table 1: Summary Results From 1st March 2012 to 28th February 2015

S.No	Indicators	Number
1.	Total no. of in-patients in 11 sentinel sites	3, 006, 248
2.	Total No. of admitted cases as in patients for fever	71, 223
3.	No. of cases suspected for bacterial meningitis by the sites	10, 809
4.	Number of cases excluded	129
5.	Total number of eligible cases for analysis	10202
6.	Suspected cases meningitis cases in whom lumbar puncture was done	9021
7.	Number of Probable bacterial Meningitis cases	1046
8.	Number of Confirmed bacterial meningitis cases	522

During the three year study period between 1st March 2012 and 28th February 2015, 3,006, 248 cases were admitted to inpatient wards of 11 sentinel sites. Among them, 71,223 patients were enrolled for fever with 10,809 cases suspected for bacterial meningitis and 10,202 cases were found to be eligible for enrollment (Table 1). Lumbar puncture was done in 9021 cases, of whom 1046 cases were categorized as probable meningitis cases and 522 were confirmed as bacterial meningitis cases either by latex agglutination test or CSF culture or blood culture or PCR (Table 1).

Table 2: Species wise positivity for bacterial meningitis among 1 to 59 months children

S. No	Species	No. of confirmed cases	Percentage of Positivity	
			Among suspected cases (N= 10202)	Among confirmed cases (N= 522)
1.	*H. influenzae type b*	113	1.1%	21.7%
2.	*S. pneumoniae*	390	3.8%	74.7%
3.	*N.meningitidis*	19	0.2%	3.6%

Out of 10,202 suspected cases, 113 (1.1%), 390 (3.8%) and 19 (0.2%) were positive for H. influenzae type b, S. pneumoniae and N. meningitidis respectively. Among the total confirmed positive cases, positivity for H. influenzae type b was 21.65%, S. pneumonia was 74.71% and 3.64% for N. meningitidis (Table 2).

Table 3: Percentage of positives among the total eligible by each test procedure

Test procedure	Total number processed	*H. influenzae-type b*		*S. pneumoniae*		*N. meningitidis*	
Positive by		No.	%	No.	%	No.	%
Latex alone	9021	66	0.7	74	0.8	15	0.2
CSF Culture alone	9021	0	0	2	0.02	0	0
Blood culture	8233	8	0.1	53	0.6	0	0
PCR alone	6540	7	0.1	207	3.2	0	0
More than one test	10202	32	0.3	54	0.5	4	0.04
Either of the above four (Latex, CSF culture/Blood/PCR	10202	113	1.1	390	3.8	19	0.2

Note: Testing ongoing for 4th year data.

Table 4: Distribution of Bacterial Meningitis confirmed cases in 11 sentinel sites by species

Centre	Total Confirmed Positives by either Culture or Latex or PCR (N= 522)			
	H. influenzae- type b	*S. pneumoniae*	*N. meningitidis*	Total
GMC, Trivandrum	14 (40%)	19 (54.3%)	2 (5.7%)	35 (6.7%)
TDMC, Allepey	3 (12%)	20 (80%)	2 (8%)	25 (4.8%)
ICH, Chennai	7 (8.23%)	76 (89.4%)	2 (2.4%)	85 (16.3%)
SMC, Chennai	5 (20%)	19 (76%)	1 (4%)	25 (4.8%)
KMC, Chennai	1 (4%)	22 (88%)	2 (8%)	25 (4.8%)
MMC, Madurai	7 (10.1%)	56 (81%)	6 (8.7%)	69 (13.2%)
CMC, Vellore	7 (11.5%)	54 (88.5%)	0 (0%)	61 (11.7%)
KMC, Manipal	5 (15.2%)	27 (81.8%)	1 (3.0%)	33 (6.3%)
RMRC, Bhubaneswar	20 (43.5%)	26 (56.5%)	0 (0%)	46 (8.8%)
CNBC, New Delhi	37 (51.4%)	35 (48.6%)	0 (0%)	72 (13.8%)
IGMC, Shimla	7 (15.2%)	36 (78.3%)	3 (6.5%)	46 (8.8%)
TOTAL	113 (21.7%)	390 (74.7%)	19 (3.6%)	522

In all 11 sentinel sites, S. pneumoniae was the prevalent species identified with the exception of CNBC New Delhi, in which H. influenza type b (51.39%) was the commonest species as confirmed either by culture or latex agglutination test or by PCR (Table 4).

Current status:

As per the expert committee recommendation, the project has been terminated on July 1st 2014 at Kilpauk and Stanley Medical Colleges, Chennai. Bacterial meningitis surveillance activity has been closed down in 5 more sites, which include MMC Madurai, TDMC Alapuzha, RMRC Bhubaneswar, KMC Manipal and CMC Vellore in September 30th 2015 due to administrative reasons. Presently the remaining 4 sites are functioning. MOHFW has given permission for no-cost extension till September 30th 2016.

1.3. Demographic and health surveillance in the Ayapakkam household cohort, Chennai

Principal Investigator (NIE)	Dr. Tarun Bhatnagar, Scientist D
Co-Investigators (NIE)	Dr. Prabhdeep Kaur, Scientist D
Funding Agency	NIE Intramural
Start date	2014

Background:

Central Jalma Institute of Leprosy (CJIL) Field Unit, Avadi prior to merging with IRMS, conducted a large Leprosy Vaccine Trial, a double blind randomized control trial where 1,71,400 volunteers were recruited. Cohort for NCD studies was established in Tiruvallur district since 2005. Building on the experiences from all the above mentioned studies, NIE proposes to initiate a household cohort for systematic demographic and health surveillance in the adjoining Ayapakkam area to document various demographic and health indicators on a longitudinal basis.

Objectives:

1. To describe the socio-economic profile, morbidity profile and health seeking behavior of the study population.

2. To describe the births, deaths, migration and other vital events in the study population.

Methods:

Study design: Household Cohort study

Study area: Ayapakkam panchayat area will be included in the cohort

Study participants: All the households and their members in the Ayapakkam panchayat area

Data collection methods: Global Positioning System (GPS) mapping of households and key landmarks in Ayapakkam panchayat area. Whole area is divided into seven clusters with approximately 2000 households in each. Pre-tested, structured questionnaire in Tamil that includes various sections on household characteristics, socio-economic profile, morbidity and treatment seeking behavior. Data is collected using tablet computers.

Human participants protection: Written informed consent is obtained from all the study participants after explaining the purpose of the study and data collection procedures.

Current status:

The study is currently ongoing.

- GPS mapping and household listing completed: 12,537 households
- Household information completed: 3783/12537 (30.2%)
- Census of household members: 14195
- Individual-level morbidity and health-seeking behaviour data: 13057/14195 (91%)

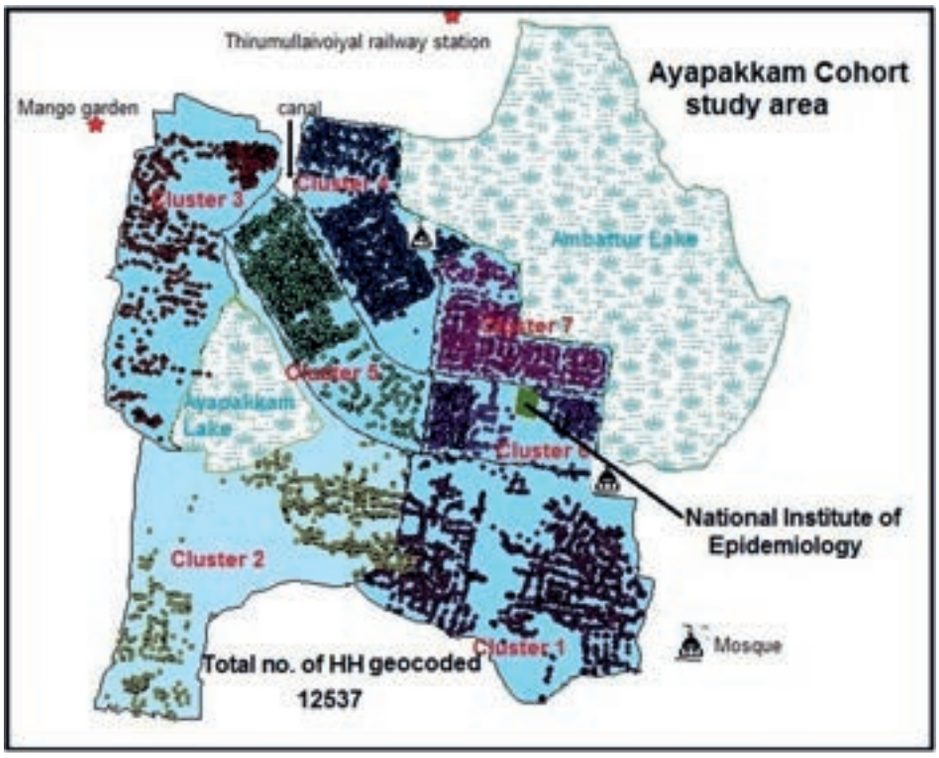


Figure - 1: Digital map of Ayapakkam cohort study area

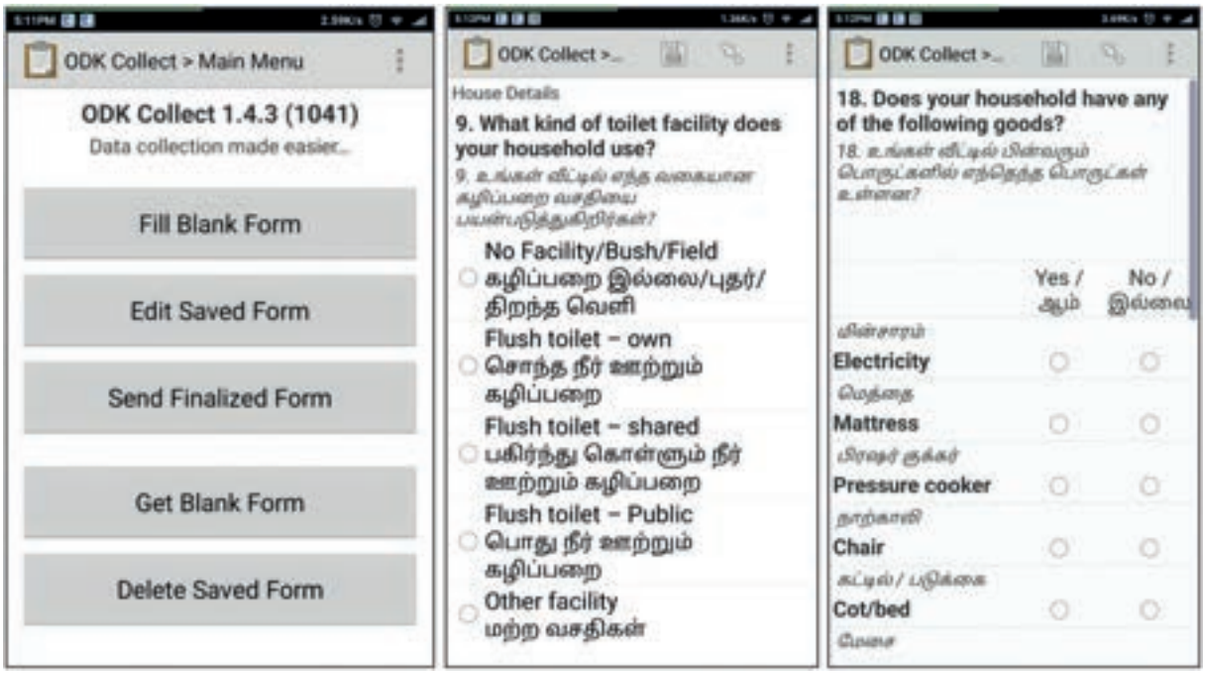


Figure - 2: Tablet-based questionnaire used in Ayapakkam Cohort study

1.4. Virus Research & Diagnostic Laboratories Network (VRDLN)

Principal Investigator (NIE)	Manoj Murhekar, Scientist G
Co-Investigators (NIE)	Vasna Joshua, K Kanagasabai, B K Kirubakaran, M Ravi, V Ramachandran, Ashok M, Mr Sabarinathan, Sanjay Mehendale
Funding Agency	DHR-ICMR
Start date	1 Dec 2013
Status	Ongoing

Background:

The Indian Council of Medical Research and the Department of Health Research, Government of India, have been establishing the Virus Research and Diagnostic Laboratory (VRDL) Network for providing early diagnosis to disease outbreaks in India. As of March 2016, 34 virology laboratories (24 medical college level, 5 state-level and 5 regional level) were established in 23 Indian States (Figure 1). These laboratories, besides providing laboratory diagnosis to disease clusters/ suspected outbreaks, also provide virological diagnosis to patients attending medical colleges. Information about demographic and clinical details and results of laboratory investigations from all the patients investigated are entered in the online/offline data entry system. The National Institute of Virology, Pune is the nodal agency for ensuring quality for laboratory procedures while the National Institute of Epidemiology, Chennai is managing data generated by these laboratories.

Disease clusters diagnosed:

During April 2015 – Mar 2016, VRDLs provided diagnosis to 229 disease clusters (Fig 2). These included Measles (n=99), dengue (n=38), chickenpox (n=38) and hepatitis E (n=18) and A (n=10) (Table-1). Majority of the measles outbreaks were from the states of

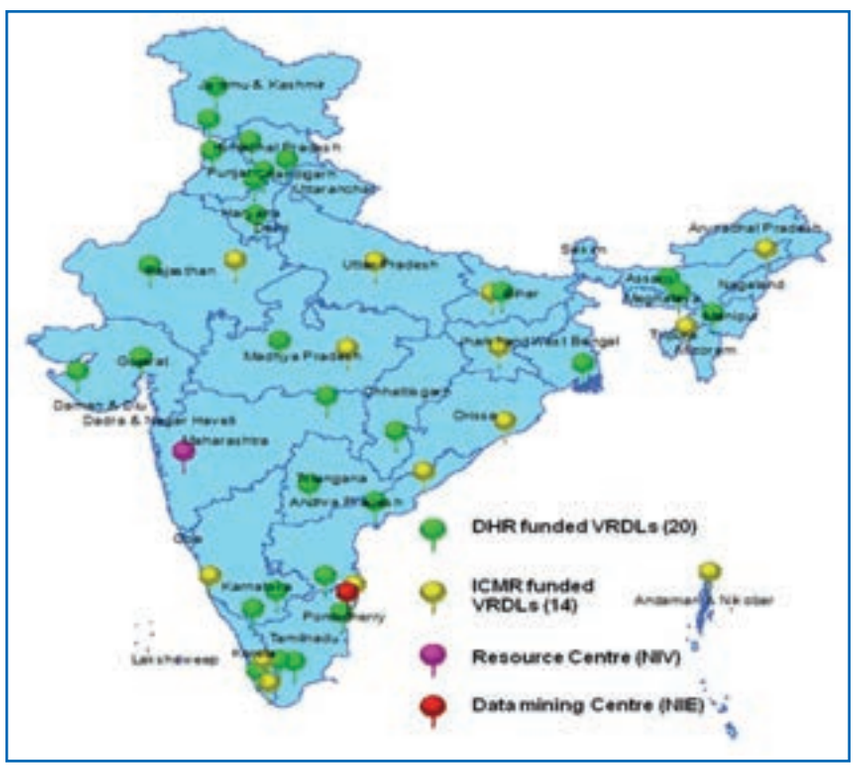


Figure - 1: DHR/ICMR Virology laboratory network

Gujarat (73%), Assam (21%), while the dengue outbreaks were reported from 11 Indian states. Information about the outbreaks diagnosed by VRDLs was communicated to the state IDSP and NCDC within 24 hrs of reporting.

Diagnosis provided to patients attending medical colleges:

Besides providing the diagnosis to 229 outbreaks, VRDLs investigated 100,057 febrile patients attending the medical colleges that housed the VRDLs. The commonly tested viruses included dengue (37657, 38%), influenza A H1N1 (17708, 18%), hepatitis A (7293, 7%) or E (6678, 7%), herpes simplex (5281, 5%) virus and Japanese encephalitis (4790, 5%). The positivity for these viruses was 28%, 14%, 16%, 23%, 6%, and 10% respectively. Age and sex distribution of patients positive for these viruses are summarized in table-2.

Conclusions:

VRDLs are providing timely diagnosis to disease clusters as well as generating case-based data about important viral infections in the country.

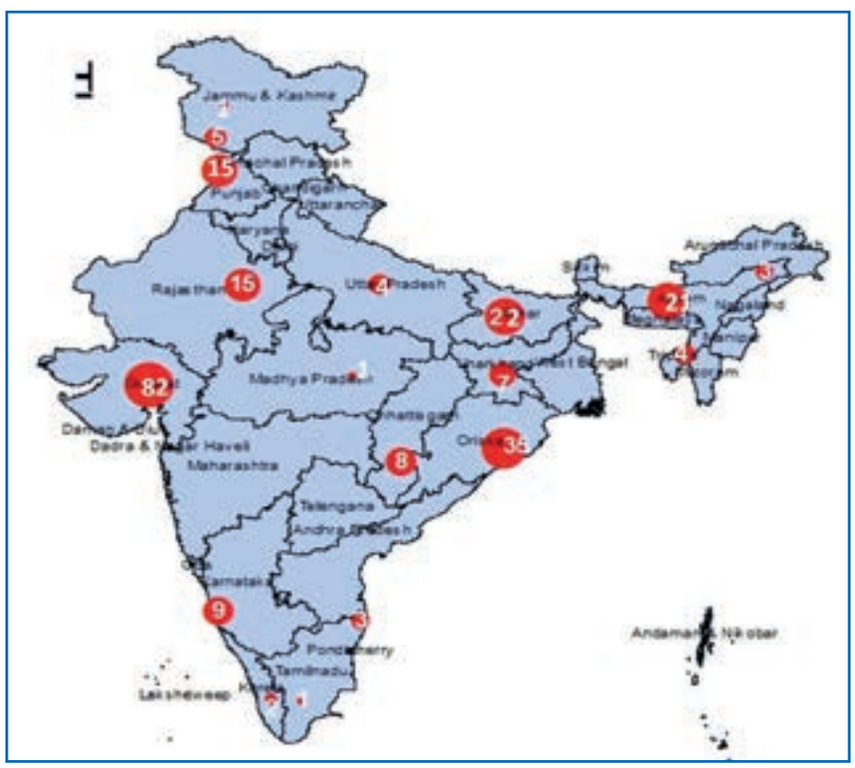


Figure - 2: Disease clusters diagnosed by VRDLs

Table 1: Common disease clusters diagnosed by the VRDLs and their distribution across the country, 2015-16

Clusters	Total clusters diagnosed	States (no. clusters)
Measles	99	Gujarat (72), Assam (21), Tripura (4), Odisha (2)
Dengue	38	Rajasthan (11), Odisha (6), Jammu & Kashmir (5), Punjab (4), Tamil Nadu (4), Jharkhand (2), Assam (2), Chattisgarh (1), Karnataka (1), Kerala (1), Madhya Pradesh (1)
Varicella zoster	38	Bihar (22), Chattisgarh (7), Jharkhand (5), Karnataka (2), Odisha (2)
Hepatitis E	18	Odisha (10), Punjab (6), Karnataka (1), Gujarat (1)
Hepatitis A	10	Odisha (8), Punjab (2)

Table 2: Age and sex distribution of laboratory confirmed cases investigated by VRDLs

	Dengue	Influenza A/ H1N1	Hepatitis A	Hepatitis E	Herpes Simplex	Japanese encephalitis
Age group						
<=1	145 (1%)	119 (5%)	21 (2%)	11 (1%)	81 (25%)	16 (3%)
2-5	535 (5%)	175 (7%)	338 (29%)	49 (3%)	39 (12%)	71 (14%)
6-14	1647 (16%)	110 (4%)	449 (38%)	90 (6%)	27 (8%)	125 (25%)
15-45	6836 (65%)	1143 (45%)	222 (19%)	916 (60%)	147 (45%)	143 (29%)
>45	991 (9%)	986 (38%)	48 (4%)	227 (15%)	27 (8%)	134 (27%)
No data	305 (3%)	30 (1%)	90 (8%)	239 (16%)	5 (2%)	2 (0%)
Sex						
Male	7064 (68%)	1171 (46%)	693 (59%)	1068 (70%)	140 (43%)	303 (62%)
Female	3395 (32%)	1392 (54%)	475 (41%)	464 (30%)	186 (57%)	188 (38%)
Total	10459	2563	1168	1532	326	491

2. OUTBREAK INVESTIGATIONS

2.1. Measles outbreak in Tondiarpet and Royapuram zone, Chennai, Tamil Nadu, 2015

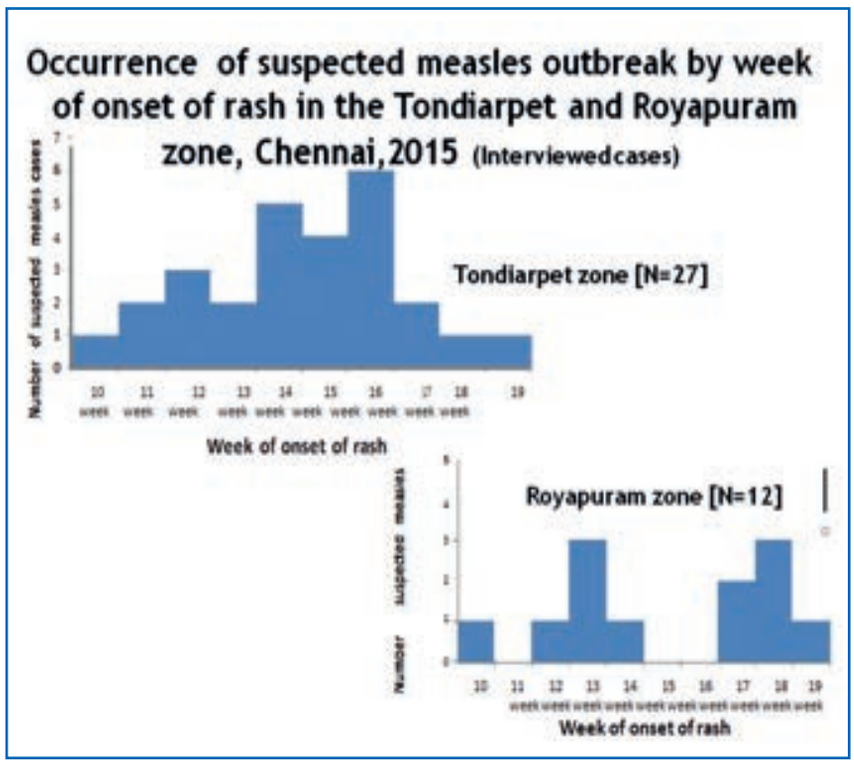
Dr. VV Banurekha, MPH 7th cohort

Introduction:

Outbreaks of measles were flagged during February for Tondiarpet and April for Royapuram zone by Integrated Disease Surveillance project (IDSP) in Chennai, 2015. The objectives of the investigation were to confirm the existence of measles outbreak and to describe time, place and person distribution of measles outbreaks. In addition, the effectiveness of measles vaccine was determined.

Methodology:

The study period was from 27th May to 3rd June 2015. The IDSP reports and line list of measles cases from the zones were examined. Definitions used to describe suspected and laboratory confirmed measles were according to IDSP guidelines. Information on demography, presenting signs and symptoms, vaccination status from measles cases notified since1st March 2015 onwards was collected. Serum was examined for measles IgM specific antibodies. A case-control study using 2 neighbourhood controls per case was conducted. Demographic



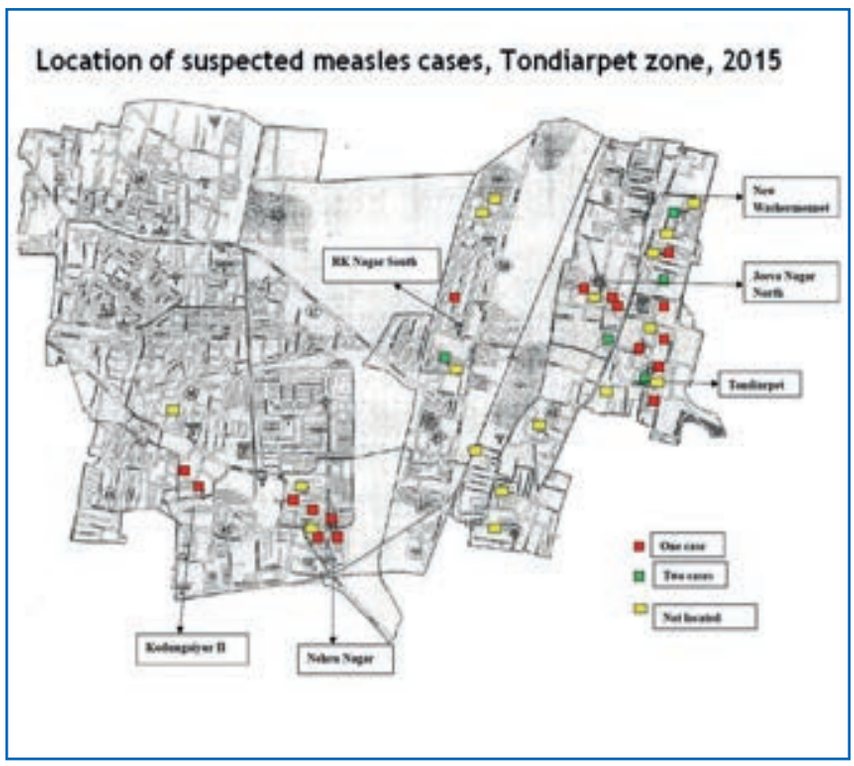
and vaccination details were collected from controls. Epicurve was drawn based on the week of onset of rash and the location of cases was plotted using the zone map. Odds ratio was calculated by matched-pair analysis and vaccine effectiveness was computed.

Results:

Measles outbreak was confirmed according to the definition of 5 or more suspected measles cases reported from one block in a month. Of the 69 cases in the line-list, 39(60%) were interviewed. Measles IgM was negative in one case and results were awaited in 3 cases. The epi- curve based on the week of onset of rash and week of notification of suspected measles suggested a propagated pattern. The attack rate was high in <1 year of age [7.8/10,000] and among females [2.2/10,000]. Measles vaccine efficacy ranged from 66%-98%.

Conclusion:

About 66%-98% of the potential measles cases in the Tondiarpet and Royapuram zone, Chennai could have been prevented by vaccination. Health authorities should consider catch-up vaccination campaigns to improve measles vaccination coverage to prevent outbreaks in future.



2.2. Measles outbreak in V. Chithur, Thozhudhur PHC, Cuddalore District, Tamil Nadu, 2016

Dr. Baranidharan B, MPH 7th cohort

Background:

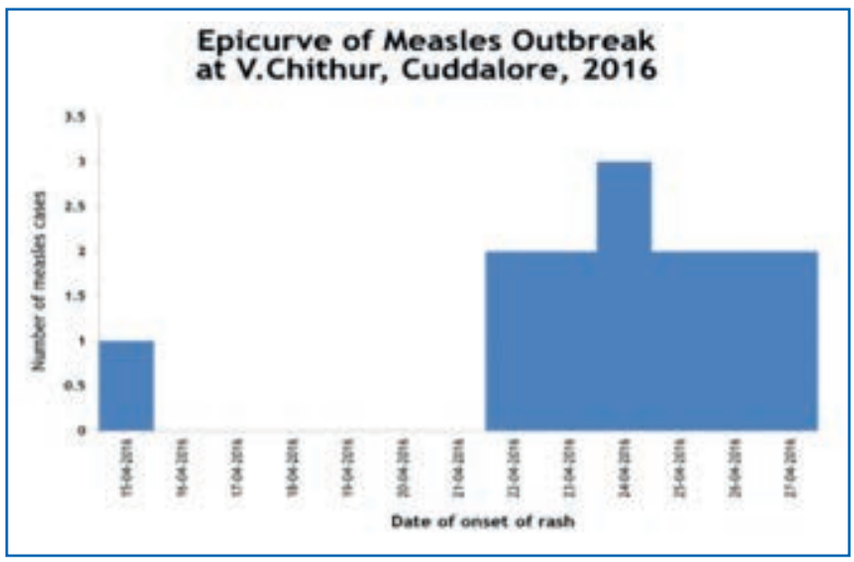
Measles, a highly infectious vaccine preventable disease, is widespread and spreads easily due to overcrowding. Globally, 314 people died every day due to measles in 2014. More than 50% of global deaths due to measles were from India in 2013. In India, 81739 measles cases [Incidence rate 62.35 per 1000, 000] in 2015. In April 2016, 6 suspected measles patients were reported from Thozhudur Primary health centre. Our objectives were to confirm existence and diagnosis of measles outbreak. To describe the outbreak in time, place, person characteristics. We estimated the coverage and effectiveness of measles vaccine.

Methods:

A suspected case of measles was any person presenting with fever and maculo papular rash, cough, coryza or conjunctivitis while a confirmed case was IgM positive for measles. We conducted active case searches and collected five serum samples from suspected patients. We conducted Retrospective cohort study among 9 to 168 months old children to estimate vaccine coverage and effectiveness of measles vaccine.

Results:

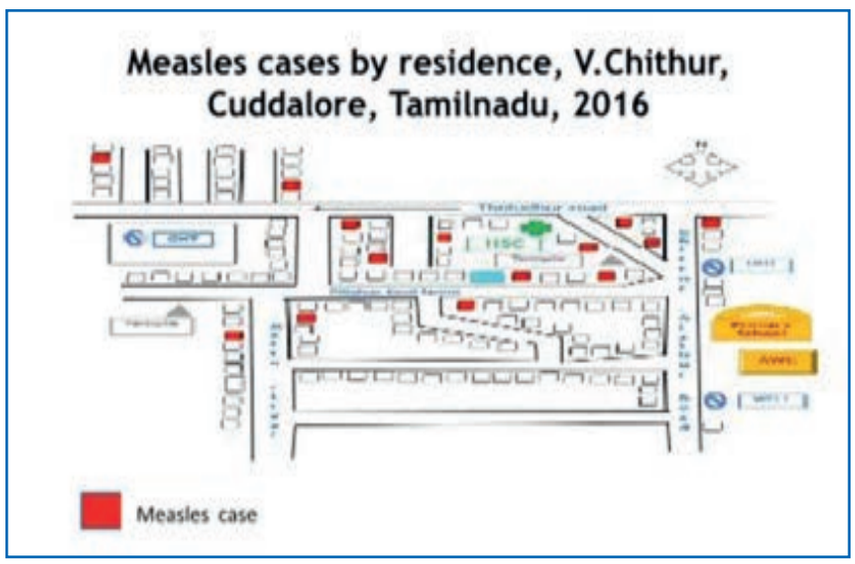
We identified 14 case patients with attack rate 11 percent and case fatality rate 0 percent. We sent five specimen and all were laboratory confirmed for IgM for measles. Most of the case patients were between four to nine years of age 13 (93%). Probable source of contact was school as 12 (86%) studied from same school. Attack rate was highest (19%) among four to nine years age group followed by nine to fourteen years (9%). Attack rate was higher among female children (13%). Attack rate among unvaccinated was 13 percent and 12 percent among those received single dose. Vaccination status and suspected measles was not significant with relative risk 0.85, 95% CI



0.26 –2.80, p value0.73. Vaccine coverage of measles containing vaccine 1 and 2 were 81 percent, 17 percent respectively. Vaccine efficacy of MCV1 was 15.36% (95% -180-74.4). Reasons for not vaccination were child sick 2(8%), non availability during vaccination 19 (79%) and unaware 3 (13%)

Conclusions:

We confirmed measles outbreak at V.Chithur village. More than three fourths of cases were vaccinated for measles. Primary vaccine failure may have increased susceptibility. We recommended providing a second opportunity for measles vaccination.

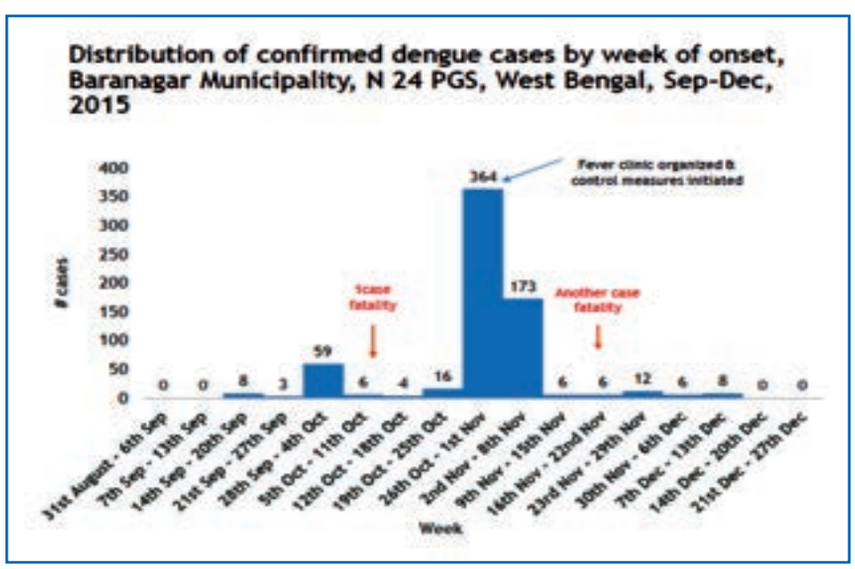


2.3. Dengue fever outbreak, Baranagar Municipality, North 24 Parganas, West Bengal, September – December 2015

Dr. Falguni Debnath, MPH 7th cohort

Background:

In November 2015, a death due to fever and increased number of fever cases were reported from Baranagar Municipality of North 24 Parganas district of West Bengal, India. We investigated the episode to (1) confirm existence of an outbreak (2) describe it in terms of time, place and person (3) determine the cause of outbreak and (4) recommend control measures.



Methods:

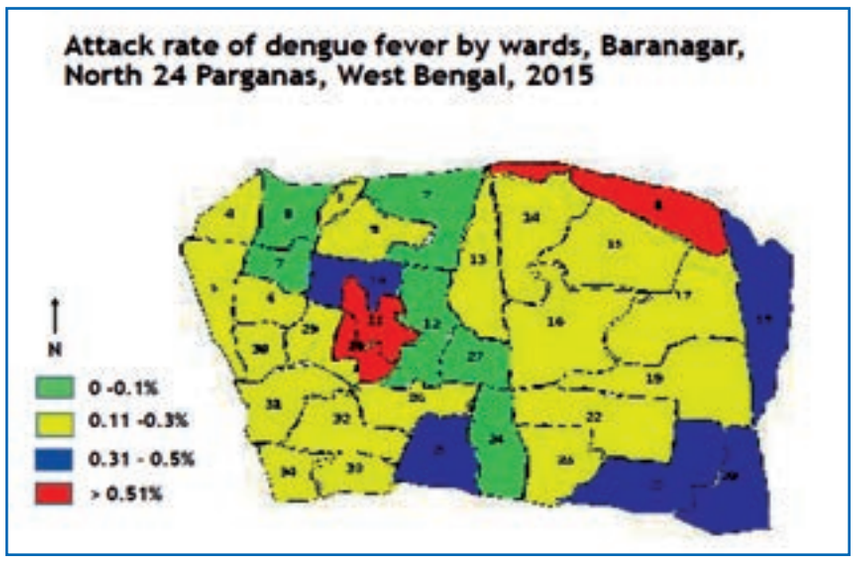
We calculated monthly incidence of dengue from 2012-2014 and compared with 2015 to confirm outbreak. We used the IDSP definition and searched for suspected dengue cases by doing door-to-door case search in the ward with the highest attack rate. We actively searched for cases in the health facilities. Through this process, we collected information on date of onset, symptoms, socio-demographic, awareness related to dengue serological reports and clinical outcome for confirmed dengue cases. We collected blood for Non-Structural Antigen1 ELISA test. We did environmental and entomological survey.

Results:

As of December 2015, 671 cases (Overall attack rate=3 per 1000) and one death (Case fatality=3 per 1000) was reported. Attack rate was highest in ward no 1 (0.7%) and was 3 per 1000 among the females. All the age groups were affected. Over 30% almost one third required hospitalization. ELISA was positive for 612 cases. Out of interviewed 31 cases, 94% had headache, 90% had myalgia, followed by arthralgia, rash in body, retro -orbital pain, abdominal pain, loose stool. Out of 41 interviewed suspect and confirm dengue cases 68% (n=29) knew that dengue fever spreads via mosquito and 15% (n=6) knew correctly the time when Aedes aegypti bites. Only in ward no 1, house index was >5%.

Conclusion:

We confirmed Dengue outbreak. All the age groups got affected. Deaths occurred in this outbreak. Potential breeding sources were present in ward no.1. Awareness regarding dengue was poor among the interviewed fever case patients.



2.4. Dengue fever outbreak, in Rajapalayam municipality, Tamil Nadu, 2014

Dr. Saroja M, MPH 7th cohort

Background:

As a result of changes in climatic conditions and greater resistance to insecticides many regions across the globe, including India have a resurgence of vector born diseases, dengue fever in particular. Timely information is needed to plan and target preventive interventions. Rajapalayam municipal area reported 68 dengue cases in 2014 as compared to 2012.

Objectives:

Confirm the existence of outbreak, Describe outbreak in terms of time, place, person, and determine the cause of outbreak, Recommend control measures.

Methods:

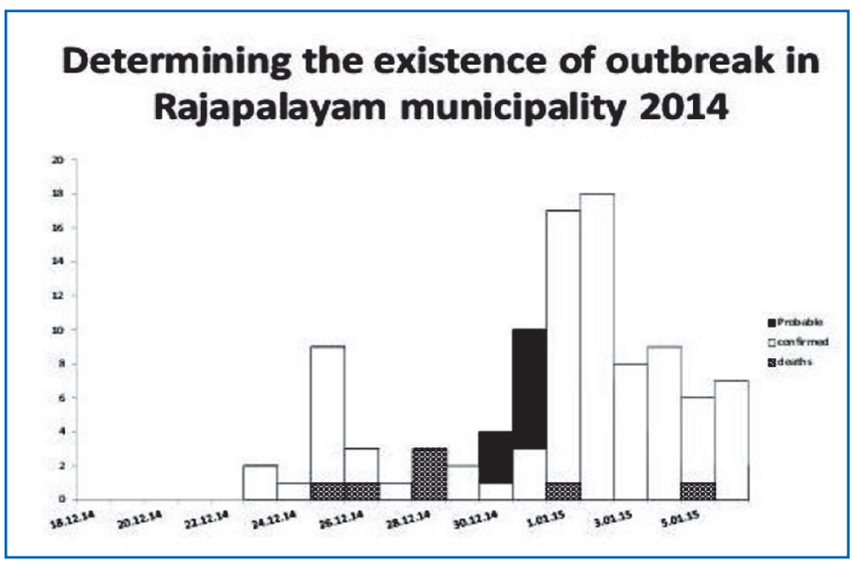
We have done active surveillance in ward 39 by collecting household and individual data and compare the house indices and breteau indices Data Analysis was done for the following: (1). Description of time trend of occurrence of cases by Epi curve, (2). Calculation of age specific , sex specific attack rate and case fatality ratio,(3). Description of symptom profile. Water analysis and Lab test were done for confirmation of dengue.

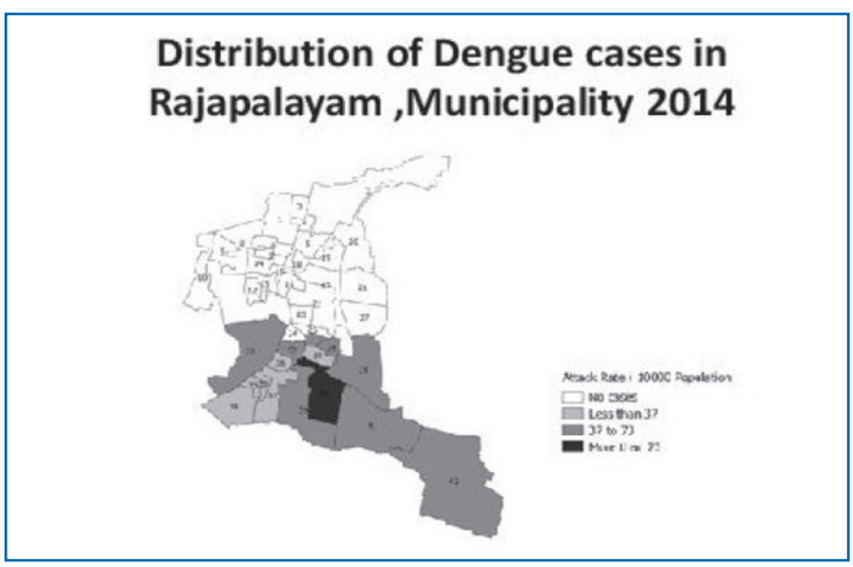
Results:

We have reviewed the reported data on dengue cases from Rajapalayam municipality during 2012-2014. Out of 210 cases reported with fever 68 cases were confirmed dengue, IGM positive for Elisa. Age wise attack rate were high in the age group of 6-14 years (3.9). In gender the attack rate was high in males than females (1.8,1.40) respectively. Six deaths were reported in the month of December and the total case fatality rate was 2.8. 68/210 reported vomiting as major complaint 80/212 38% serum samples of suspected Dengue patients, 30 with NS1 antigen capture ELISA. Water Environmental survey findings was done but water samples were potent for drinking. The house index which was 18.5 reduced to 4.95 after control measures.

Conclusions:

Based on the descriptive findings, environmental survey, lab report the fever outbreak is due to vector borne disease– Dengue fever. Ward No. 39, 28 are most affected. Larval indices were higher in areas with higher attack rates. Unhygienic practices, lack of civic sense, usage of plastic cups, poor solid waste management are the precipitated factors for fever outbreak.





2.5. Effectiveness of Measles Containing Vaccine (MCV) in a measles outbreak in Thiruvottiyur zone, Chennai district, Tamil Nadu, 2015

Dr. Bhavani P K, MPH 7th cohort

Background:

India accounts for > 50% of global deaths due to measles in 2013. India has an incidence rate of 62.35 measles cases per 1000,000 in 2015. Low coverage of Measles containing vaccine (MCV) remains an important cause of measles outbreaks in country. A suspected measles outbreak was reported on 15th May 2015 from Thiruvottiyur zone, Chennai district. We investigated it to confirm aetiology and estimate effectiveness of MCV.

Method:

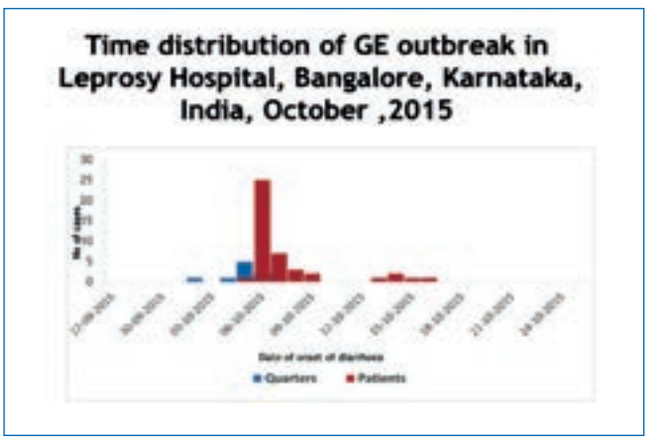
We did 1:2 neighbourhood matched case control study. We defined a case with occurrence of fever with rash between March to June, 2015 with one of the 3 symptoms: cough, coryza, conjunctivitis. A neighbourhood control was any child aged below 15 years without symptoms during the reference period, residing in the neighbourhood for the past 6 months. We collected and tested blood samples from 5 case-patients. We described the distribution of case-patients by time, place and person. We estimated the vaccine efficacy using 1-OR formula. Matched Odds ratio calculated for association between vaccination status and measles.

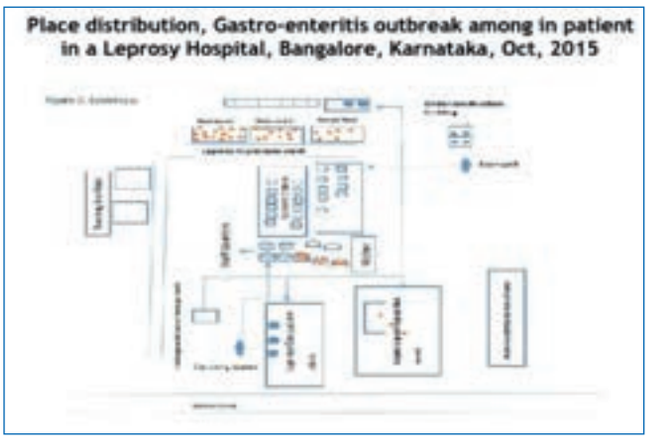
Results:

We identified 43 cases and 85 controls. Overall attack rate was 6% and no deaths were reported. All the 5 sera were negative for IgM antibodies against measles. The median age of cases was 5 years (IQR4-7). Measles cases started occurring from 10th week of 2015, peaked during 14th week to 21st week and declined after 22nd week. 60% (26/43) of cases were aged between 5-9 years. Most cases (68%) were from Ernavoor health post area. 30% of case patients were not vaccinated for measles. Attack rate was higher among children aged 5-9 years (1.03/1000 population) and in males (0.67cases/1000 population). The children who are vaccinated were less likely to acquire measles infection with a matched odds ratio 0.26 (95% CI 0.07 – 0.86). The effectiveness of measles vaccine in Thiruvottiyur zone is 74% (95% CI 70 %-86 %.).

Conclusion:

Attack rate was higher in children aged 5-9 years and in males. About 74% of reduction of measles infection is seen in vaccinated group than unvaccinated group. Steps to be taken to ensure 2 doses of measles vaccine being administered.





2.6. Food poisoning outbreak investigation in Nemilichery, Thiruninravur town panchayat, Thiruvallur district, Tamil Nadu, India, 2016

Dr. Yogananth N, MPH 7th cohort

Introduction:

In May 4 2016, Poonamalle district health officials reported that 10-15 patients of Nemilichery area had vomiting and loose stools after eating food distributed after a public gathering nearby. We aimed to confirm the outbreak and to identify the source of infection.

Methods:

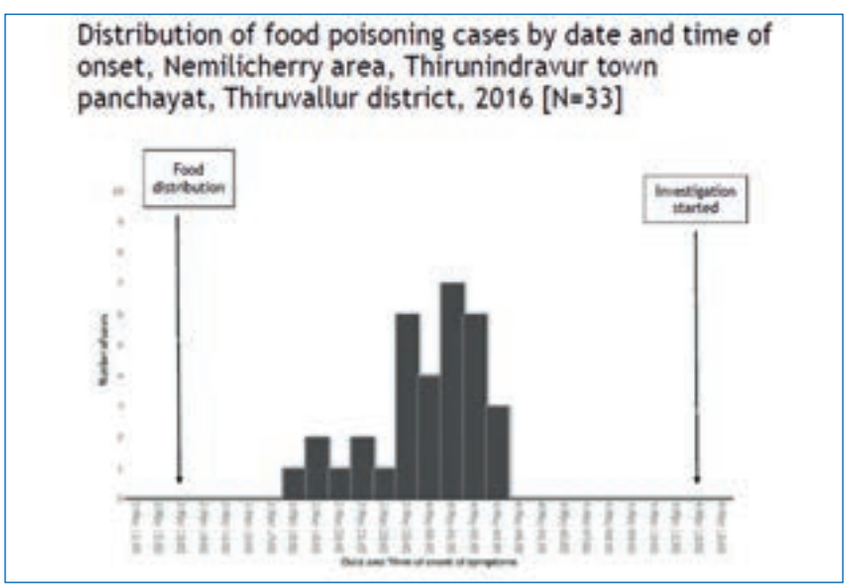
We defined a case as the occurrence of diarrhoea, fever, abdominal pain or vomiting in a resident of Mariamman Kovil Street in Nemilichery area of Thiruninravur town panchayat who consumed food items distributed on 3rd may 2016 after a nearby public gathering. We made a door to door search for the cases. We constructed an epidemic curve, drew a map and calculated incidence by age and sex. We conducted a retrospective cohort study in that area and calculated relative risks for consumption of food items. Vomitus and stool specimen were collected and sent to analysis by local health personnel. Suspected food remains were unavailable for testing.

Results:

We identified 33 cases among 142 residents (attack rate: 23.2%) The disease affected all the age groups and both genders. Attack rate was 23.2%, 19.1% and 27% for overall, male and female gender respectively. Age wise attack rate was high among 10-19 years population.30%, 57%, 87% and 100% case patients had fever, vomiting, abdominal pain and loose stools respectively. Eating tomato rice was associated with the illness [RR: 23.8(95% CI: 7.7 –73.8)]

Conclusion:

We established epidemiological link of food poisoning outbreak with consumption of tomato rice. The population attributable risk was 20. We could not identify the pathogen or its reservoir. We recommended to monitor the food preparation and distribution after public gatherings by health authorities.



2.7. Outbreak of Measles at Bardhwaja, Howrah, West Bengal, 2014

Dr. Nilanjan Mondal, MPH 7th cohort

Background:

India accounted for about 50% of global measles deaths in 2013. Low coverage of MCV remains an important cause of measles outbreaks in country. A suspected measles outbreak was reported on November, 2014 from Bardhwaja village. We investigated it to confirm aetiology and estimate coverage and effectiveness of MCV.

Method:

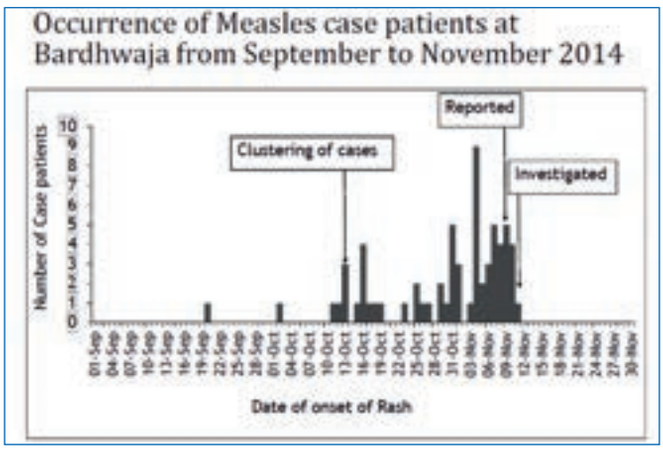
House to house survey was conducted among 0-15years children (n=613) to identify measles cases, defined as occurrence of fever with rash with one of the three: cough, coryza, conjunctivitis. We collected and tested blood samples from 8 case-patients. We described the distribution of case-patients by time, place and person. We estimated the coverage and 95% confidence interval (95% CI) of measles vaccine effectiveness using 1- RR formula.

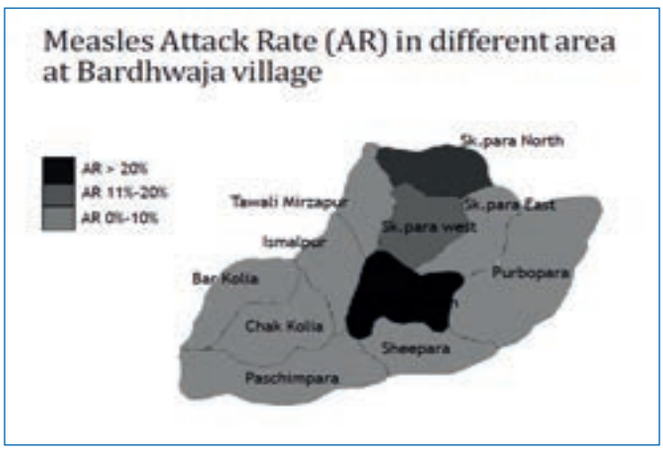
Result:

We identified 68 measles case-patients, attack rate: 11.1% with no death (CFR: 0%). All the eight sera were positive for IgM antibodies against measles. Measles cases started occurring from 2nd week of September, 2014, peaked during last week of October and declined during November. Median age of case-patients was 84 months (IQR: 54-114months); Vaccine coverage of MCV1 among 9 months to 15 years' children was (316/521) 60.6% and that of MCV2 among 16 months to 5 years' children was (62/98) 63.2%. Compared to unvaccinated children who received one [RR:0.17, 95% CI 0.09-0.3] and two doses [RR:0.09, 95% CI 0.02-0.4] of measles vaccine were at lower risk of getting measles. The risk of measles was higher among children of religious minority (RR: 28.3, 95% CI: 7 to 114.5). Vaccine Effectiveness of one and two doses of measles vaccine was 82.79% (95% CI 69.09-90.42) and 90.32% (95% CI 59.18, 97.71) respectively.

Conclusion:

Vaccine coverage was lower than district target (80%) especially among children of religious minority. We recommended frequent outreach immunization camp at Bardhwaja.





2.8. Outbreak investigation of Acute Diarrheal Disease in Vettuvanam / Ambedkar Nagar village, Pallikonda, Vellore HUD, Tamil Nadu, 2015

Dr. Velmurugan Ganesh G, MPH 7th cohort

Introduction:

On 1st June 2015, eight suspected diarrhoeal cases from Vettuvanam and Ambedkar nagar village were reported in Pallikonda PHC, Vellore HUD. Subsequently medical camps organized at Vettuvanam village and 3 water specimen collected for analysis at Government Vellore Medical College. One specimen confirmed for Salmonella paratyphi out of 3 specimens. So we investigated to identify the source of infection and recommend control measures.

Methods:

We did active case finding by house to house surveillance with semi-structured questionnaire for descriptive study. We defined confirmed case as any person who is resident of Vettuvanam/Ambedkar village with complaints of passage of 3 or more loose/ watery stools in past 24 hours along with or without dehydration between 29 May 2015 and 05 June 2015. We did neighbourhood household matched case control study. We did purposive sampling to match the 144 cases households and 144 controls households with sample size 1:1 ratio for analytical study. We hypothesized no association between the consumption of panchayat water and occurrences of ADD outbreak in Vettuvanam/ Ambedkar village. We compared the cases and controls to calculate the OR and 95% CI. We calculated AR %, PAR & PAR %.

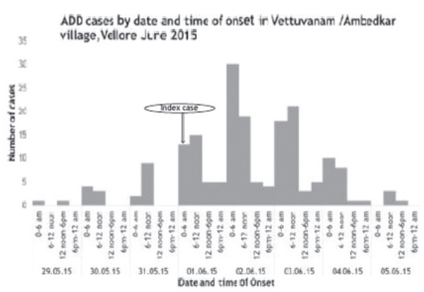
Results:

We identified 217 cases in 165 households in exposed population of 4299 in both villages with village attack rate as 5.04%. The attack rate was 5.62 in females. The attack rate was higher in age group below 4 years (10.4%). The index case reported on 1st June 2015. Panchayat water supply stopped and tanker water supplied to Vettuvanam and Ambedkar village. All valves in junction point were checked. No deaths reported. We found unboiled water (OR-5, 95% CI-1.8, 14.3) and unfiltered water (OR-4.5, 95 % CI-1.8, 11.4) water were significant factors for ADD outbreak. The AR% and PAR% for unboiled water was 80% and 93% and for unfiltered water was 78% and 88% respectively.

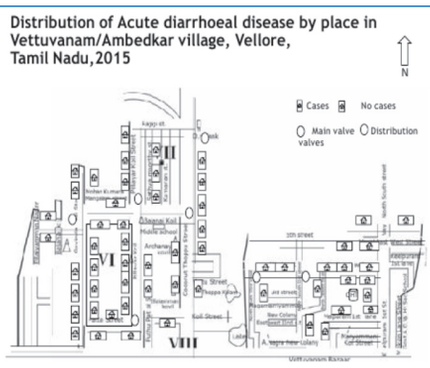
Conclusion:

In the absence of other risk factors consumption of unfiltered and unboiled panchayat water by the people of Vettuvanam and Ambedkar village would have caused the outbreak. We recommend proper cleaning of over head tanks, chlorination of water and regular checking of the valves in all streets. Sensitise the people to use filtered and boiled water for drinking.

Distribution of Acute diarrhoeal disease by date and time of onset in Vettuvanam /Ambedkar nagar village,Pallikonda, Vellore HUD,2015



Distribution of Acute diarrhoeal disease by place in Vettuvanam/Ambedkar village, Vellore, Tamil Nadu,2015



2.9. Dengue fever outbreak investigation at Baranagar Municipality, North 24 Parganas, West Bengal, September – December' 2015

Dr. Ansari Md Rafiquddin Md Kabeeruddin, MPH 7th cohort

Introduction:

We investigated the outbreak as a suspected outbreak of measles with the objectives of confirming diagnosis, estimating the magnitude of outbreak and formulating recommendations for control and prevention.

Methods:

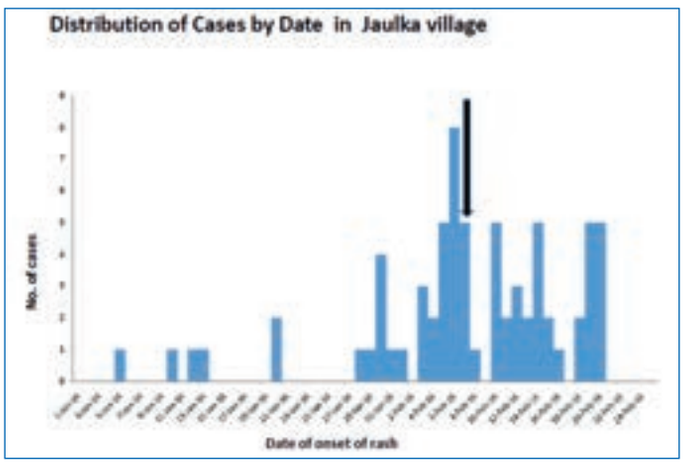
We defined a case of the rubella as occurrence of fever with rash in any resident of Jaulka village between 1st January to 28th February 2016. We line listed the cases and collected information on age, sex, residence, date of onset, symptoms, signs, treatment history, vaccination status and pregnancy status. We described the outbreak by time, place and person characteristics. Sera of a sample of case patients were tested for IgM antibodies to measles and later rubella viruses.

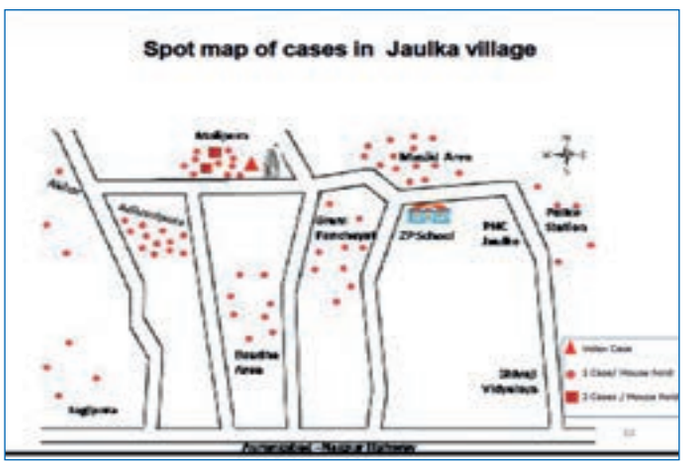
Results:

We identified 70 cases in village. The overall attack rate (AR) was 4.77%. Sex specific AR for males was 4.65% and females 4.9%. All case patients were less than 21 years of age and the attack rate was highest in the age group 5 to 16 years (median age 8.2 years). The index case was traced in Malipura and occurred on 6th February 2016. No pregnant woman was found to be affected. The number of cases peaked on 8th February and the last case was reported on 20th February 2016. Of 70 case-patients, none of them were immunized against rubella. Out of ten blood samples tested, all tested negative for measles IgM antibodies but seven were positive for IgM antibodies to rubella.

Conclusion:

An outbreak of rubella was confirmed. We advised the local health authorities to provide MMR vaccination to the unexposed and energetic IEC activities in pregnant women and the susceptibles.





2.10. An outbreak of chickenpox in Pethanayakkanpatty village, Namakkal District, Tamil Nadu, India 2016

Dr. Viduthalai Virumbi B, MPH 7th cohort

Introduction:

On 11th April, 2016 one suspected case of chickenpox reported to SSU from Pethanayakkanpatty, Namakkal District. On the next day PHC Medical Officer verified 5 more cases and on 13th April 4 more cases was reported by health workers. Presence of two epidemiologically linked cases of clinically diagnosed chickenpox needed systematic outbreak investigation.

Methods:

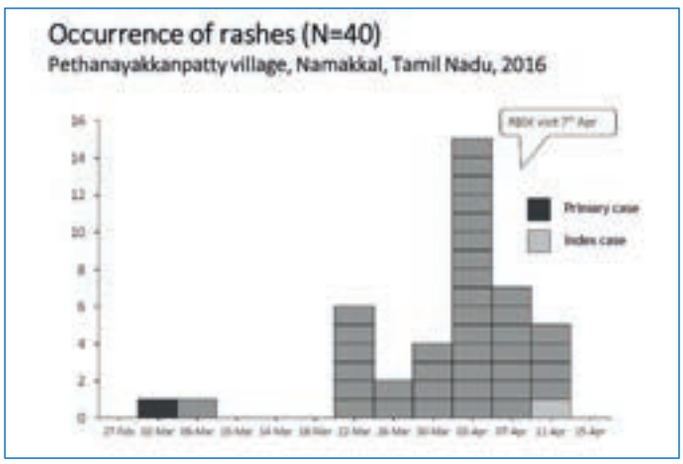
We defined suspected cases as 'Occurrence of fever and rash among Pethanayakkanpatty village residents, Namakkal District from 2nd March 2016' and probable cases as 'Occurrence of fever with acute onset of diffuse (generalized) rashes without any other apparent cause in the village residents [IDSP]'. We did active search for cases in the village (door-to-door) on 14th April. We described the outbreak using epicurve, spot map, area map and person characteristics. We calculated attack rates and dose response for exposure among at risk population.

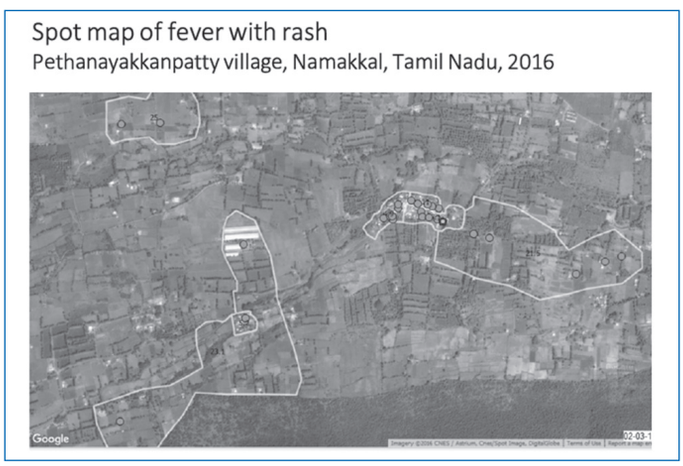
Results:

40 cases among 536 residents reported with suspected case definition and all fitted into probable case definition. 435 had no past history of chickenpox. No high risk cases were identified. Outbreak started on 02.03.2016 and lasted till 12.04.2016 with two peaks. With overall 9% attack rate, field head had 21.5-25%, female had 13% attack rate and 65% attack rate among female aged 5 to 14 years and higher than male in all areas. Household attack rate was 60% and Secondary attach rate was 56%. 41% cases treated with acyclovir and all with inadequate dosage. School going had (OR 22, 95% CI 10-53) higher risk for getting chickenpox and dose dependent relationship was noted between school exposure and risk of illness and it's statistically significant.

Conclusion:

Attack rate was higher among female, school going age group and residents of field heads. Spread of outbreak was likely from school and household exposure, and higher among villagers having school exposure. We recommend to establish a system for early notification of suspected cases from school setting, acyclovir treatment with adequate dose and establish lab confirmation for fever with rash clusters.





2.11. Investigation of an outbreak of Chicken Pox in Jittobanapalli village, Krishnagiri district, Tamil Nadu, 2016

Dr. Vijayalakshmi V, MPH 7th cohort

Introduction:

Chickenpox (Varicella) is a highly contagious disease caused by Varicella Zoster virus (VZV). It is benign in immune competent, but life-threatening in adults & immune compromised and attack rate is >85% after exposure. Globally, 4.2 million cases require hospitalization and 4200 deaths annually. One in 40,000 cases results in death due to encephalitis, especially among immune compromised. In March 2016, there was a rise in chickenpox cases in Jittobanapalli village of Krishnagiri district.

Methods:

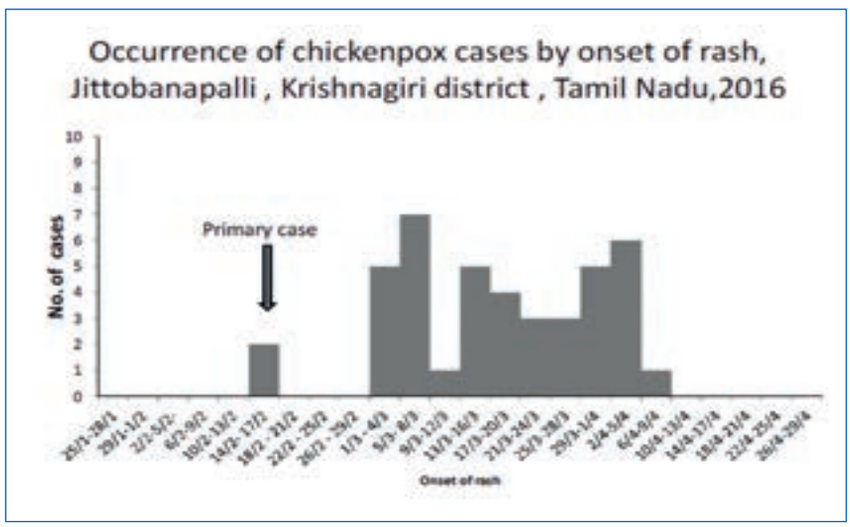
We have done a descriptive study, among the households of Jittobanapalli village, Krishnagiri district, Tamil Nadu. Active case search was done and collected information regarding Chickenpox in a semi structured questionnaire. We calculated attack rates in Epi info version 3.5.4.

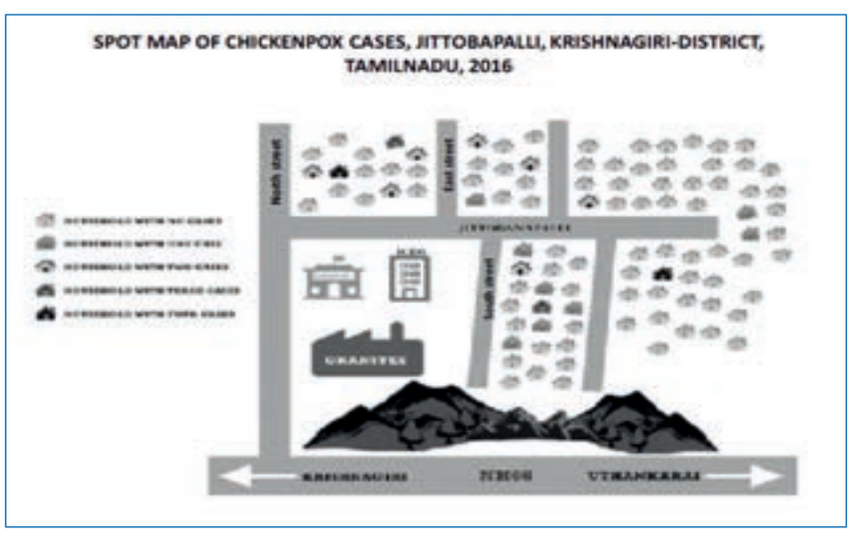
Results:

Chickenpox outbreak was between February to April. Over all attack rate was 5.6 per 100 population and more among males (6.6%), in 5-9 yr old children (41%). Infants constitute13% of the cases and the attack rate was less among 15 and above. The epi curve shows multiple peaks which indicate active transmission. Clustering of cases were seen in north, south and east streets.

Conclusion:

Isolation of the cases and health education regarding personal hygiene was given. Regular training is needed for the field health workers to pick up the cases on time and prevent such outbreaks.





2.12. Investigation of an outbreak of dengue in a rural part of West Bengal, India, 2014

Dr. Biswajit Dey, MPH 7th cohort

Background:

During October, 2014 an increased number of fever cases were reported from 3 villages in a block of Murshidabad district, West Bengal, India. We investigated that outbreak with the objectives: to describe the distribution of cases, to find out the cause & source of infection.

Methods:

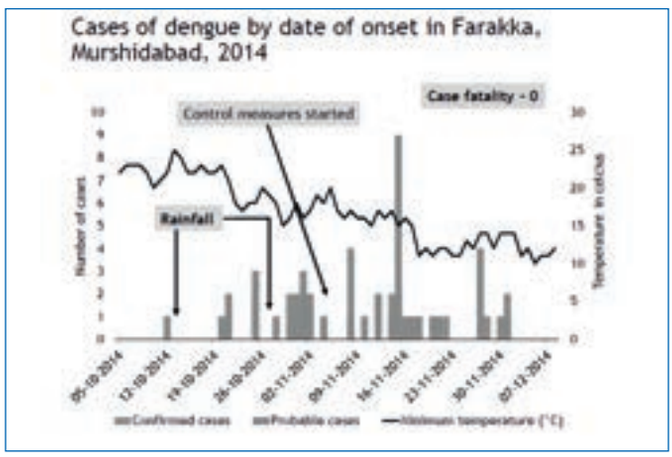
We did active case search based on the IDSP case definition and set up stimulated passive surveillance. We did clinical & serological examination of all the suspected patients. We also did environmental and entomological surveys. We analysed the outbreak in respect to time, place & person and computed entomological indices.

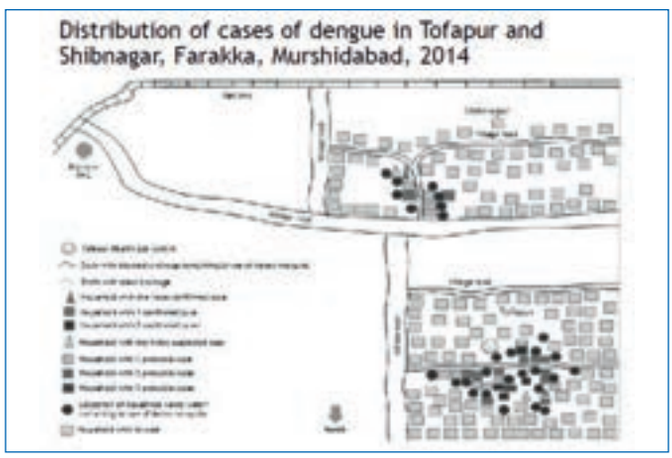
Results:

The outbreak ranged from 12th October, 2014 to 1st December, 2014 and peaked between 25th October and 27th November. Out of 63 suspected patients 23 (37%) were confirmed by IgM Capture ELISA (MAC-ELISA). 59% (37/63) of the cases were females. Attack rates: Female – 12/1000 population, Male – 8/1000 population. Among the affected villages Attack Rate was highest in Tofapur (25/1000 population) followed by Shibnagar (7/1000) and Arjunpur (6/1000 population). Attack Rate was highest in 20-39 years age group (11/1000 population). All the patients (100%) had fever, 62 (98%) had headache, 43 (68%) had myalgia & 29 (46%) had retro-orbital pain. Only 1 (2%) patient complained of haemorrhagic manifestations. All cases recovered. Breteau Index of the three villages were: Tofapur – 21; Shibnagar – 9 & Arjunpur – 5. We detected breeding of Aedes aegypti mosquitoes in peri-domestic collection of water.

Conclusion:

The outbreak was of dengue fever due to increased density of Aedes aegypti mosquitoes with higher Attack Rates in females and younger age group. Peri-domestic collection of water was the source of infection.





2.13. Investigation of an outbreak of "Shellfish Poisoning in Cuddalore Municipality, Tamil Nadu, India, 2015"

Dr. Vinaykumar K, MPH 7th cohort

Introduction:

It was reported that 14 persons admitted at the District Headquarters Hospital with complaints of vomiting and giddiness, from Navaneetha Nagar, Ward 43 of Cuddalore Municipality Area on 29th January, 2015. District epidemiologist reported incident to State IDSP unit, Chennai on 2nd February 2015. It was reported that all affected had consumed clams, a shell fish which was purchased from an unknown vendor at Navaneetha Nagar on 29th January 2015. We investigated this outbreak.

Methods:

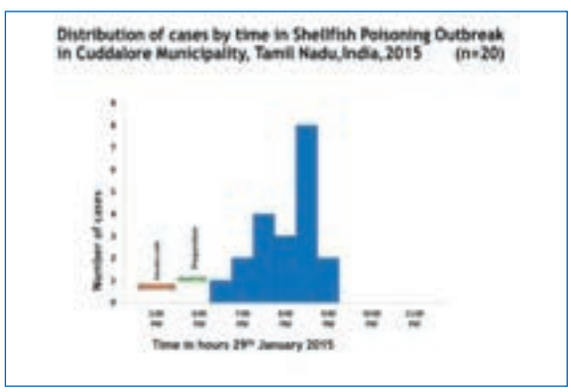
We defined case as "Vomiting or dizziness in a person of any age in Navaneetha nagar, Ward 43, Cuddalore Municipal area, Cuddalore from 28th to 30th January 2015". House to house survey done to identify more cases. Global Food Infection Network (GFN) 3 day food frequency questionnaire administered by RRT to first 14 cases identified. Socio demographic details and symptoms of affected persons were recorded. Ten uneaten discarded shell samples collected and sent to Institute of Marine Biology, Annamalai University for identification and analysis. Data entered in Microsoft excel and analysed.

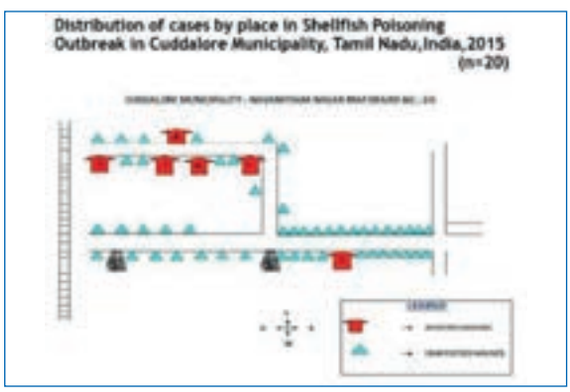
Results:

Fifty five houses visited as a part of house to house survey and an additional six cases were identified, resulting in 20 total cases from 6 households. Of 20 cases, 9 (45%) were male. Maximum attack rate (28.6%) seen in age group of 60 to 64 years. Among 20 cases, most common presenting symptom was dizziness (19 persons). Median incubation period calculated as 15 minutes (range 0 to 60 minutes). Epidemic curve depicts point source outbreak. Mapping of cases showed no apparent clustering. All 20 affected persons consumed clams on 29th January 2015. Among 202 unaffected, none had consumed clams. Food specific attack rate for clams was 100%.

Conclusion:

With 100% attack rate and 100% case exposure, our investigation supports hypothesis for shellfish consumption being associated with illness outbreak. Symptoms consistent with neurotoxic or diarrheic type shell fish poisoning. Based on epidemiological linkages and discussions with marine toxicologist reports, we concluded that food borne shellfish poisoning outbreak occurred in Navaneetha nagar, Cuddalore. Based on investigation it was recommended to organize targeted educational campaign on signs, symptoms and diagnosis of shellfish poisoning for general public and healthcare providers and to collaborate with Fisheries College and Research Institute, Tuticorin to undertake surveillance for heavy metals toxin and algae levels in clams and water.





2.14. An outbreak of acute diarrheal diseases in Patharai village, Namakkal district, Tamil Nadu, India, 2016

Dr. Vidhya V, MPH 7th cohort

Introduction:

On 29th February, 2016 evening, it was reported that 14 persons were admitted in health facilities and 10 persons were treated as outpatients for complaints of diarrhea and vomiting from Indira Nagar, Patharai village of Pallipalayam block in Namakkal district. Occurrence of 24 cases of diarrhea is an unusual event in Patharai and hence we investigated this outbreak.

Methods:

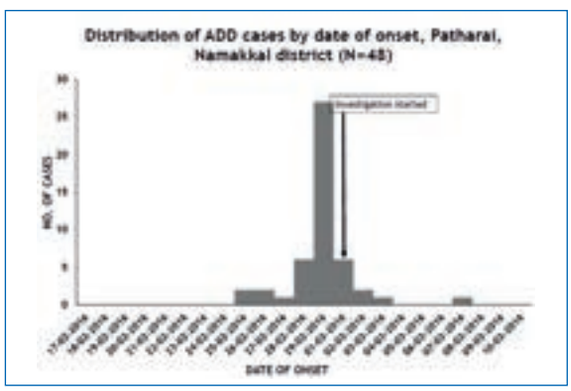
We defined case as "passage of 3 or more loose or watery stools in the past 24 hours with or without dehydration" in a resident of Indira Nagar, Patharai village between 25th February and 10th March, 2016. We did door to door to survey to identify new cases. We collected and sent stool samples of cases and water samples from the OHTs, which is the major source of their water supply to the District Public Health Laboratory (DPHL) in Namakkal district. We did a case control study to identify the source of the outbreak. We used a semi structured questionnaire. For each case, 4 controls were selected either from the same residence or from neighborhood. We entered and analyzed the data in Excel.

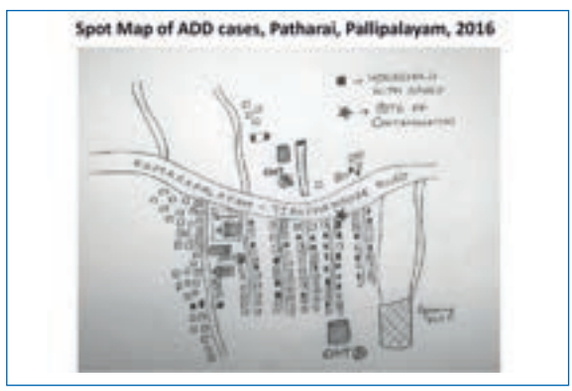
Results:

Of the 48 cases, 12(25%) cases were in street II, 8 (17%), 6(13%), 8(17%) cases were in streets I, III and IV respectively which were supplied by the water from OHT I. Epidemic curve suggests a point source outbreak of a disease with a short incubation period. The attack rate is 19% among the age group of 60 years and above, 13% and 12% among the age group 6-9 years and 45-59 years. On environmental assessment, we found some pipeline repair work was going on from 26th of February, 2016 and during which the distribution line from OHT I on the south side was damaged and possible contamination from the nearby drainage canal was suspected. Also, the practice of letting out of sewage water from septic tanks of the nearby spinning mill was identified. 48 cases and 186 controls were interviewed. The analysis showed drinking of the contaminated OHT water to be significantly related to the subsequent development of the illness. Odds ratio of 5.2 (95% CI – 1.5, 17.56) was obtained. The lab report showed stool samples and water samples positive for coliform bacteria. No chlorination was done in any of the three tanks in the area.

Conclusion:

Our investigation supports the hypothesis of drinking contaminated water from the OHT is associated with the outbreak of the illness. This outbreak highlights the necessity of proper chlorination and periodical supervision of the same. Also, we should monitor frequently the sewage disposal in residential areas with commercial industries nearby.





2.15. An outbreak of chickenpox in Panchayat union Primary school, Pethanayakkanpatty village, Namakkal District, Tamil Nadu, India 2016

Dr. Prakash V, MPH 7th cohort

Introduction:

A case of suspected chickenpox was reported at state surveillance unit, Chennai from Pethanayakkanpatty village of Namakkal district in Tamil Nadu on 11th April, 2016. Five more cases were identified subsequently from same village including four cases from primary school within next two days. Presence of two epidemiologically linked cases of clinically diagnosed chickenpox warrant systematic outbreak investigation.

Methods:

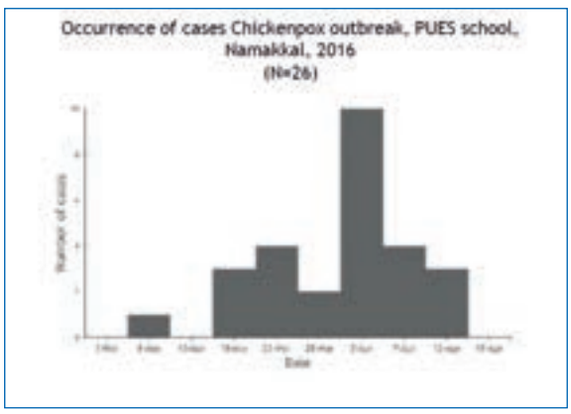
Study was conducted in Pethanayakkanpatty village that included four habitation and one primary school. We defined suspected case as 'Occurrence of fever and rash among school children from 2nd March 2016' and probable cases as 'Occurrence of fever with acute onset of diffuse (generalized) rashes without any other apparent cause in the school children [IDSP]'. Active case search was done for all the school students. Structured standard questionnaires (CDC) were used to interview the children's parents. We described outbreak by time, place and person characteristics. We calculated attack rates by age group and gender.

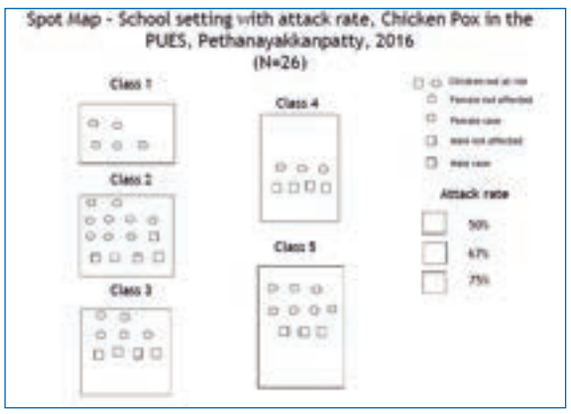
Results:

27 children were affected among the total 45 children in the school. Attack rate was 66%. There were no complications or death among the diseased children. The primary case had rash on 2nd March 2016. There were two peaks within two incubation period of primary case with first peak between 22nd-23rd March and second peak between 3rd-6th April. Attack rate increased with age with 1st standard having 50%, second, third and fourth had 67% and fifth standard had 75%. Attack rate among male and female children were 81 and 39 percent respectively. Overall secondary attack rate was 56% in the school and it was highest among third standard students (67%). 90 percent of children had mild disease (lesion count < 250). School health team (RBSK) team identified less than 5 percent of total cases.

Conclusion:

Chickenpox among school children was highly contagious with attack rate of 66%. Male children were more affected. Most of the cases were mild. There is need to strengthen the surveillance for chickenpox using the school health (RBSK) team.





2.16. Investigation of measles outbreak in Doddagurki village, Kolar District, Karnataka, February 2016

Dr. Balasubramaniyan N, MPH 7th cohort

Introduction:

Measles contribute to 60% of vaccine preventable diseases. Measles is one of the leading causes of death among young children. Measles is highly contagious, caused by Paramyxovirus. Globally there were 114,900 measles deaths in 2014. About 314 deaths occur every day or 13 deaths every hour. From 2000 to 2014 worldwide, measles vaccination resulted in a 79% drop in measles deaths. In 2014, about 85% of the world's children received one dose of measles vaccine by their first birthday through routine health services – up from 73% in 2000. Most measles deaths (98%) occur in developing countries. Among those unvaccinated for measles, 6.4 million live in India. In India, National Technical Advisory Group on Immunization (NTAGI) recommended introducing MCV2 at 16-24 months of age in May 2010.Kolar District of Karnataka reported 15 cases of suspected measles on 18th February 2016 from Doddagurki village. Outbreak was investigated to confirm and describe the outbreak by time, place and person, to identify the risk factors associated with the outbreak, to estimate the vaccine coverage and vaccine effectiveness.

Methods:

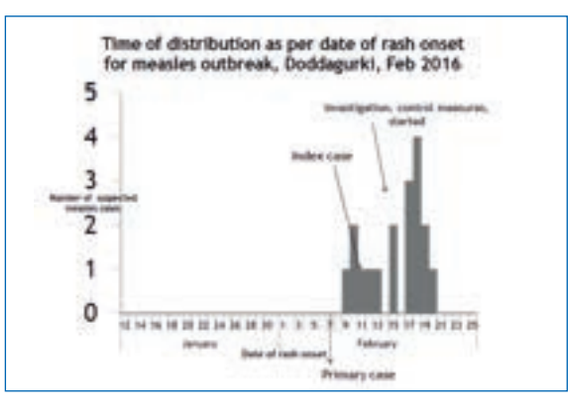
We defined a case as any resident of the village with fever and rashes between 23rd January and 3rd March 2016 in the age group less than 15 years. We did a retrospective cohort study from 4th to 5th March 2016. We did active surveillance. We interviewed the mothers with semi structured questionnaire to collect the data on socio demographic characteristics, vaccination status and contact history. We calculated the proportion of vaccinated children to estimate the vaccine coverage. We calculated the relative risk (RR) with 95% confidence interval to determine the risk factors. We collected 7 serum samples to test for measles specific IgM antibodies.

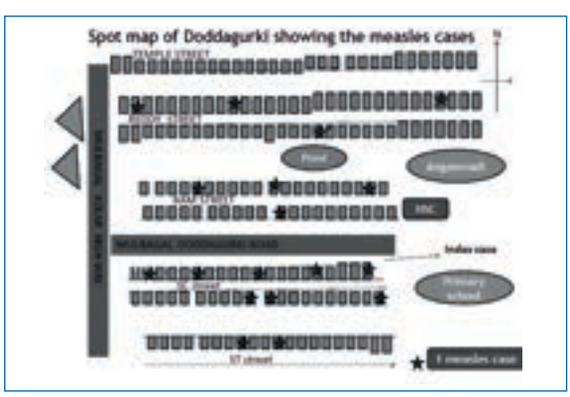
Results:

Totally 18 fever with rashes cases were identified. Outbreak started on 9th of February, peaked on 18th and the last case occurred on 19th of February. Median age was 9 years (Range 10 months to 15 years). Attack rate was highest (10.5%) among the age group 1 to 5 years (4/38). Attack rate among the females was 3.2% (12/376). Vaccination coverage was 74.4% (128/172). Risk of measles among unvaccinated children was 2.33 times more when compared to vaccinated children (95% CI as 0.18-1.02), RR is 0.43 and Vaccine Efficacy (VE) is 57%. Risk factors significantly associated with the measles outbreak are contact history (RR- 4.7 with CI as 1.7 – 12.6), children studying in Doddagurki Govt. school (RR-18.8 with CI as 2.5 - 138.5), children of SC & ST caste (RR 3.64 with CI as 1.5 – 8.6)

Conclusion:

Epidemiological and lab investigations proved there was measles outbreak in Doddagurki village between 9th and 19th February 2016. Incidence was high among females and in the age group 1 to 5 years. Both low vaccination coverage and low vaccine efficacy led to the outbreak. We recommend that vaccine coverage can be enhanced by the additional sessions of immunization session and strict supervision by the authorities. We also recommend to risk factors for the poor vaccine efficacy.





2.17. Investigation of an outbreak of viral hepatitis in Mandya District, Karnataka, 2015

Dr. Asha Frederick, MPH 7th cohort

Background:

Among viral hepatitis cases, 60% in India are due to Hepatitis E virus (HEV). Mandya district in Karnataka, India, reported 50 cases of Jaundice on 10 July 2015 from a factory. We investigated to describe the outbreak to identify risk factors and propose recommendations.

Methods:

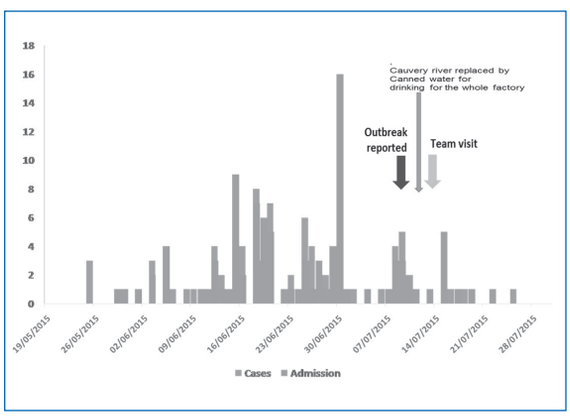
We analysed all reported jaundice cases in S.R.Patna. Standard definition of jaundice was used. We did retrospective cohort study between 15 and 30 July. We interviewed workers for socio-demographic characteristics, food sources and water sources. We calculated relative risk (RR) and 95% confidence interval (CI), attributable risk (AR) and population attributable risk (PAR). We collected 15 convalescent serum and 4 acute serum samples from case patients. We collected three water samples on each from canteen, overhead tank and river.

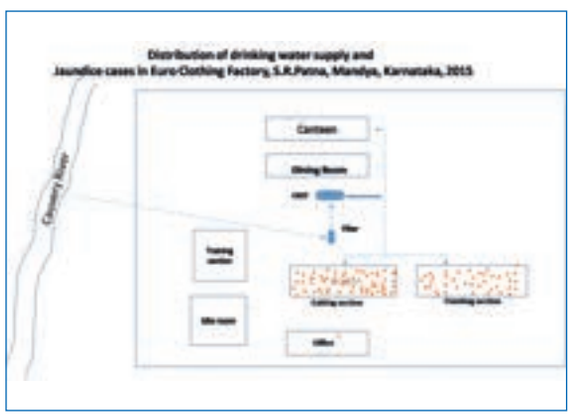
Results:

There were 12 cases from S.R. Patna between January and June 2015 and 132 cases from factory between 25 May and 28 July 2015. 73% of cases from factory were hospitalized with no deaths. Attack rate was 14% (132/950) and equal across gender (females 14% [114/812]) and males (13% [18/138]). Median age was 29 year. Using public water for drinking or cooking at home (RR=1.1, 95% CI=0.8-1.4) was not significant. Drinking water from factory tap (RR=1.7, 95% CI=1.2-2.5, AR=40%, PAR=30%), eating lunch daily (RR=2.1, 95% CI=1.4-3.1, AR=52%, PA=10%), or at least once from canteen in past three months (RR=2.4, 95% CI=1.7-3.3, AR=58%, PAR=32%) were risk factors. Eighteen serums were positive for HEV by IgM Elisa. River water was filtered in sand filter, stored in overhead tank (OHT) before supply. OHT water was never chlorinated. Factory tap water was used for cooking in canteen. Aqua guard filters in working areas filters were non-functional. All water samples were non-potable.

Conclusion:

This HEV outbreak in factory in Mandya district between May and July 2015 was associated with consumption of drinking water from factory and eating from factory canteen. We recommend providing safe water for drinking and cooking by changing sand in filters, chlorination and periodic water testing.





2.18. Outbreak Investigation of Mid-Day Meal Poisoning, Elayanarkuppam Village, Vanapuram PHC, Rishivandiyem Block, Kallakurichi Health Unit District, Tamil Nadu, India 2014

Dr. Boopesh N, MPH 7th cohort

Background:

Diarrhoea and food-borne outbreaks account for half of outbreaks in India but few investigations identify the source. On November 20th 2014 we received information from District health authorities regarding Students of Elayanarkuppam middle school, had compliant of abdominal pain, vomiting and giddiness where11children's admitted to nearby government facility after having noon-meal from the school prepared under mid-day meal scheme at Elayanarkuppam village, Vanapuram PHC, Rishivandiyem Block, Kallakurichi Health Unit District, Tamil Nadu, India 2014. We investigated to identify risk factors and provide recommendations.

Methods:

A retrospective cohort study was conducted. Data regarding the onset of symptoms, presenting features and history of food items consumed was collected. A detailed inspection of the mess for hygiene and sanitary status, cooking and storage procedure, and rodent nuisance was also carried out. We defined a case as acute onset of pain abdomen or giddiness/headache or vomiting with or without nausea, diarrhoea or fever among students of Elayanarkuppam middle school after having mid-day meal, Kallakurichi HUD, Tamil Nadu, India 2014. We assessed water sources and collected water samples, leftover food specimen collected and sent for lab investigation.

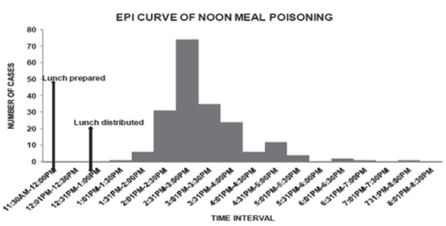
Results:

We interviewed 374/413 student (90% response rate) and identified 197 cases(attack rate=53%). Among 197 cases, 6% were admitted. Outbreak occurred between 1pm and 8pm on 20th November and peaked at around 2:30 pm. 81% had abdominal pain, 50% and 46% had giddiness/headache and vomiting respectively. Based on the population attributable risk PAR – 36% and relative risk (RR 4.8 95% CI 2.9-7.8) boiled egg served during mid-day meal on 20th November 2014 was incriminated as the food item responsible for outbreak.

Conclusion:

This food poisoning outbreak was significantly associated with mid-day meal consumption. We recommend personal cleanliness of the Noon Meal Organizer, cook and helpers should be ensured. General hygienic practice among students should be ensured.

Number Of Cases By Time Of Onset, Elayanarkuppam Middle School, Kallakurichi HUD, Tamil Nadu, 2014



Attack Rate Of Mid Day Meal Poisoning By Age And Gender

Age in years	No. of cases	Population	Attack rate/100 population
6	22	45	49
7	22	59	37
8	28	40	70
9	20	41	49
10	20	33	61
11	34	57	60
12	21	41	51
13 &14	30	58	52
Overall	197	374	53
Gender			
Male	91	181	50

2.19. Acute hepatitis E outbreak investigation, Sambalpur municipality, Odisha, 2014

Dr. Pradeep Aravindan Menon, MPH 6th cohort

Introduction:

Outbreak alert was prompted in Sambalpur municipality area, Odisha in December, 2014 due to clustering of jaundice cases and deaths. We investigated to confirm the outbreak, to identify the source of infection and to recommend control measures.

Methods:

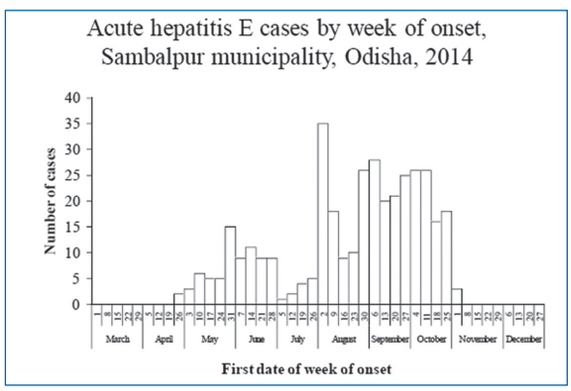
We interviewed district health officials and reviewed the data on incidence of jaundice and surveillance system. We interacted with clinicians and admitted patients. We sent blood samples for serological confirmation. We sent water samples to state public health laboratory, Bhubaneswar for coliform count and also to National Institute of Virology, Pune for molecular study. Door to door survey of jaundice patients by Anganwadi workers subsequently verified by medical team was done and a line list of cases was prepared. We plotted epidemic curve for time distribution, prepared incidence maps for place distribution in Epi info 3.5.4 version and calculated attack rates in different age groups. We estimated population by wards from census 2011 for denominator. We did environmental investigation and conducted an ecological study by source of water.

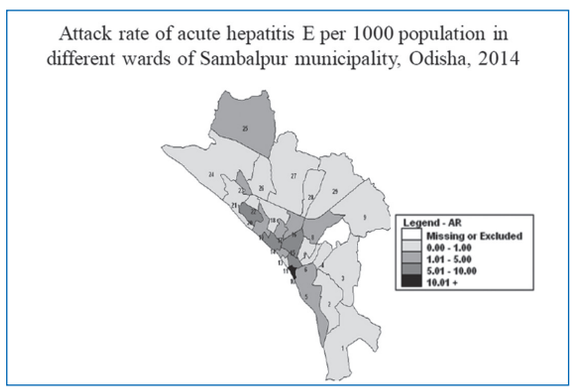
Result:

A total of 367 cases and six deaths were reported. Cases presented with acute jaundice, fever, vomiting and loss of appetite. All seven serum samples were positive for Hepatitis E IgM and coliform count was more than 10 per 100 ml of water in all five water samples. Presence of virus was not confirmed in molecular study. Epidemic curve showed start of outbreak in the month of May, peak in the month of August and continuing. Wards supplied by Modipada water system (10, 14, 12 and 15) were worst affected. Attack rate was highest in the age group of 15-44 years (2.4 per 1000 population) and more in males (2.4/1000) compared to females (1.3/1000). Attack rate in areas supplied by Modipada water system was 4.1 per 1000 compared to areas not supplied 1.1 per 1000 (p-value <0.01). There were numerous breakages in this old pipeline system.

Discussion:

Clinical profile, laboratory reports and distribution by age and gender confirmed this as a Hepatitis E outbreak. Contamination of water in Modipada water system might be the cause of it. We recommended immediate super-chlorination, distribution of halogen tablets and alternate water supply as immediate interventions and new pipelines as a long term measure.





2.20. An Outbreak of Rubella in village Jaulka of Washim district, Maharashtra, India, 2016

Dr. Dhande Sachin Murlidhar, MPH 6th cohort

Introduction:

We investigated the outbreak as a suspected outbreak of measles with the objectives of confirming diagnosis, estimating the magnitude of outbreak and formulating recommendations for control and prevention.

Methods:

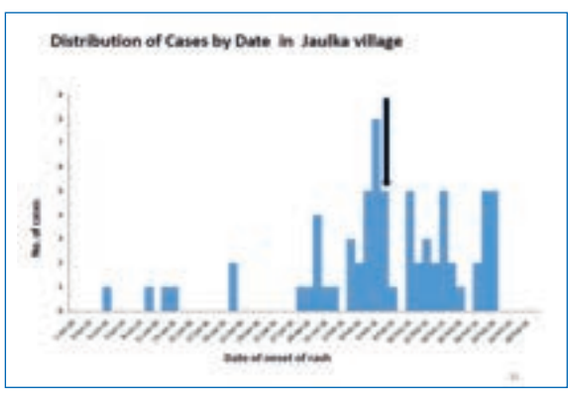
We defined a case of the rubella as occurrence of fever with rash in any resident of Jaulka village between 1stJanuary to 28th February 2016. We line listed the cases and collected information on age, sex, residence, date of onset, symptoms, signs, treatment history, vaccination status and pregnancy status. We described the outbreak by time, place and person characteristics. Sera of a sample of case patients were tested for IgM antibodies to measles and later rubella viruses.

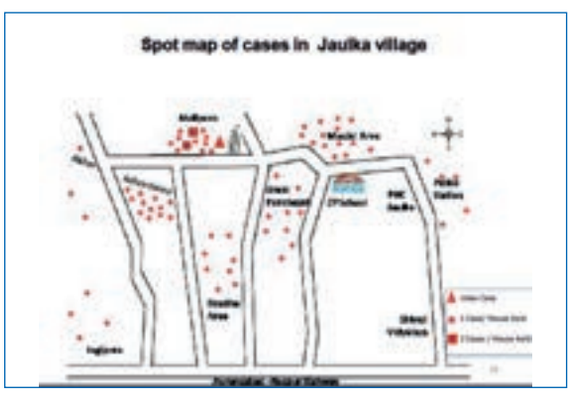
Results:

We identified 70 cases in village. The overall attack rate (AR) was 4.77%. Sex specific AR for males was 4.65% and females 4.9%. All case patients were less than 21 years of age and the attack rate was highest in the age group 5 to 16 years (median age 8.2 years). The index case was traced in Malipura and occurred on 6thFebruary 2016. No pregnant woman was found to be affected. The number of cases peaked on 8thFebruary and the last case was reported on 20thFebruary 2016. Of 70 case-patients, none of them were immunized against rubella. Out of ten blood samples tested, all tested negative for measles IgM antibodies but seven were positive for IgM antibodies to rubella.

Conclusion:

An outbreak of rubella was confirmed. We advised the local health authorities to provide MMR vaccination to the unexposed and energetic IEC activities in pregnant women and the susceptible.





3. HIV/AIDS

3.1. Multi-level Intervention among HIV-positive men who have sex with men (MSM) in India: A pilot study

Co-Principal Investigator (NIE)	Thilakavathi Subramanian
Co-Investigators (NIE)	Sanjay Mehendale
Collaborating Institute	Centre for Sexuality and Health Research and Policy [C-SHaRP] (NGO) and Yale University, US
Funding Agency	ICMR (extramural)
Start date	1stOctober 2014
Study Period	2 year
Status	2 years (October 1st, 2014 to September 30th, 2016)

Background :

HIV-positive MSM in India face numerous barriers that influence their preventive behavior and health care utilization. Individual risk factors include low HIV knowledge, lack of efficacy and skill to engage in protective behavior, lack of esteem and empowerment, and lack of coping with their HIV disease. Interpersonal risk factors include a lack of support, lack of communication about sex, and a lack of disclosure of HIV and sexual identity to partners and family. Lack of disclosure reduces available support systems that help MSM manage their HIV disease. It is important that HIV interventions incorporate building interpersonal skills and disclosure decision-making because: (1) HIV disclosure to male and female partners (including wife) is extremely difficult for MSM given cultural and community norms, and (2) lack of disclosure relates to increased HIV risk to partners and increased health risks to HIV-positive MSM due to fear of engaging support, treatment, and prevention services. Community risk factors include social isolation, stigma and discrimination, and negative experiences with the health care system. One study found that 89% of MSM reported experiences of sexual-identity stigma and HIV-related stigma, which relates to increased sexual risk, impaired coping, and decreased social support and life satisfaction. Furthermore, stigma occurred both outside and within the MSM community. These studies demonstrate that barriers to HIV prevention and treatment for MSM are pervasive, complex, and multi-level. This suggests that in order for interventions to successfully reduce HIV risk and improve care and treatment of HIV-positive MSM, they need to simultaneously address

Objectives:

To develop, implement, and assess an innovative multi-level intervention for HIV-positive MSM in India to promote their health, safer sex, and disclosure of HIV status, and to decrease the stigma/discrimination faced by them within the MSM community itself.

Project Progress:

In Year-1 (Oct 1, 2014 to September 30, 2015), we have successfully completed Cohort-1 individual-level counselling intervention in both study sites (Chennai and Kumbakonam). A total of 60 participants were enrolled in Cohort-1 (inclusive of both Intervention & Control arm). We have now stared analyzing Cohort-1 data (both qualitative and quantitative data).

In Year-2 (Oct 1, 2015 to September 30, 2016), we have implemented

Cohort-2 intervention comprising both individual-level counselling intervention (n = 59) & community-level intervention. Community-level intervention focused on activities that aimed at reducing the stigma and discrimination faced by HIV-positive MSM and to increase the acceptance of HIV-positive MSM within the MSM community. Since Oct 2015, we have completed :1) Two community consortium meetings to fine-tune/finalize activities for community-level intervention; 2) Enrolled 59 participants in the study and completed baseline and midline assessment; 3) Conducted community level intervention activities (DIC meetings, mega event, role models' talk) with collaborative CBO partners; prepared and delivered Tamil IEC posters and hand-outs; 4) Administered pre-and post-assessment of stigma and discrimination survey with 150 general MSM; 5) Administered/assessed process evaluation tools for the study.

The data analysis is in progress.

4.HEALTH SYSTEMS RESEARCH

4. HEALTH SYSTEMS RESEARCH

4.1. Process evaluation of Integrated Management of Neonatal and childhood Illnesses in India

Principal investigator	R. Ramakrishnan
Co-Investigators	Thilakavathi Subramanian and P. Ganeshkumar
Funding Agency	DHR
Date of Start	10th December 2014
Duration	1 Year + No cost extension for 1 year
Status	Ongoing

Background:

Integrated Management of Neonatal and Childhood Illnesses (IMNCI) program was started in India in 2003. It is the centerpiece of newborn and child health strategy in India under Reproductive Child Health II (RCH II) and National Rural health Mission. By August 2011, it had been implemented in 433 of India's 640 districts and more than 470000 workers had been trained. There have been major modifications in the original IMNCI program –facility based IMNCI and the IMNCI-Plus (Home-based neonatal care using ASHAs).

Given the background of IMNCI implementation, it was decided to carry out a process evaluation of the IMNCI in all the states of India with the following objectives.

Objectives:

1. To describe the implementation of IMNCI program in different Indian states.
2. To evaluate the implementation of IMNCI program at the district level in selected states in different geographic areas of India - in the areas of human resources, training, logistics, infrastructure, recording, reporting and supervision.
3. To evaluate the quality of IMNCI trained health workers (knowledge and skills) in case management and counseling and the quality of care provided by them at home and at health facility level
4. To evaluate the community perspective of the IMNCI program
5. To conduct research studies to test specific hypotheses generated by the evaluation.

Methods:

Study design:

Mixed methods design (Quantitative and Qualitative)

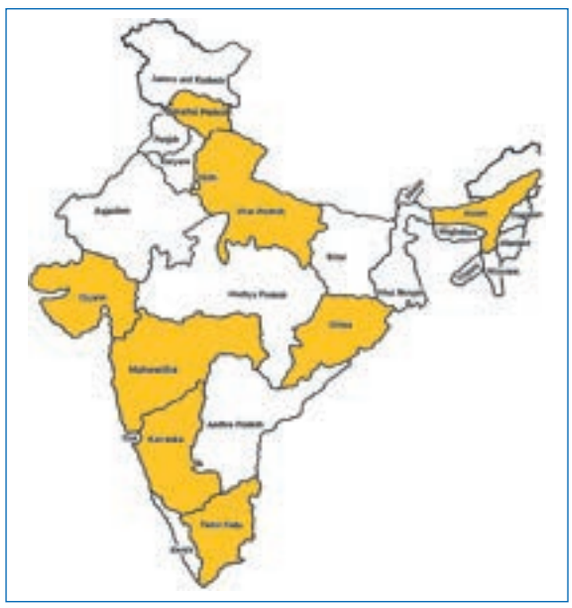
Study setting:

The evaluation was conducted in 8 states (Assam, Gujarat, Himachal Pradesh, Karnataka, Maharashtra, Odisha, Tamil Nadu & Uttar Pradesh) representing the North, South, East, West and Central part of India (Fig 1).

In each state, two districts were selected in consultation with the concerned state health directorate, NRHM project director and IMNCI nodal officer. These districts were in either consolidation phase or expansion phase with best and

innovative practices of IMNCI program. In each selected district, 4 blocks were randomly selected and in each block 4 primary health centers were randomly selected. Thus all together, the IMNCI implementation was assessed in 16 districts, 64 blocks & 256 PHCs of the country.

Figure - 1. IMNCI evaluation study sites



Data collection procedure:

We documented the IMNCI implementation by triangulating data from interviews with care provider, beneficiary and from secondary data analysis. Each methodology compensated and supported the other to achieve the proposed objectives of the study.

Secondary data analysis:

We collected information related to IMNCI implementation from the Government websites [HMIS, Program implementation plan (PIP) etc] from all the states & union territories of India. The study team also collected information regarding the IMNCI implementation of all districts of the selected states from the available records of IMNCI office of the State headquarters.

Quantitative data collection:

Data collected through structured questionnaire. At the state level, data collected from the state IMNCI nodal officer through state abstraction form. At the district level, data collected from the district IMNCI nodal officer through district abstraction form and facility survey of the district IMNCI training centers. In the district hospital, interviews were conducted with medical officers (preferably pediatricians) & staff nurses in-charge of treating under five children. Interviews of mothers of under five years children from exiting in the pediatrics OPD of the respective district hospital were also conducted. Facility survey of the district hospital was also carried out during the data collection.

At the block level hospital or CHC, interview of medical officers (preferably pediatrician if available) and staff nurses of the CHC, followed by exit interview of mothers of under five children attending the OPD of the CHC was conducted. Facility survey of the CHC was also carried out using the respective format. Similar data was collected from selected primary health centre (PHC).

At the community, mothers of neonate who has been recently visited by the ASHA were interviewed and knowledge assessment of mothers regarding under five child health were carried out in the community under the PHC catchment area.

Tablet PC based data collection through an android application was used for quantitative data. The tablet PCs were provided with a SIM card, hence the exact location, time and date of the interview were recorded.

Qualitative data collection:

At the state level, key informant interviews of the state IMNCI nodal officer, state ICDS officer and state NHM director were carried out using the respective guides. Qualitative data collection was conducted only in one district. At the district level, the respective district IMNCI officer and ICDS officer were interviewed. At the district hospital, CHCs, PHCs the respective medical officers and staff nurses were interviewed in-depth using the respective guides.

At the community level, in-depth interviews were conducted among Mothers of neonates who had died recently in a hospital, Mothers of under 5 year children who had died recently in a hospital, Mothers of neonates surviving after discharge from hospital and Mothers of under 5 year children surviving after discharge from hospital by the study team.

Focus group discussions were conducted among mothers of under five children, ASHAs and ANM/Anganwadi workers in each community under the PHC area.

All qualitative key informant interviews, in-depth interviews and FGDs were conducted using voice recorder. The recorded data was transcribed by the respective interviewer in the local language.

Summary on Progress (during the period of report):

A total of 9872 quantitative interviews were finalized after data cleaning. Dummy tables were prepared for analysis. Secondary data analysis related to IMNCI and Child health program was done with indicators. A total of 598 qualitative interviews were completed which includes in-depth interview and focus group discussions. Translation and transcription of the qualitative data is currently being done.

The data analysis is under progress.

4.2. Operational research on public health surveillance for mass gatherings in notified festivals in Tamil Nadu

Principal Investigator (NIE)	P. Manickam
Co-Investigators (NIE)	NIE: MV Murhekar, Ganeshkumar P, Upasana Sharma; DPHPM, Govt. of Tamil Nadu: K. Kolanda Swamy, GK Durairaj, Prem , B. Viduthalai Virumbi
Collaborating Institute/s	Directorate of Public Health and Preventive Medicine, Govt. of Tamil Nadu
Funding Agency	ICMR
Start date	Ongoing
Study Period	Ongoing

Background:

Mass gatherings involve major public health preparedness, alertness to plan and effectively manage the natural and manmade threats including terrorism attacks. Operational/implementation research such as establishment and assessment of effectiveness of enhanced surveillance during mass gatherings is an identified research priority. In India, National and State Governments use guidelines to prevent communicable diseases and other issues related to the nature of the gathering. Tamil Nadu Public Health Act, 1939 (updated, 1993) notifies 123 fairs and festivals. The Act mentions about detection and segregation of cases of infectious diseases and prevention of introduction and spread of such diseases. However, the Act neither provided details nor experience was available from a formal surveillance system in such settings. Our experience during one of the notified religious festivals in Tamil Nadu suggests that the Act was implemented as per guidelines. However, additional experience in a variety of challenging settings and situations would be useful in making the Act up-to-date. Hence, we propose to conduct this operational research.

Objectives:

(1). Document effectiveness of syndromic surveillance system for a limited number of conditions that could be facilitated by the mass gathering and/ or of outbreak potential (2).update the guidelines for mass gatherings. The operational research will be conducted in few of the notified festivals. We will collect primary from (1). Assessment of public health measures at the festival site, (2). Establishment and documentation of syndromic surveillance, (3). Abstraction of data from emergency transport services, (4). Interviews of stakeholders involved in the event.

Methods:

We used a checklist to assess the field sites for adequacy of arrangements. We established surveillance in the health outposts/clinics in and around the festival area and out-patient clinics within the nearby health facilities. We used case definitions from the National Integrated Diseases Surveillance Programme (IDSP). We developed and implemented real-time data capture, analysis and response system. We interviewed key informants from the population, health system staff and key personnel from important sectors involved in the mass gathering arrangements. We collected secondary data through review of documents, reports and relevant guidelines on mass gatherings.

Results:

Godavari Pushkarams 2015, Yanam Region

Godavari Pushkarams festival happens every 12 years. During 14-25 July 2015, it was celebrated at Yanam, an administrative unit of Puducherry. An estimated 1,00,000 pilgrims were to have bath in designated bathing 'ghats' in Godavari river. In the absence of prior preparedness plan, we facilitated preparation, implementation and monitoring of plan including establishment of syndromic surveillance system. We collaborated with Pushkarams organizing committee to develop preparedness plan based on review of records and discussions with stakeholders. We trained health staff in conducting camps,

case detection and reporting, field workers in monitoring of water testing, volunteers in mapping and health managers in analysis and feedback. We monitored the implementation through check-lists and direct observations. Preparedness plan facilitated mobilization of drugs and purchase of choloroscopes for water testing. Yanam authorities implemented general as well as food-specific safety, hygiene and sanitation measures, transportation and medical camps. An estimated 10,00,000 congregated. Interviewed pilgrims (n=120) were mostly satisfactory (98-100%) except accommodation (77%) regarding arrangements. Surveillance through medical camps captured 4542 syndromic conditions. Outbreak potential conditions were less than 2% (Fig. 1). Generally, health staff (n=25) were comfortable in surveillance operations, however, 33% had difficulties with reporting formats. Development of public health preparedness, surveillance and response plan facilitated satisfactory implementation during the festival. On-site surveillance detected syndromes of outbreak potential.

Training of health staff on case definitions for identification, registration, reporting

Total of 4542 walk-ins at onsite medical camp

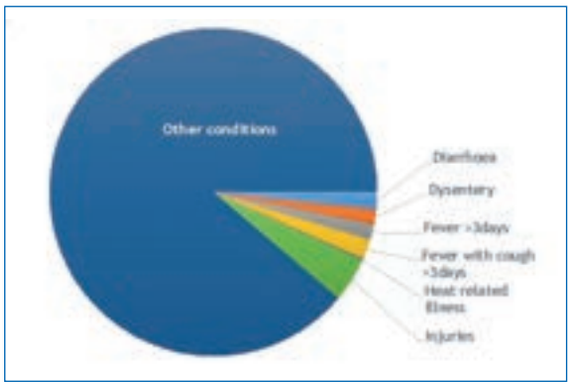


Fig. 1

NIE team training the nurses for syndromic surveillance, Yanam, Puducherry, 2015

Karthigai Maha Deepam, Tiruvannamalai, Tamil Nadu [November 2015]

We participated in the festival and offered inputs to the District team. We observed that most of our recommendations during the feasibility study in 2014 were implemented. However, we observed the need for the following: (1) strengthen rapid assessment through check list (2) improve hygiene/safety of food supplied by vendors (3) provision of additional toilets (4) implement vector control jointly with municipality (5) improve medical camps organization, logistics and reporting system (6) strengthen rapid response teams registration (7) establish co-ordination mechanisms with police department to improve crowd management, water supply logistics and sanitation measures. We could not do post-festival assessments since our teams were to be back in Chennai for public health surveillance/response activities during rains/deluge.

4.3. Tamil Nadu Directorate of Public Health and Preventive Medicine (DPHPM)-NIE 'Health System Research Study Programme (HSRSP)'

Principal Investigator (NIE)	10 projects have individual PIs
Co-Investigators (NIE)	MAE/MPH graduates and staff from Tamil Nadu Health System, NIE faculty, Subject matter experts
Collaborating Institute/s	Directorate of Public Health and Preventive Medicine, Govt. of Tamil Nadu
Funding Agency	National Health Mission, Tamil Nadu
Start date	March 2016
Study Period	Ongoing

As part of the ongoing collaboration between NIE and DPHPM of Govt. of Tamil Nadu, NIE proposed a joint health system research through public health professionals under the DPHPM. In this regard, the Tamil Nadu State National Health Mission (NHM) sanctioned a scheme called 'Health System Research Study Programme (HSRSP)' to be carried out jointly by DPHPM-NIE. The overall objective of the scheme is to conduct short-term field-based health system research projects by a team comprising of serving public health officer(s), current and ICMRSPH graduate from Tamil Nadu public health cadre along with NIE team. During a joint meeting on 30th March 2016, the following priority topics were identified and teams were formed. Technical Review Committees and mechanisms have been set up.

- Prevalence of leprosy, Tirunelveli
- Detection and management of Pregnancy induced hypertension (PIH): Research cum intervention project
- Prevalence of anemia among children (1- 17 years) including Soil Transmitted Helminths (STH)
- Household level water storage practices in the context of vector-borne diseases
- Survey of cause of death by verbal autopsy, Tiruvallur district
- Review of deaths attributed to Rabies, Tamil Nadu
- Setting up of registry for snakebites, Tamil Nadu
- Operational feasibility of implementing NCD services through mobile medical unit
- Geographical distribution of unfavourable outcomes in RNTCP, Tamil Nadu
- Review of Neonatal and Maternal deaths policies/programmes

4.3.1. Surveillance and public health response in the aftermath of monsoon flooding in Chennai, South India, December 2015

Background:

During the first week of December 2015, Chennai city (Census 2011: 72 million population) and adjoining suburban areas of Tamil Nadu, South India experienced flooding due to heavy rainfall. Power failure and network connectivity constrained surveillance cycle. The Tamil Nadu Directorate of Public Health and Preventive Medicine established emergency surveillance to generate valid alerts for public health response. National Institute of Epidemiology contributed to the establishment of surveillance and alert generation and public health aspects monitoring

Methods:

The Tamil Nadu Directorate of Public Health and Preventive Medicine established surveillance among in & out patients in six major admitting health facilities and relief medical camps for acute diarrheal disease (ADD) and acute febrile illness (AFI) from 5th December. We set up a 24x7 control room to collate and analyse the real-time data transmitted through fastest route of communication available like paper based reports, short-messaging services, voice call, Whatsapp, email and maps. We surveyed media reports for significant health events, implemented vector surveillance and monitored residual chlorine in potable water. State specific Daily Fever Surveillance System (DFSS) reported line list of provisional and laboratory confirmed fever cases to control room. We generated alerts using open source applications based on triangulation of location from relied medical camp reports, health facility based surveillance, media surveillance, vector surveillance, water chlorination monitoring, DFSS with priority given to laboratory confirmation.

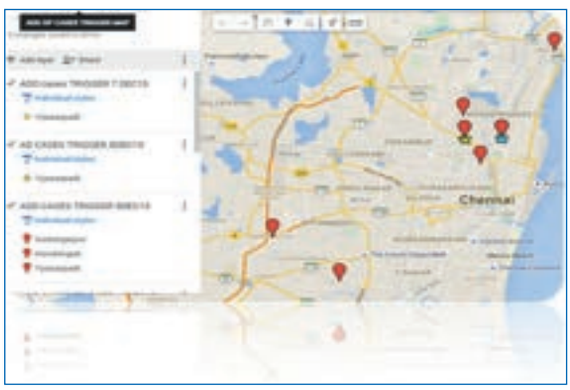
Results:

Totally 1613 ADD and 6027 AFI were reported. We identified 388 locations as ADD alerts and 179 locations as AFI alerts until 31st December. We identified six high risk localities required additional response. We shared alerts through fastest route of communication with local officials for preventive/control measures. No outbreaks were reported in surveillance system and media.

Conclusions:

Using available communication means made 24x7 control room functional. Triangulation of location data from all available sources identified alerts on population risk of disease for providing focused implementation of public health measures.

Secretary-DHR and DG-ICMR reviewing the functioning of DPHPM's 24x7 control room



Mapping of cluster of hospitalized patients

4.4. Literacy Immunization and health indicators of Chennai City.

Principal Investigator	Vasna Joshua
Co-Investigators	S Venkatasubramanian
Funding Agency	Intramural
Start date	April 2015
Study Period	One year

4.4.1. An index and a spatial portray of illiteracy and its covariates of Chennai city

Objective:

To develop an index and a smoothed map of Kriging, simultaneously considering several covariates of illiteracy for Chennai city.

Materials:

Zone wise illiteracy and its covariates for the year 2011 from Census of India, Corporation of Chennai and published reports were used.

Methods:

Data on illiteracy and its covariates for ten Zones of Chennai city were used for the analysis. The covariates were based on demography (population, average family size, proportion of slum population, proportion of illiterates, proportion of female illiteracy, proportion of births, proportion of person unemployed, proportion of tribal population) and variable explicative additional like average number of children per government school, average number of persons using water from public water facility, average no. of persons per public convenience. An index for each zone was obtained using statistical technique of factor analysis. These indices for each zone measure the relative difference between the illiteracy levels. A smoothened map of illiteracy covariates was done using Kriging technique (Fig 1).

Results:

Four zones had an index of above 50 (higher than average) which shows greater care should be emphasized in these zones to bring down illiteracy level. The smoothened map obtained using Kriging portrays the northern part of Chennai as higher risk of illiteracy.

Conclusion:

The map with the index could help the health managers, social scientists and policy makers to identify regions that require greater care to bring down the illiteracy level to a greater extent.

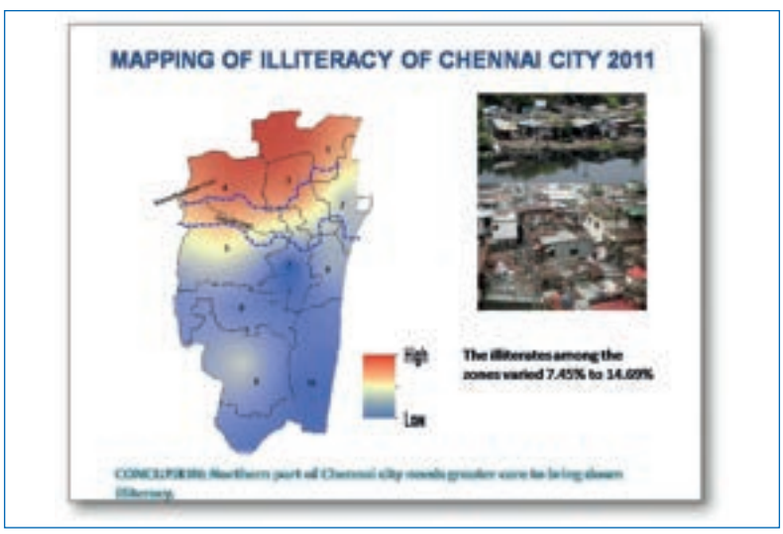


Figure - 1:

4.4.2. Determinants associated with infant immunization in Chennai City, India.

Background:

Inadequate and incomplete immunization of Infants is one of the main public health problems in India. It increases preventable childhood diseases. As a key element of the national child survival strategy, India's Universal Immunization Programme was launched in 1985-86. To Strengthen and maintain robust surveillance system for Vaccine Preventable Diseases, Pregnancy Infant Cohort Monitoring & Evaluation (PICME) was launched. The study objective was i) to identify the determinants associated with the complete immunization of infants for Chennai City for the year 2012 and 2013 using binary logistic regression model. ii) to produce a smoothened surface map of Chennai City with predicted values of Complete immunization coverage of Chennai city for both years respectively using PICME data.

Methods:

Binary logistic regression analysis was used to find the significant predictors of the completely immunized infants (CII). Covariates namely sex of the baby, birth weight of the baby, gravida of the mother, age of the mother and education of the mother were included in the binary logistic regression model. The predicted values of completely immunized infants of Chennai City were aggregated to simple averages at PHC level and a smoothened map was obtained.

Results:

In the year 2012, 77.4% of the children were completely immunized with correct time intervals where as it was 74.5% in the year 2013. The binary logistic regression model assessed birth weight of the baby and education of the mother [(high school or above) as significant predictors for complete immunization of the infant. The map shows the regional variation of Chennai City with completely immunized infants monitored in the PICME programme. The northern part of Chennai City especially Zones 1, 2, 3 and 4 shows higher level of incomplete vaccination coverage in both the years.

Conclusion:

Twenty two percent in 2012 and 24% in 2013 attempted for complete vaccination dosages but with incorrect time schedule. If the attempt was made correctly then the complete vaccination coverage for Chennai City would be 98% to 99%. Future focus should be to i) educate the mother and the health workers with the importance of correct time intervals/schedule of vaccination dosages ii) importance of complete vaccination even for low birth weight babies who are at higher risk of morbidity and iii) strategies to eliminate gender discrimination for complete vaccination and negligence of higher order of birth for the healthy survival of the infants from vaccine preventable diseases iv) northern part of Chennai city needs priority care to move one step closer to cent percent complete immunization status of infants.

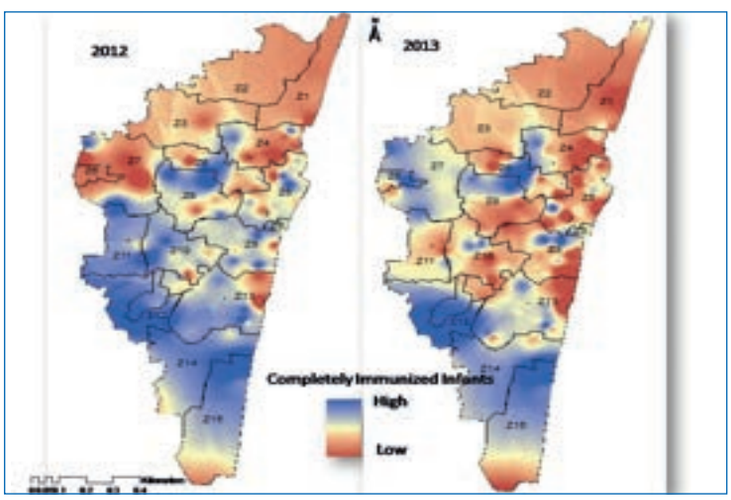


Figure - 2: Spatial mapping of predicted values of Completely Immunized Infants of Chennai City.

5.0 TRIBAL HEALTH RESEARCH

5.0 TRIBAL HEALTH RESEARCH

5.1 Tribal Health Research Unit (THRU): Health-needs assessment of selected hill tribes (Palliyar and Muthuvan) in Western Ghats of Tamil Nadu and to estimate the disease burden amongst them.

Co-Principal Investigator (NIE)	Dr. Yuvaraj, Scientist F, Nodal Officer, Health System Research, NIE (ICMR)
Co-Investigators (NIE)	Dr. Prabhdeep Kaur, Scientist D
Collaborating Institute	-Nil-
Funding Agency	ICMR
Start date	09/11/2015
Study Period	5 years
Status	Ongoing

Background :

The Palliyar tribes roughly comprise about 1% of total ST population in Tamil Nadu. This tribe has poor socio economic status, dwell mostly in forests as small groups and forage the forest for food. They collect forest produce such as tubers, honey and herbs, but with the declaration of wild life reserves they are relocated in the foot hills leading to increased interaction of the people living in the plains. They have now begun to work in coffee plantations in the hill areas, also help the forest departments as watch and ward staff. These relocated tribals are slowly losing the knowledge of traditional medicine and have started to rely on the health system for their health needs.

Malayali's are the biggest tribe with 3,57,980 population and Kochu velan had the least with only Seven people. The Irula's with 1,89,661 constitute the biggest PVTG group and the least is Kota tribe with only 308 people 2. The Palliyar's Tribe are densely populated in Dindigul district about 4,368 (2011 Census), and this constitutes nearly half of their total population. They are also located in other districts like Virdhunagar, Madurai, Theni, Erode and Thirunelveli. We condected a study among Periyar trives with following objectives.

Objectives :

a) To assess the Health and Needs Status among the Tribal Population.

b) To describe the disease Burden in the study population.

c) To describe the Socio Cultural Practices of the study population.

Methods :

This study followed a Mixed Study Design (Preliminary FGD and IDI with a Cross-Sectional survey) The team approached the revenue department and tribal welfare department in Dindigul District for the list of villages in the district and were informed verbally that officially there were no Palliyar tribals in Dindigul District, hence no list is available. The local non-governmental organizations helped the team in locating the tribal's in parts of Sirumalai, Kodaikanal and Palani hills, of Dindigul District and an Anthropologist from the

Department of Anthropology, University of Madras helped to confirm that they were Palliyars based on anthropological tools. Thus a total of 17 clusters were listed and enumerated. In the first phase of the study, we conducted Focus Group Discussions (FGD) and In-depth interviews (IDI) in the seventeen clusters/ villages/ settlements. Also, a Cross-Sectional survey was conducted in the Dindigul district to enumerate the Palliyar's. We identified one cluster and using the information collected and with the help of the one of the members as a guide was able to identify another 16 clusters. Qualitative data were collected using FGD and IDI guides in the study population. Also, information regarding anthropometry which included height, weight, and skin fold and biceps thickness for children, and for the adults, Blood Pressure, and Sugar, was done for those who were willing. Prior to undertaking this study, we met the elders of the community, explained them the purpose, and with their concurrence conducted the study. Again the consent of the individuals were obtained verbally and written consent from those who were willing to sign and oral from those who refused to sign the consent forms but were willing to participate.

Results :

Total of 17 clusters were listed and enumerated. In the first phase of the study; we conducted Focus Group Discussions (FGD) and In-depth interviews (IDI) in these seventeen clusters. The Qualitative data (19 IDI and 15 FGD) were collected and they are still under the process of translation, data cleaning for qualitative analysis. b) The quantitative data collected to ascertain the disease burden, education and nutritional status has been given below.

Table - 1: Age structure of the enumerated population

Age Group	Male	(%)	Female	(%)	Total	(%)
0-1	6	1.0	8	1.3	14	1.3
1- 5	64	11.5	53	9.5	104	9.5
6-12	87	15.6	76	13.7	163	14.9
13-17	53	9.5	48	8.6	101	9.2
18-24	64	11.4	93	16.9	157	14.3
25- 59	234	42.3	247	45.1	481	43.8
>60	49	8.7	28	4.9	77	7
Total	552	50.3	545	49.7	1097	100

In this visit, the team was able to enumerate about 1,097 Palliyar's (552 males and 545 females). Among the population distribution in the 17 villages, Koran kombu was the biggest village (221) and Thata kuzhi Kaadu has the least population (7). The minimum and maximum age recorded was 3 months and 98 years. We observed that there were few (14) children less than one years of age, and very few old aged people and there were more males (49) than females (28).

Table - 2 : Education status of Children and Adult Palliyar's

Age group	Un Educated			Primary School			Middle school			Secondary School			Higher Secondary			Graduates			Total
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
6-12	14	9	23	60	50	110	13	17	30	0	0	0	0	0	0	0	0	0	163
13-17	11	2	13	11	6	17	21	23	44	6	10	16	4	7	11	0	0	0	101
Total	25	11	36	71	56	127	34	40	74	6	10	16	4	7	11	0	0	0	264
18-24	24	43	67	14	14	28	17	15	32	9	12	21	0	6	6	0	3	3	157
25-45	151	172	323	16	15	31	19	15	34	2	4	6	2	2	4	0	0	0	398
46-59	44	39	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83
>60	48	28	76	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	77
Total	267	282	549	31	29	60	36	30	66	11	16	27	2	8	10	0	3	3	715

Nearly 77% of the Palliyar's have not received any education in the study area (table 2).

Anthropometric measurements like height, weight, and Blood Pressure and Random Blood Glucose was done for the willing subjects. About 287 individual who were willing to participate in this study. About 75% of these individuals were adults (table 3).

Table - 3 : Distribution of the study Population for whom Anthropometry data is collected

Age Groups	Gender		Total
	Male	Female	
<5	15	19	34
6- 12	15	10	25
13-17	8	3	11
18-24	17	20	37
25-45	55	64	119
46-59	20	12	32
>60	17	12	29
Total	147	140	287

The Nutrition status was measured among children aged less than 5 years, the nutritional assessment was calculated using WHO's nutritional measurement tool. For children aged between 5 -18 years the nutrition was measured using Indian Academy of Pediatrics (IAP) revised guidelines for BMI. Palliyar adults were measured for the BMI status and compared with WHO standard guideline values.

Nearly 31% (11 children) of the 34 children in the age class of 0-5 years were suffering from severe malnutrition. It was higher in boys (6/15). (Table 4).

Table - 4: Nutrition Status of Children (0-5 years)

Nutrition(0-3 years)		Male (6)	Females(11)	Total (17)
* ICDS Growth Chart (Underweight)				
	Normal	1(16.7%)	3 (27.3%)	4 (23.5%)
	Moderate	4(66.6%)	8 (72.7%)	12(70.6%)
	Severe	1(16.7%)	0 (0%)	1 (5.9%)
Nutrition (4 and 5 years)		Male (9)	Females (8)	Total (17)
WHO Nutrition (Gomez)	Normal	3(33.3%)	6(75%)	9(53%)
	Moderate	1(11.1%)	1(12.5%)	2(11.7%)
	Severe	5(55.6%)	1(12.5%)	6(35.3%)

Table - 5: Nutritional Status of Palliyar's (adults) in Dindigul district using BMI

Age Group	Under weight		Normal Range		Over weight		Obese		Total
	Male	Female	Male	Female	Male	Female	Male	Female	
6-12	1	2	13	8	1	0	-	-	25
13-17	1	0	7	3	0	0	-	-	11
Total	2	2	20	11	1	0	-	-	36
18-24	8	11	8	6	1	2	0	1	37
25-45	23	41	30	20	2	2	0	1	119
46-59	9	8	9	4	0	0	2	0	32
>60	8	4	8	7	2	0	0	0	29
Total	48	64	55	37	4	4	1	2	217

In children between 6 and 17 years 4/36 children were underweight and 1 boy was over-weight. Nearly 31/36 children had normal growth. Nearly 52% (112/217) of the adults were under weight and 7% more females were suffering malnutrition more than that of the males (Table 5).

Table - 6.a : JNC – 7 Classification of Hypertension (Systole) among Palliyars

Age Group	Hypo tension		Normal		Pre-HTN		Stage1-HTN		Stage2-HTN		Total
	M	F	M	F	M	F	M	F	M	F	
18-24	0	2	7	7	9	10	1	1	0	0	37
25-45	2	1	25	35	22	18	6	7	0	3	119
46-59	0	1	6	4	7	3	5	3	2	1	156
>60	1	0	0	1	9	4	5	4	2	3	29
Total	3	4	38	47	47	35	17	15	4	7	217

Blood Pressure was measured According to JNC – 7 classifications for hypertension. The systole and diastole measurements for males were 17% and 19% respectively and diagnosed as Hypertensive; the males who were diagnosed as hypotensive were 3% and 10% for Systole and Diastole (Table 6.a and 6.b). Among females, 20.3% and 16.7% of systole and diastole were found diagnosed as Hypertension and 12% of females were found hypotensive diastole.

Table - 6.b: JNC – 7 Classification of Hypertension (Diastole) among Palliyars

Age Group	Hypo tension		Normal		Pre-HTN		Stage1-HTN		Stage2-HTN		Total
	M	F	M	F	M	F	M	F	M	F	
18-24	1	3	13	8	2	9	1	0	0	0	37
25-45	7	7	30	38	13	10	5	5	0	4	119
46-59	1	3	10	5	3	2	3	2	3	0	156
>60	1	0	6	2	3	3	4	4	3	3	29
Total	10	13	59	53	21	24	13	11	6	7	217

Table -7: Random Blood Glucose level of Palliyar's

Age Group (Years)	Low Sugar (<70)			Normal (70-140)			Pre-Diabetes (140-200)			Diabetes(>200)			Total
	M	F	T	M	F	T	M	F	T	M	F	T	
18-24	1	0	1	15	19	34	1	1	2	0	0	0	37
25-45	1	0	1	50	58	108	4	6	10	0	0	0	119
46-59	0	0	0	15	11	26	5	1	6	0	0	0	32
>60	0	0	0	15	8	23	2	3	4	0	1	1	28
Total	2	0	2(0.9%)	95	96	191(88.1%)	12	11	23(10.6%)	0	1	1(0.4%)	217

Nearly 11% of the adults Palliyar's were in pre-diabetic stage and the distribution among both males and females were almost equal (Table 7). However it should be noted that this stage of diabetes was higher in the working age classes between 25 and 59 years of age.

Conclusions:

This is the preliminary report from the qualitative data that was collected. The full picture of the health needs will be available when the qualitative data is analyzed along with the quantitative data for deriving conclusions.

5.2. Health systems preparedness for interventions for diabetes, hypertension, chronic respiratory diseases, cardiovascular disease and cancers and deaths due to non-communicable diseases among the tribal population in India.

Principal investigator/Co-PI:	Dr Sanjay Mehendale[1], Dr Prabhdeep Kaur[1], Dr PK Mohapatra[2]. [1]National Institute of Epidemiology, Chennai [2]Regional Medical Research Center, Dibrugarh
Site Investigators	ICMR Institutes: Dr Vijayachari, RMRC, Port Blair; Dr S Sahu, VCRC Field station, Koraput Co investigators from state governments : Dr Karma Jigme Tobgay, Government of Sikkim; Dr PKB Patnaik, Government of Odisha; Dr Zorinsangi, Government of Mizoram; Dr Gautam Majumdar, Government of Tripura; Dr Bibha Marak, Government of Meghalaya; Dr Rakesh Bhardwaj, Government of Himachal Pradesh.
Date of start:	1st December, 2013
Current status:	Phase II ongoing

Background and objectives:

Non-communicable diseases (NCDs) are the leading cause of the death globally and in India. NCD pose a huge challenge for health systems. Tribal population in India are going through the transition leading to increasing burden of non-communicable disease (NCD) risk factors that may increase the burden of NCD morbidity and mortality. Current study has two components. The component aims to understand the level of health systems preparedness in to manage NCD, challenges faced by patients to seek care and blood pressure /glycemic control. Second component is to describe cause of death among tribal populations and estimate the proportion of deaths due to non-communicable diseases. Study will be conducted in one district each in 12 states that have districts with >50% tribal population. These include eight north eastern states, Madhya Pradesh, Himachal Pradesh, Odisha and Andaman and Nicobar. Cause of death survey is conducted at the community level and health facility, provider and patient survey is conducted in primary and secondary care facilities. The study will provide baseline information that will be useful to plan NCD programs.

Activities:

The study was initiated in Koraput, Odisha in March, 2014, Sikkim in May, 2014, Lunglei, Mizoram in April, 2015, Dhalai, Tripura in Sep, 2015, and Nicobar in August, 2015. The data collection has been completed in Koraput, Odhisha on 30th September, 2014, Sikkim on 30th October, 2015, Lunglei, Mizoram on 15th September, 2015, Dhalai, Tripura on 16th February, 2016 and Nicobar on 16th January, 2016. The study is ongoing in Kinnaur, Himachal Pradesh and East Garo Hills, Meghalaya. The findings from Koraput, Odisha and Sikkim were given in the previous reports. Key findings from Lunglei, Mizoram and Nicobar, Andaman and Nicobar are summarized here.

Key findings of patient exit survey: Lunglei, Mizoram and Nicobar, Andamans and Nicobar:

We surveyed 227 patients in Lunglei in Mizoram and 192 patients in Nicobar. More than 70% patients were above 45 years of age and 74%-100% belonged to ST. Only one fourth of the hypertensive patients had blood pressure under control in both the settings (Mizoram: 34% and Nicobar: 27%). Overall, only 33-48% of the diabetics in Mizoram and Nicobar had glycemic control. More than half of the hypertensive patients in Mizoram and Nicobar took regular treatment in the previous one month (Table 1). Most of the patients reported that anti hypertensive and anti diabetic drugs were either never available or sometimes available in the public sector facilities in Mizoram. Drugs were mostly available in the public sector facilities in Nicobar. All patients with hypertension and diabetes incurred out of pocket expenditure

(OOPE) on drugs in Lunglei, Mizoram. Only 4% of the patients with hypertension and 25% of the patients with diabetes incurred OOPE in Nicobar, Andaman and Nicobar. Median one time expenditure on purchasing tablets from outside ranged from Rs.300- to Rs.600/- in Mizoram and 195/- to Rs.257/- in Nicobar for various NCDs.

Table - 1: Patient survey Mizoram and Nicobar, 2014 -15

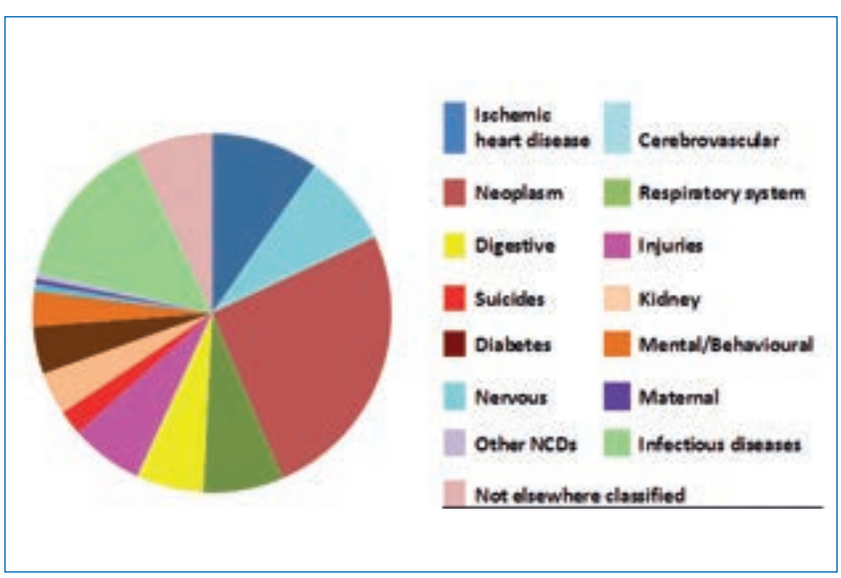
	Mizoram			Nicobar		
	N	n	%	N	n	%
Median time take to reach hospital	227	226	20 min	192	192	15min
Hypertension control	128	43	34	165	45	27
Regular treatment taken for hypertension in the previous one month	129	73	57	165	93	56
Glycemic control	66	22	33	44	21	48
Regular treatment taken for diabetes in the previous one month	134	89	66	49	22	45

Key findings of cause of death survey: Mizoram and Nicobar, Andaman Lunglei district, Mizoram:

We conducted a community based cross sectional survey using verbal autopsy for 443 deaths that occurred in previous one year among adults more than fifteen years of age. (fig 1) Among the deceased, 43% of males and 61% females were above 60 years of age. Nearly one fifth (20%) never attended school, 39% being skilled or unskilled manual labourers. Most of the deceased (84%) lived in kuccha houses while 28% were BPL card holders. Majority were Christians belonging to scheduled tribes (99%). Home (52%) was the most common place of death followed by district hospital (20%). Almost 62% were smoker while 30% were alcohol users during the five year period prior to death. Hypertension (31%) was the most common pre existing disease followed by neoplasm (18%).

Overall, NCD accounted for most of the deaths (68%) followed by other causes (16%) and infectious diseases (15%). Neoplasm (26%) followed by cardiovascular diseases (18%) and respiratory diseases (7%) were the leading cause of death due to NCDs. Digestive system neoplasm was the most common cause among neoplasm deaths. Proportion of deaths due to circulatory system and neoplasm increased with age. Most of the infectious disease (14%) deaths were due to malaria (5%).

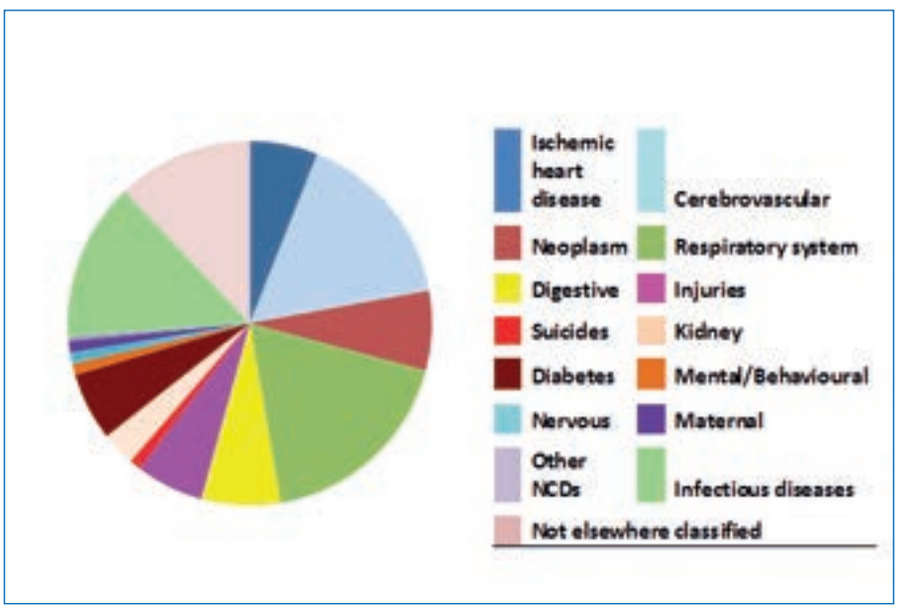
Figure -1: Cause of death, Lunglei, Mizoram, 2015



Nicobar district, Andaman and Nicobar:

We conducted verbal autopsy for 262 deaths in Nicobar and assigned the cause of death (fig 2). Overall, 56% of the deceased were above 60 years of age. Nearly half of the deceased (54%) never attended the school. Majority of the deceased (97%) belonged to scheduled tribe (ST), among ST, all belonged to Nicobarese tribes. BPL card holders were 39% and home (61%) was the most common place of death for the deceased. Almost half (52%) of the deceased individuals were reported to be smokers while 64% were alcohol users. Non communicable diseases namely hypertension (42%), chronic respiratory disease (22%), diabetes and tuberculosis (11%) were the major pre-existing diseases among the deceased. District hospital (55%) was the most common place where the deceased sought treatment before death followed by PHC/CHC/rural hospital (19%).Overall, NCD were the leading cause of death (65%) followed by other causes (20%) and infectious diseases (15%). Circulatory system diseases were the cause of death for nearly one fourth (22%) of the deceased individuals while respiratory system diseases accounted for 18% of deaths. Among the infectious diseases, 10% of the deaths were due to tuberculosis. Neoplasm and alcohol liver diseases were responsible for 7% of the deaths respectively. Overall, 6% of deaths were caused by diabetes and external causes mainly injuries or accidents. Kidney diseases accounted for 3% of deaths. Malaria accounted for only 2% of deaths.

Figure - 2: Cause of death, Nicobar, Andaman & Nicobar, 2015 (N=262)



6.1 Health Impact of Quarry Works in Suburban areas of Chennai

Co-Principal Investigator (NIE)	A. Elangovan
Co-Investigators (NIE)	J. Yuvraj, R. Prabhu,
Collaborating Institute	NIRT, Satyabama University
Funding Agency	Intramural
Start date	2014
Study Period	1 ½ years
Status	Completed

Objective:

The main objective of the study is to measure the health impact of quarry works among the residents living within 5 KM radius form the quarries and to measure the related environmental parameters in the study area.

Results:

The study was initiated during February 2014.A total of 2306 subjects were covered in the study of which 1975 were from community residing nearby the quarries and 331 workers in the various quarries. X-ray was done for all the participants where as the sputum collected for the symptomatic cases and the cases with x-ray positive. Spirometry test was done only for randomly selected participants from each grid. Data entry and verification are completed and some important tables were prepared and produced below.

Quarry site in Chennai

X-ray unit functioning at Field site

Table.1. Basic characteristics of the study population

Group	Male Mean + sd	Female Mean +sd	Total Mean +sd
Community			
N	905	1070	1975
Age (years)	42.5+15.71	41.4+14.89	41.9+15.28
BMI	23.76+4.17	25.49+4.93	24.7+4.68
Quarry workers			
N	253	78	331
Age (years)	37.64+13.23	41.5+12.65	38.6+13.17
BMI	21.78+3.94	22.16+4.11	21.87+3.98

The mean BMI of female was significantly (P<0.05) higher when compared to male in community whereas in quarry the mean BMI is almost similar between the gender.

Table.2. Distribution of abnormalities in community and quarry by gender

Group	Male	Female	Total	p-value
Community				
Abnormalities (by x-ray)	5.4 %	3.7 %	4.5%	0.093
Abnormalities (by symptoms)	2.7%	2.8%	2.7%	0.946
Abnormalities by both (x-ray and symptoms)	2.3%	2.1%	2.2%	0.918
Quarry workers				
Abnormalities (by x-ray)	18.2%	16.7%	17.8%	0.891
Abnormalities (by symptoms)	7.5%	6.4%	7.3%	0.938
Abnormalities by both (x-ray and symptoms)	6.3%	6.4%	6.3%	1.00

There was no significant difference in the proportion of abnormalities by x-ray, symptoms and both x-ray and symptoms between male and female. The quarry workers had higher prevalence of respiratory symptoms (7.3% vs 2.7%; p<0.05) and x-ray abnormalities (17.8% vs 4.5%; p<0.05) as compared to persons persiding in the community.

Table.3. Prevalence of TB among the community and Quarry workers

Group	Total No. Surveyed	No. of positives (TB) confirmed by laboratory	Rate per 100000
community	1975	2	101
Quarry	331	4	1208

The prevalence of TB observed among quarry workers was 1208 per 1,00,000 and in the community it was only 101 per lakh. The tables 2 and 3 indicate that TB and Lung Function abnormalities are more prevalent among the quarry workers.

Table.4. Common illness identified in the community (N=1975)

Symptoms	No.	%
Shortness of breath	182	9.2
Cough	146	7.4
Eye irritation	116	5.9
Skin problem	81	4.1
Respiratory infection/cold	81	4.1

Table.5. Common illness identified among the Quarry workers (N=331)

Symptoms	No.	%
Shortness of breath	48	14.5
Cough	56	16.9
Eye irritation	16	4.8
Skin problem	5	1.5
Respiratory infection/cold	69	20.8

The proportion of symptoms (shortness of breath, cough and respiratory infection/cold) related to lung function is relatively higher in quarry workers. Further, the environmental parameters are being collected by Sathyabama University separately as they are one of the collaborators of this study. After the collection of environmental parameters, the desired spatial risk model will be developed.

6.2. Etiology of Acute febrile illness among patients attending selected health facilities in Gorakhpur, Uttar Pradesh

Manoj Murhekar, T. Jeromie, M. Ashok, Girish Kumar

Background:

Studies conducted earlier indicated that a significant proportion (>60%) of patients with Acute Encephalitis Syndrome admitted at the BRD Medical College, Gorakhpur have IgM antibodies against scrub typhus. Studies also indicated that AES patients were admitted late, the median duration between fever onset and hospitalization was 7 days (IQR: 5-10) and probably on account of this delay, the response to azithromycin among AES patients was not dramatic. Management of febrile illness patients early with appropriate antibiotic becomes important. In order to estimate the contribution scrub typhus among acute febrile illness patients attending peripheral health facilities, we established fever surveillance in three facilities during August 2016–October 2016, when most AES cases occur in the Gorakhpur division.

Objective:

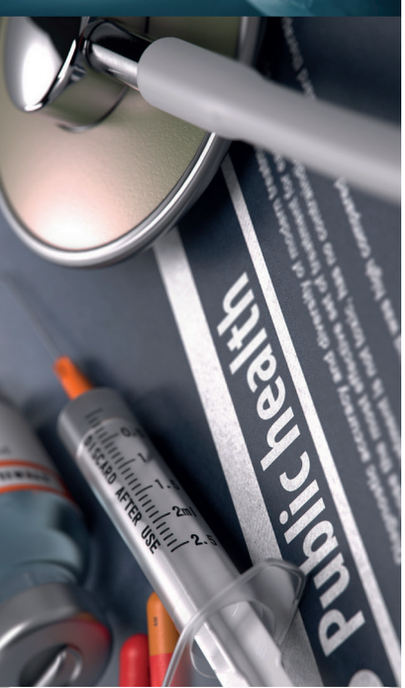
Estimate the proportion of AFI attending peripheral health facilities due to scrub typhus

Methods:

We established fever surveillance in three health facilities (CHC Campierganj, CHC Pipraich, PHC Bhatat). All the patients aged <=15 years attending these health facilities with a history of fever for more than 3 days were included. A detailed history was collected and clinical examination was conducted. 2 ml of blood sample was collected from the patients and the sera were examined for IgM antibodies against scrub typhus using commercial ELISA (Inbios, USA). The patients were followed up by telephone after ten days.

Results:

We enrolled 224 febrile patients during the period from 24 August 2016 to 22 October 2016. Of these, 53% were male and 45% were in the age group of <= 5 years. Most of them (91%) were resident of Gorakhpur district. The patients had fever for a median duration of 7 days. Physical examination of these 224 patients revealed lymphadenopathy (n=33, 15%), hepatomegaly (n=27, 12%), conjunctiva congestion (n=10, 4%), periorbital edema (n=5, 2%) and splenomegaly (n=6, 2%). Ten patients had maculopapular rash and three had Eschar (1%). Of these 224 patients, 42 (19%) had taken prior antibiotic before visiting the Government health facility, while 26% had taken some medications, the nature of which is not known to the patient. The serological testing for IgM and IgG antibodies against scrub typhus is ongoing.



7.0 PUBLIC HEATH TRAINING PROGRAMMES:

The ICMR School of Public Health:

The ICMR School of Public Health at the National Institute of Epidemiology has been conducting two-year Master of Public Health (Epidemiology and Health Systems) and one-year Post-Graduate Diploma in Bio-Ethics. The highlights of these programmes during the year 2014-15 are as under:

7.1. Master of Public Health (Epidemiology and Health Systems)

6th cohort of MPH (2013-15)

- MPH (EHS) is in its eighth year.
- 9/11 scholars of the sixth (2013) cohort graduated.
- 18 scholars of the seventh (2014) & 2 scholars of the sixth (2013) cohorts were in the process of data collection for their dissertation until March 2016.
- 19 scholars were admitted in the eighth cohort in July 2015 (10 Tamil Nadu, 3 Maharashtra, 2 West Bengal and one from each States of Arunachal Pradesh, Tripura & Uttar Pradesh)
- Director, NIE presented the 'Importance and role of alumni in FETP training and project implementation' at the TEPHINET Program Directors' Meeting, in Kuala Lumpur, Malaysia, November 13th – 15th, 2014.
- Scholars' work resulted in 13 publications in 2015
- Scholars awarded 2 mini-grants by TEPHINET, CDC, USA
    - Innovations in Surveillance National Baseline Mini-grant: Assessment of timeliness in detection and reporting of infectious disease outbreaks in 10 Indian States, 2003-2014
    - NCD mini grant: Evaluation of Referral mechanism in cervical and breast cancer screening program for women, Tiruchirappalli district, Tamil Nadu State, India, 2012-15.
- 3 publications
    - Allam, RR, et al. Survival probability and predictors of mortality and retention in care among patients enrolled for first-line antiretroviral therapy, Andhra Pradesh, India, 2008-2011. Trans R Soc Trop Med Hyg. 2014 Apr; 108(4):198-205.
    - Kiran, SK, et al. Kyasanur Forest Disease Outbreak and Vaccination Strategy, Shimoga District, India, 2013–2014.

Emerging Infectious Diseases. 2015 Jan;21(1):146-9.

- Dhayarkar, S, et al. Outbreak of waterborne hepatitis E, Pune, Maharashtra, India, 2013. Indian J CommunFam Med. 2015;1(01).

7.1.1 MPH DISSERTATION PROJECTS BY 7th COHORT (2014-16)

7.1.1.1. Prevalence of Non-communicable disease risk factors in the tribal population in Mokokchung District, Nagaland.

Dr. Aonungdok Tushi Ao / Mentor: Dr. Prabhdeep Kaur, Scientist D

Background:

NCDs are the leading causes of mortality globally. In India, chronic diseases (cardiovascular diseases, respiratory diseases, mental health disorders, diabetes and cancer) and injuries were the leading causes of death and disability in year 2011. There are limited or no studies on NCD risk factors in the tribal population of Nagaland. This study was done to determine the prevalence of NCD risk factors and awareness in the tribal population of Nagaland.

Objective :

The objective of this study was to estimate the prevalence and awareness level of non-communicable disease risk factors stratified by age and sex among 25 to 64 years old rural population of Mokokchung district, Nagaland.

Methods :

We did a cross sectional survey in 20 villages of Mokokchung district, Nagaland. Study population included 472 participants among 25 to 64 years of age stratified by age and sex. Cluster sampling method was used. WHO steps questionnaire was used for behavioral risk factors. Anthropometric, physical and biochemical (random blood glucose) measurements were collected.

Results :

Among males, 90 (38.1%) were current smokers and 65 (27.5%) were current alcohol users. Use of smokeless tobacco was prevalent among 139 (58.9%) males and 117 (49.6%) females. Inadequate fruits and vegetable intake was observed among 189 (80.1%) males and 221 (93.6%) females. Insufficient physical activity was observed among 16 (3.4%) of the participants. However, prevalence of hypertension and overweight was observed among 204 (43.2%) and 151 (32.4%) of the study population respectively.

Conclusions :

We observed high prevalence of NCD risk factors, hypertension and overweight among the study population. Hypertension is an emerging challenge which can be addressed at the primary care level. Health promotion activities need to be strengthened to encourage adoption of healthy lifestyle in the community.

7.1.1.2. Prevalence of use of toilet and associated factors in rural Beed district, Maharashtra, India 2015

Dr. Vikas Uttamrao Athawale / Mentor: Dr. Tarun Bhatnagar, Scientist D

Introduction :

Inadequate sanitation leads to several tropical diseases. Rural India comprises of 70% of the global population living without basic sanitation facilities. Two third of rural households in India do not use toilets and half of households in rural Maharashtra do not have toilet facility. Despite several government programmes to eliminate open defecation, 85% households in Beed district do not have access to toilet facility. Our objectives were to estimate prevalence of toilet use and toilet facility and determine the factors associated with it in rural Beed district.

Methods :

We conducted a population based cross sectional study in rural area of Beed district, India. We selected household members aged 10 and above using multi-stage cluster sampling. We defined current use as always use of toilet or never defecate in open in the week before the survey. We calculated the prevalence, attitude towards toilet use. We used multiple regression analysis to calculate odds ratios and 95% confidence intervals to identify the

factors independently associated with use of toilet.

Results :

Toilet facility was available in 87 (31.1%, 95% CI: 25.7-36.9) of 280 households. Prevalence of current use of toilet was 25% (95% CI: 20.5-30.7). Being educated upto graduate degree or higher (OR: 3.7; 95% CI: 1.6-8.7), living in pucca house (AOR: 7.3; 95% CI: 3.7-14.1), believing that children will be healthy in a village where everyone uses toilet (AOR: 6.7; 95%CI: 2.3-19.5), habit and tradition of open defecation (AOR:0.3, 95%CI: 0.1-0.9), higher score on 'feeling about toilet use' (AOR: 2.5; 95%CI: 1.3-5.1) and 'attitude' (AOR: 2.8; 95%CI: 1.6-5.2), men in the family asking for toilet construction (AOR: 4.4; 95%CI: 2.1-9.2), and seeing a street play/movie on toilet use (AOR: 2.8; 95%CI: 1.5-5.3) were significantly associated with toilet use.

Conclusion :

Availability of toilet facility and its use was very low. Many people were comfortable with practicing the tradition of open defecation. There is a need to create awareness regarding constructing and using toilet among general population coupled with understanding of behavioural and cultural factors. Current strategies of government programmes to promote toilet use do not seem to be effective.

7.1.1.3. Factors associated with Initial Default under RNTCP in Bijapur district, Karnataka, India, 2014-15

Dr. Shashidhar Somashekharappa Otageri/Mentor: Dr. Sanjay Mehendale, Scientist G

Background :

India, a country with the highest Tuberculosis disease burden, accounts for one fourth of the global incident infections and more than two thirds of the cases in South-East Asia. We observed that the proportion of sputum smear positive Initial Defaulters, (recently called as Pre treatment loss to follow up) was highest in Bijapur district of Karnataka, higher than the state and national averages, resulting in continued Tuberculosis spread, high TB associated mortality and high TB drug resistant cases. Migration was also a problem in Bijapur district. It is important to reduce the number of Initial Defaulters and also its spread, this study was undertaken to identify various risk factors associated with Initial Defaulters for TB treatment in Bijapur district of India.

Methods :

We performed a case control study by selecting a random sample of 155 Initial Defaulters who were not put on treatment (Cases) and 155 patients who were put on treatment (Controls), among the sputum positive patients aged more than 18 years, registered between October 2013 to September 2014 under RNTCP in Bijapur district. We used semi-structured interview schedules and carried out univariate and multivariate logistic regression in Epi-info software to identify the association between various factors and treatment default.

Results :

Out of 975 sputum smear positive pulmonary Tuberculosis cases reporting from October 2013 to September 2014, 776 (79.6%) were put on treatment at Bijapur, 15 (1.5%) reported for treatment outside the district. There were 194 (19.8%) Initial Defaulters. Among the 194 Initial Defaulter cases; 8 (4.1%) were dead and 11 (5.9%) were untraced. Initial Default was significantly higher in TB patients having more than five family members (AOR= 3.3; 95% CI 1.9-5.9; p< 0.00), those who had hidden the disease from society/friends (AOR= 2.7; 95% CI 1.5-4.6; p< 0.05), those who did not know about the duration of TB treatment (AOR= 2.2; 95% CI 1.1 - 4.1; p= 0.01), and those who had difficulty in getting TB drugs (AOR= 1.8; 95% CI 1.1 - 3.0; p= 0.01).

Conclusions :

We observed that unwillingness to share the existence of TB with others probably due to stigma, lack of knowledge and difficulty in getting drugs as significant risk factors

for TB treatment default. We recommend regular counseling, Social Mobilization activities (ACSM) and sensitization of all Health Staff regarding early diagnosis and timely initiation of TB treatment to reduce the number of Initial Defaulters.

7.1.1.4. Poor patient adherence to anti-malarial combination therapy with Artesunate, Sulfadoxine-Pyrimethamine and Primaquine in Bandhugaon block, Koraput, Odisha, India, 2015: Immediate need of malaria programme attention

Dr. Ashutosh Das / Mentor: Dr. P. Manickam, Scientist D

Introduction :

Prompt treatment with artemisinin-based combination therapy (ACT) is the most cost effective strategy to control falciparum malaria. To maximize its effectiveness, patient adherence is essential. Non-adherence leads to increase in incidence and mortality. However, there is wide variation among adherence estimates across settings, drug regimens, study designs, definitions and measurement of adherence. We estimated adherence to Artesunate, Sulfadoxine- Pyrimethamine and Primaquine regimen in high incidence Koraput district in India.

Methods :

We did a prospective cohort study and included falciparum malaria patients initiated on ACT. We followed them till scheduled completion of treatment and measured adherence by asking questions, pill counts and a composite measure combining both. We defined adherence as complete treatment with respect to National malaria drug policy, 2013 recommended dose, duration and frequency. We compared adherent and non-adherent participants to determine the factors associated.

Results :

Out of 119 participants recruited, 18.5% (95% CI; 12.0%-26.6%) were adherent to oral anti-malaria regimen of AS, SP and PQ. Drug-specific adherence were measured to be 67.2% for ACT, 74.8% for AS, 88.2% for SP and 21.1% for PQ. Adherence was 51.7% for ACT by counting pills and 67.2% by composite measure of adherence. The kappa statistics for self report by interview and pill count in blister packet was 0.967. Age- specific adherence was higher in infants (40%) and lowest in 9-14 years (7.1%) and there was no difference by gender (19.4% in males and 17.5% in females). On comparison of adherent and non-adherent participants, reminder by health worker for completing treatment [OR=4.4; 95% CI: 1.53-12.60] was found to be significant.

Discussion :

We estimated that adherence level is poor for oral anti-malarial regimen but we found better adherence for ACT and individual drugs. Lack of uniform methodology makes true comparison with other studies difficult. We identified that reminder by the health staff could be helpful for improving adherence. It can solve one third of the adherence issues. We recommend training of ASHA and ANM for reminding the patient to improve adherence.

7.1.1.5. Factors associated with Utilisation of public health institutes for delivery, Beed district, Maharashtra, India, 2015

Dr. Satish Bapurao Shinde / Mentor : Dr. Tarun Bhatnagar, Scientist D

Introduction :

Surveillance data on Reproductive and Child Health program of Government of India in Beed district of Maharashtra state indicated relative low proportion of institutional deliveries in public than private health institutes. The cost (High out-of-pocket expenditure) is barrier for institutional delivery for 17.9% families in India. We explored the factors which influenced choice of place of delivery private or public hospital.

Material and Methods :

During January to March 2015 we conducted unmatched case control study was conducted. We recruited and assessed rural women who had recently delivered at either private (cases) or public (controls) health institutes in Beed district.

Results :

Mothers education secondary schooling or more (OR: 2.8, 95% CI: 1.7 – 4.5), Scheduled caste or tribe (OR: 0.4, 95% CI: 0.2-0.8), Highest to lowest income quartile (AOR: 2.7, 95% CI: 1.3-5.9), capacity to pay for delivery services (AOR: 0.1, 95% CI: 0.1-0.2) and system related factors as convenient facility (AOR: 0.1, 95% CI: 0.1-0.2), available

delivery services (AOR: 6.6, 95% CI: 3.2-13.6), accountability of provider (AOR: 4.3, 95% CI: 2.2- 8.3), trained providers (AOR: 0.2, 95% CI: 0.1-0.4) were influencing factors.

Conclusion :

The choice of private or public health facility was influenced by availability of services and accountability of provider irrespective of education and income of women. We used broad categories as private and public. We recommend the need to improve communication skills of providers. We recommend that the services should be more responsive to the women's need and the patient centeredness should be incorporated into the quality assessment. Maternal health programs and policies should develop systems of accountability with guiding principles. There is further need of more research into predictors of public health institutes utilisation for delivery in developing countries.

7.1.1.6. Factors associated with low acceptance of Kyasanur forest disease vaccine in at risk population Community Health Centre, Kannangi, Shimoga district, Karnataka, 2014-15

Dr. Kiran S K Keshavamurthy S P / Mentor: Dr. J Yuvaraj, Scientist F

Introduction :

Government of Karnataka is conducting vaccination for Kyasanur forest disease (KFD) in endemic areas of the state. But vaccine acceptance is low among at risk population. We conducted case control study to determine factors associated with low acceptance.

Method :

We selected 20 out of 54 affected villages in the KFD outbreak of 2013-14 from CHC Kannangi by simple random sampling. From the vaccination registries of these villages, 9 each vaccinated and unvaccinated persons in the age group of 26-59 years were selected by simple random sampling. Our achieved sample size was 344 out of calculated sample size of 360.

Results :

vaccine related factors like, 'fear of adverse reaction following vaccination', 'not knowing that vaccine needs to be taken yearly' and 'advised not to take were found to be positively associated. Factors of perception of risk about disease like, 'those who think chance of contracting KFD disease is low', 'those who think one is Fit enough to face the disease like KFD' and 'those who think KFD is not a severe disease' are found to be significantly associated with low acceptance of vaccine. Among the Knowledge of outbreak and disease related factors of KFD, 'absence of Knowledge of the outbreak' and 'not knowing Tick bite leads to KFD' were found to be associated.

Conclusion :

Efforts need to be focused to minimize fear associated with vaccination. Perception of risk about disease is deterring vaccine acceptance. Need to educate people about risk of disease, Knowledge of outbreak and Tick bite leads to KFD.

7.1.1.7. Effect of behaviour change intervention on hand washing with soap among school students of 6th to 8th standard, Ammapalayam block, Perambalur district, Tamil Nadu, India, 2014-2015.

Dr. M Geetha Rani / Mentor: Dr. S. Thilakavathi, Scientist F

Introduction :

Considering high incidence of Acute Diarrhoeal Diseases especially among school students, we conducted behavioural change intervention among middle school students, to compare adequate hand washing before and after intervention in a rural area of Tamil Nadu, India.

Methods :

200 representative students were selected through simple random sampling as matched pair. We calculated and compared the proportions and Mc-Nemars chi-square test for currently practicing adequate hand washing, knowledge about importance and 6-steps in the hand washing before and after intervention. The intervention included oral and poster presentations, demonstration and competition on proper washing procedures to all students. Outcomes were collected by semi-structured questionnaire at base line and at two follow up visits (one month and two months after the intervention).

Results :

At one month, proportion of adequate hand washing was improved from baseline 0 % to 7% with Mc-Nemars chi-square=13.07,p-value=<0.001,the proportion of Knowledge about importance of hand washing was improved from 45% to 61% with Mc-Nemars chi-square=16.13 , p-value=<0.001,and knowledge about 6-steps in hand washing improved from 0% to 78.5% with Mc-Nemars chi-square=156, p-value=0.001,all of which were statistically significant. At two month, proportion of adequate hand washing was improved to 5.5% with Mc- Nemars chi-square=10.08, p-value=<0.001, the proportion of Knowledge about importance of hand washing was improved to 61 % with Mc-Nemars chi-square=138.69, p-value=<0.001 and knowledge about 6-steps in hand washing improved to 86% with Mc-Nemars chi-square= 171, p-value=0.001, all of which were again statistically significant.

Conclusion :

After intervention, there was a minimal improvement in adequate hand washing at the end of one and two months and better improvement of knowledge on importance of hand washing with soap and following the 6-steps. The same intervention may be done in schools to improve the knowledge and hand washing practices among school children.

7.1.1.8. Contribution of Non-communicable disease to the causes of death in Lunglei town, Mizoram, 2014-15

Dr. Zorinsangi / Mentor: Dr. P. Manickam, Scientist D

Background :

Non-communicable diseases have become the leading cause of mortality globally as well as in developing countries like India. Mortality data is useful for prioritizing the health problems and to appropriately allocate resources and further evaluate health programs. There is an urgent need for reliable quantification of causes of death to guide the recently launched National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) was launched recently in Mizoram.

Method:

We did a cross sectional study of deaths among adults above 15 years of age occurring in one year period at Lunglei town, Mizoram. We proposed cluster sampling with a sample size of 197 deaths. However, we surveyed all the deaths in Lunglei town. Data was collected regarding cause of death using verbal autopsy tool along narrative history. The cause of death and International Classification of Diseases (ICD) 10 were assigned by two medical doctors independently.

Results :

We surveyed 239 deaths. Overall 46% of the deceased were 30-59 years of age at the time of death, majority (99%) belonging to scheduled tribe community. Overall, NCDs were the major cause of death (72%) as compared to infectious diseases (13%). Neoplasm was the leading cause of death (27%), stomach being the most common site. The second major cause of death was disease of the circulatory system (20%) which along with neoplasms contributed majority of deaths in middle and older age groups in those above 44 years. Behavioral risk factor like smoking was highly prevalent among both males (73%) and females (43%). Deaths due to external and mental/behavioral causes collectively contributed half of deaths in younger males below 30 years.

Conclusions :

Non-communicable diseases such as neoplasms and circulatory system diseases were the leading causes of mortality. Interventions incorporating community engagement and participation should be developed to address behavioral risk factors and to strengthen ongoing programs in the district for NCDs.

7.1.1.9. Issues in disbursement of cash benefit to eligible mothers – Dr. Muthulakshmi Reddy Maternity Benefit Scheme (MRMBS), Krishnagiri (Rural) District, Tamil Nadu, India, 2014-15

Dr. Ganesh S R / Mentor: Dr. Sanjay Mehendale, Scientist G

Background:

A flagship program in safe motherhood scheme, named after Dr. Muthulakshmi Reddy, Tamil Nadu's first woman doctor and social activist, was launched in 1987 by Government of Tamil Nadu. As per the scheme cash benefit of Rs. 12,000 is credited in three installments to the scheme beneficiary pregnant women's

accounts who are living below poverty line (BPL) to compensate for the wage loss during pregnancy and to help in getting nutritious food to avoid low birth weight babies.

Methods :

We performed a cross-sectional study with a sample size of 188 health and non- health functionaries. We selected 76 Village Health Nurses (Health-sector) from 76 health centres and all the program functionaries of Health-sector and Non-health sector involved in MRMBS scheme during November 2014 and February 2015 from Krishnagiri (Rural) District of Tamil Nadu. We used semi-structured interview schedule and carried out analysis to determine proportions of reasons for delay in disbursement of cash benefit under MRMBS scheme.

Results :

All program functionaries from health and non-health sector from Krishnagiri district of Tamil Nadu involved in MRMBS scheme responded. Majority of the program functionaries from all sectors faced an increase in work burden due to scheme related work load. Bank account opening by newly married pregnant women, lack of functional internet connectivity at health facilities (HSC and PHC), hanging of PICME web portal during day hours, ECS beneficiary list at the block PHCs without PICME number, non-acceptance of beneficiary list and delay in providing token number by sub-treasury, difficulty in procedures of bank with regard to account opening, pass book entry, providing details on cash credit status to the beneficiary, lack of availability of scheme benefitted beneficiary list at block PHC from bank were identified as various issues in health-sector which resulted in delayed disbursement of benefits. Delay in submission of monthly scheme beneficiary list and errors in providing account details of the beneficiary, errors in submission of required documents for account opening, remitting and opening deposit accounts and errors in periodical transfer of funds were the main issues in the non- health sector resulting in delayed payments under MRMBS scheme.

Conclusions :

We noted staff vacancies, in field level program functionaries (VHN,SHN, CHN) in health sector and over accumulation of beneficiary list at the end of each month submission of beneficiary list with errors at sub-Treasury by Block PHCs and banking rules restricting easy account opening of bank accounts as well as problems in transfer of funds to the bank regularly and periodically from treasury to be the main reasons for increase in work load for the program functionaries in health and non-health sectors during implementation of the scheme. We recommend few modifications in the infrastructure and improvement in logistics of the scheme implementation to timely facilitate the disbursement of cash benefit to the beneficiaries under MRMBS scheme.

7.1.2 MPH FIELD PROJECTS - 6TH COHORT (2014-16)

MPH scholar	Programme Evaluation	Secondary Data Analysis	NIE mentor
Dr. Banurekha VV	Evaluation of the Revised National Tuberculosis Control Programme for anti- TB treatment initiation of diagnosed sputum positive pulmonary TB patients in Chennai, 2015	Treatment outcome and factors associated with delayed treatment initiation among sputum positive pulmonary TB patients treated under Revised National TB Control Programme in Chennai, Tamil Nadu, 2013	Dr. Sanjay Mehendale

Dr. Baranidharan B	Evaluation of the Universal immunization programme (UIP) among migrant population, Poonamallee Health Unit District, Tamil Nadu, India, 2015	Estimation of Low birth weight and its associated factors among newborns registered in Pregnancy Infant Cohort monitoring and Evaluation (PICME) of Poonamallee Health Unit District, 2010 – 14	Dr. R Ramakrishnan
Dr. Falguni Debnath	Description & Evaluation of acute diarrhoeal disease surveillance under Integrated Disease Surveillance Programme in North 24 Parganas, West Bengal, 2015'	Descriptive epidemiology of Acute Diarrheal Diseases, North 24 Parganas, West Bengal, 2010-14	Dr. P Manickam
Dr. Saroja M	Presentation of the evaluation of programme/project on NHM – Adolescent Health schemes	Presentation of secondary/surveillance data analysis of Fire accidents in Sivakasi 2011-2014	Dr. Prabhdeep Kaur
Dr. Bhavani P K	Evaluation of Antenatal Component of Reproductive and Child Health programme in Thiruvottiyur Zone, Chennai district, Tamil Nadu	Utilisation of Antenatal services by Pregnant women of Chennai District, Tamil Nadu, 2011-14	Dr. Manoj V Murhekar
Dr. Yogananth N	Description and evaluation of Swachh Bharat Mission (Gramin)in rural Dharmapuri district, Tamil Nadu, India, 2014-2015	Diarrhoeal disease, Water and Sanitation facility in rural Dharmapuri district, 2011 -2014	Dr. Tarun Bhatnagar
Dr. Nilanjan Mondal	Description and Evaluation of maternal care part of ASHA program in Howrah district, West Bengal, 2015	Coverage of antenatal care in Howrah, West Bengal, 2011-14: Analysis of Mother and Child Tracking System (MCTS) data	Dr. Manoj V Murhekar

Dr. Velmurugan Ganesh G	Description & Evaluation of Reproductive and Child Health (RCH) programme for detection of high risk in pregnant mothers in Tiruvallur health unit district, Tamil Nadu, 2015	Analysis of antenatal high risk mothers in pregnancy & infant cohort monitoring and evaluation (PICME) system, Tiruvallur district, Tamil Nadu, 2015	Dr. P Manickam
Dr. Ansari Md Rafiquddin Md Kabeeruddin	Evaluation of Case Detection Component of RNTCP in Bhoom TU of Osmanabad district, Maharashtra, 2015	Trends in Major Performance Indicators of RNTCP in Osmanabad district of Maharashtra, 2010-14	Dr. R Ramakrishnan
Dr. Viduthalai Virumbi B	Description of public health preparedness and setting up of syndromic surveillance system during Godavari Pushkarams Festival	Maternal and child factors related to Infant Mortality, Tamil Nadu, India, 2011-2014	Dr. P Manickam
Dr. Vijayalakshmi V	Evaluation of Universal Immunization Programme among Migrant Population in two blocks of Saidapet HUD, Tamil Nadu, 2014	Dengue fever in Saidapet Health Unit District, Tamil Nadu, India, 2010 - 2014	Dr. Tarun Bhatnagar
Dr. Biswajit Dey	"Chief Minister's Comprehensive Health Insurance Scheme" and beneficiary satisfaction with the utilization of the scheme in empanelled government and private hospitals, Tamil Nadu, India, 2012-15	Maternal health care in Murshidabad, West Bengal, India, 2013-14	Dr. Manoj V Murhekar
Dr. Vinay Kumar K	"Chief Minister's Comprehensive Health Insurance Scheme" and beneficiary satisfaction with the utilization of the scheme in empanelled government and private hospitals, Tamil Nadu, India, 2012-15	Utilization of Chief Minister's Comprehensive Health Insurance Scheme, Tamil Nadu, 2012-14	Dr. Manoj V Murhekar

Dr. Vidhya V	Evaluation of facility and home based postnatal care in Namakkal, Tamil Nadu, India, 2014-15	Maternal deaths in Namakkal district during the 2004-15	Dr. R Ramakrishnan
Dr. Prakash V	Evaluation of Hospital Management System in secondary care hospitals of Thiruvarur district, Tamil Nadu, 2014	Assessment of data quality in terms of 'completeness' in Hospital Management System data of secondary care hospitals, Thiruvarur district, Tamil Nadu, December, 2014	Dr. Prabhdeep Kaur
Dr. Balasubramaniyan N	Evaluation of the National Vector Borne Disease Control Program (NVBDCP) for dengue fever prevention and control in Villupuram Health Unit District (HUD) Tamil Nadu, 2014.	Analysis of Reported Dengue Fever Cases in Villupuram Health Unit District (HUD), 2013 - 2014	Dr. P Ganesh Kumar
Dr. Asha Frederick	Programmatic Management of Drug Resistant Tuberculosis in two Districts, Tamil Nadu	Survival analysis of Multidrug resistance Tuberculosis patent 2013-2014, Tamil Nadu	Dr. J Yuvaraj
Dr. Boopesh N	Evaluation of Early case detection and treatment completion Activity of National Leprosy Eradication Programme (NLEP) in Kallakurchi Health Unit District (HUD) of Tamil Nadu, India-2015	Analysis of Data On Leprosy Cases Released From Treatment Under National Leprosy Eradication Programme In Kallakurichi Health Unit District, Tamil Nadu 2009-2014	Dr. P Ganesh Kumar
Dr. Pradeep Aravindan Menon	Evaluation of Second Line Antiretroviral Therapy Arm in Government Hospital for Thoracic Medicine (GHTM), Tambaram, Chennai under the National AIDS Control Programme (NACO).	Secondary Data Analysis Of Patients On Second Line ART at GHTM, Tambaram, 2008-2014	Dr. R. Ramakrishnan
Dr. Dhande Sachin Murlidhar	Evaluation of Integrated Counseling and Testing Centres in Pune District, Maharashtra, 2014	Secondary Data analysis of Integrated Counselling and Testing Centres (ICTC) in Pune district, Maharashtra, India, 2012	Dr. R. Ramakrishnan

7.2. NIE-ICMR e-Certificate (NieCer) Courses:

Building on the achievements through ICMR School of Public Health, NIE proposed to strengthen the research capacity in India in a big way through online courses. In this context, NIE launched its online courses on conduct of human bio-medical research. The programmes were offered as 'NIE-ICMR e-Certificate' – NIeCer courses.

NIE established collaboration with National Programme on Technology Enhanced Learning (NPTEL). It is a joint initiative of the IITs and IISc, under the Ministry of Human Resource Development, Govt. of India. NPTEL offers largest repository of free MOOCs (Massive Open Online Course) in engineering, science and humanities from India's best Institutes. In the last 12 years, NPTEL has offered 850 web and video courses across 23 disciplines.

The first in this series of Massive Open Online Courses (MOOCs), NIeCer 101: Health Research Fundamentals, is a basic level course in health research methods. 8 week course in collaboration with National Program for Technology Enhanced Learning (NPTEL), HRD Ministry funded initiative of IITs and IISc, Jan-Mar. 2016. There were 3067 enrollments from across the country.

Web page of NIeCer 101: Health Research Fundamentals

8. PUBLICATIONS

1	Fredrick T, Kaur P, Murhekar MV, Jayaraman Y, Kolandaswamy K, Rao SR, David JK. Diabetic retinopathy and its risk factors in patients with type 2 diabetes attending rural primary healthcare facilities in Tamil Nadu. Nat Med J India.2016;Feb:29(1):9-13.
2	Gupt A, Kaur P, Kamraj P, Murthy BN. Out of Pocket Expenditure for Hospitalization among Below Poverty Line Households in District Solan, Himachal Pradesh, India, 2013. PLoS One. 2016;Feb;11(2):e0149824.
3	Tyagi U, Pattabi K, Kaur P. Utilization of Services Under Janani Shishu Suraksha Karyakram for Institutional Deliveries in the Public Sector Facilities, Sirmaur District, Himachal Pradesh, India. Indian J Community Med. 2016;41(1):65-8.
4	Ghate M, Mehendale S, Meyer R, Umlauf A et al. The effects of antiretroviral treatment initiation on cognition in HIV-infected individuals with advanced disease in Pune, India. J Neurovirol. 2015 Aug;21(4):391-8.
5	Joshua V, Mehendale S. Gupte MD. Bayesian Model, ecological factors and transmission of leprosy in an endemic area in South India. IJMR 143, Jan 2016;104-6
6	Sahay S, Deshpande S, Bembalkar S, Kharat M, Parkhe A, Brahme RG, Paranjape R, Bollinger RC, Mehendale SM. Failure to Use and Sustain Male Condom Usage: Lessons Learned from a Prospective Study among Men Attending STI Clinic in Pune, India. PLoS One. 2015; 13;10(8):e0135071.
7	Ramachandran V, Manickam P, Kaur P, Murhekar M, Kanagasabai K, Jeyakumar A, Selvaraj V. Behavioural Determinants Associated with CHIKV Outbreak in Gouriepet, Avadi, Chennai, South India. J of Biomed Sci. 2015;4(1):4.
8	Krishnan S, Sivaram S, Anderson B, Basu P, Belinson J, Bhatla N, Cruz AD, Dhillon PK, Gupta PC, Joshi N, Jhulka PK, Kailash U, Kapambwe S, Katoch VM, Kaur P, Kaur T, Mathur P et al. Using implementation science to advance cancer prevention in India. Asian Pacif Jou Can Prev (APJCP). 2015;16(9):3639-44.
9	Murhekar MV, Kasabi GS, Mehendale SM, Mourya DT, Yadav PD, Tandale BV. On the transmission pattern of Kyasanur Forest disease (KFD) in India. Infect Dis Poverty. 2015; 19;4:37
10	Sinha A, Chandhiok N, Sahay S, Deb S, Bharat S, Gupta A, Bhatt S, KantheV, Kumar B, Joglekar N, Paranjape R, Mehendale S. Male circumcision for HIV prevention in India: emerging viewpoints and practices of health care providers. AIDS Care. 2015; 27(9):1196-8.
11	Allam RR, Murhekar MV, Bhatnagar T, Uthappa CK, Nalini C, Rewari BB, Mehendale SM. Predictors of immunological failure and determinants of suboptimal CD4 testing among adults with HIV on first-line antiretroviral therapy in Andhra Pradesh, India, 2008-2011. Trans R Soc Trop Med Hyg. 2015;109(5):325-33.
12	Uthappa CK, Allam RR, Gunti D, Nalini C, Udaragudi PR, Tadi GP, Murhekar MV. Chikungunya outbreak in Atmakur village, Medak district, Telangana State, India. Indian J Med Res. 2015;142 Suppl:S108-10.
13	Kasabi GS, Subramanian T, Allam RR, Grace CA, Reddy S, Murhekar MV. Prescription practices & use of essential medicines in the primary health care system, Shimoga district, Karnataka, India. Indian J Med Res. 2015;142(2):216-9.
14	Murhekar M. Hepatitis B vaccination among the Nicobarese tribe: Need to document the impact. Indian J Med Res. 2015 May;141(5):662.
15	Uthappa CK, Allam RR, Nalini C, Gunti D, Udaragudi PR, Tadi GP, Murhekar MV. An outbreak of cholera in Medipally village, Andhra Pradesh, India, 2013. J Health Popul Nutr. 2015; 24;33:7

16	Prabhu R, Manickam P, Mahalingam V, Jayashree P, Selvaraj V, Mehendale SM. Relapse and deformity among 2177 leprosy patients released from treatment with MDT between 2005 and 2010 in South India: A retrospective cohort study. Lep Rev. 2015; 86: 345–355.
17	Ramachandran V, Bharadwaj NK, Kanagasabai K, Manickam P, Murhekar MV. Institutional partnerships and epidemiological evidence reorients policy and strengthens health systems to improve institutional deliveries in the hilly State of Himachal Pradesh: A community-based translational research effort. Int J of Med and Phar Sci (IJMPS) 2015; 5(4): 11-26
18	Ramachandran V, Kanagasabai K, Kamaraj P, Manickam P, Murhekar MV. Coverage and quality of home and health facility-based, maternal and newborn post-partum / post-natal care services in Krishnagiri district, Tamil Nadu, South India: A community-based assessment. Int J of Med and Phar Sci (IJMPS). 2015; 5(2): 33-48
19	Kumar T, Pal P, Kaur P. Health seeking behaviour and health awareness among rural and urban adolescents in Dehradun District, Uttarakhand, India. Int J of Adol medi and heal. 2015;11:10
20	Nath L, Kaur P, Tripathi S. Evaluation of the universal immunization program and challenges in coverage of migrant children in Haridwar, Uttarakhand, India. IJCM. 2015;40(4):239-245.
21	Ramesh R Allam, Chengappa K Uthappa, ChavaNalini, Prasada R Udaragudi, Geetha P Tadi, Manoj V Murhekar. An outbreak of cholera due to contaminated water, Medak District, Andhra Pradesh, India, 2013. IJCM, 2015;40(4):283-285.
22	Haldar P, Morineau G, Das A, Mehendale S. A surveillance model for sexually transmitted infections in India. Indian J Public Health. 2015;59(4):286-94.
23	Nipte D, Dhayakar S, Pawar S, Venkatsubramanian S, Mehendale S. Determinants of early discharge of mothers from hospitals after delivery in Beed block of Beed District, Maharashtra, India 2014. Clin Epid Glo Heal. 2015; 3(1), S26-S33.
24	Dhayarkar S, Chadha M, Tripathy A, Jadhav S, Deshmukh N, Mehendale S. Outbreak of water-borne hepatitis E, Pune, Maharashtra, India, 2013. IJCFM. 2015;1(1):45-50.
25	Pillai RK, Mehendale S, Awasthi S, Varma GR. The Significance of research in post-graduate education and ways to facilitate. Clin Epid Glob Heal. 2015; 3(2), 58-62.
26	Senthil SM, Chandrasekar P, Priya S, Kaur P. Acceptance of cervical and breast cancer screening and cancer awareness among women in Villupuram, Tamil Nadu, India: A cross sectional survey. Clin Epid Glob Heal. 2015; 3: S63-S68.
27	Gupt A, Bhatnagar T, Murthy BN. Epidemiological profile and management of snakebite cases – A cross sectional study from Himachal Pradesh, India. Clin Epid glob Heal. 2015; 3: S96-S100.
28	Marak B, Bhatnagar T. Sexual behaviours and condom use among young urban women in a town in northeast India: Implications for prevention and control of sexually transmitted infections. Clin Epid Glob Heal. 2015; 3 S43-48.

9.0 List of Staff members (as on March 2016)

SL. No.	Name	Designation
	SCIENTIFIC STAFF	
Group-A		
1	Dr. Sanjay M. Mehendale	Director & Scientist-G
2	Dr. M.V. Murhekar	Scientist-G
3	Dr. R. Ramakrishnan	Scientist-G
4	Dr. Thilakavathi Subramanian	Scientist-F
5	Mr. A. Elangovan	Scientist-F
6	Dr. J. Yuvaraj	Scientist-F
7	Mr. J. Arockiasamy	Scientist-D
8	Dr. Prabhdeep Kaur	Scientist-D
9	Dr. C.P. Girish Kumar	Scientist-D
10	Dr. Tarun Bhatnagar	Scientist-D
11	Dr. P. Manickam	Scientist-D
12	Dr. B. Ganesh	Scientist-D
13	Dr. Rajkumar Prabu	Scientist-C
14	Dr. P. GaneshKumar	Scientist-C
15	Dr. Vasna Joshua	Scientist-B

TECHNICAL STAFF		
Group-A		
1	Mrs. R. Jayasri	Technical Officer - B
Group-B		
1	Mr. N. Ramalingam	Technical Officer - A
2	Dr. R. Ezhil	Technical Officer - A
3	Mr. L. Sundaramoorthy	Technical Officer - A
4	Mr. C. Govindhasamy	Technical Officer - A
5	Mr. K. Kanagasabai	Technical Officer - A
6	Mr. B.K. Kirubakaran	Technical Officer - A
7	Mr. M. Ravi	Technical Officer - A
8	Dr. S. Venkatasubramanian	Technical Officer - A
9	Mrs. R. Sudha	Technical Officer - A
10	Dr. N. Uthayakumaran	Technical Officer - A
11	Mr. Rang Lal Meena	Technical Officer - A
12	Mr. P. Kamaraj	Technical Officer - A
13	Mr. K. Boopathi	Technical Officer - A
14	Mr. S. Satish	Asst. Library & Information Officer
15	Ms. P. Jayasree	Technical Assistant (Research)
16	Mr. T. Daniel Rajasekar	Technical Assistant (Research)
17	Mr. V. Ramachandran	Technical Assistant (Research)
18	Mr. G. Elavarasu	Technical Assistant (Research)
19	Mr. S. Lucas Leonard	Technical Assistant (PMW)
20	Ms. Mercy Mallika	Technical Assistant (PMW)
21	Mr. M. Thiyagarajan	Technical Assistant (Lab)
22	Mr. A. Mohan	Technical Assistant (PMW)
23	Mrs. P. Kannaki	Technical Assistant
24	Mrs. A. Tamilarasi	Technical Assistant
25	Mrs. P. Shantha	Technical Assistant
26	Ms. P. Lourdu Stella Mary	Technical Assistant
27	Mrs. R. Shanthi	Technical Assistant
28	Mrs. M.R. Santhi	Technical Assistant
29	Mrs. I. Kalaimani	Technical Assistant
30	Mr. P. Ashok Kumar	Technical Assistant (PMW)
31	Mr. A. Jeya Kumar	Technical Assistant (Research)
32	Mr. S.A. Raveendra	Technical Assistant
33	Mr. N. Vengatesan	Technical Assistant
34	Mr. T. Karunakaran	Technical Assistant (Lab)
35	Mr. A. Suresh	T. A. (Health System Research)
36	Ms. R. Vijayaprabha	Technical Assistant (Social Work)
37	Mr. R. Kadirvelu	Technical Assistant
38	Mr. Rakesh Kumar Yadav	Technical Assistant
39	Mr. T. Ravichandran	Technical Assistant
40	Mr. M. Jagga Babu	Technical Assistant

41	Mr. C. Sagayanathan	Technical Assistant
42	Mr. R. Harikrishnan	Technical Assistant
43	Mr. K. Satish Kumar	Technical Assistant
44	Mr. P. Osoor	Technical Assistant
45	Mrs. Annamma Jose	Technical Assistant
46	Mr. M. Murali Mohan	Technical Assistant
47	Mr. D. Murugan	Technical Assistant
48	Mr. D. Augustine	Technical Assistant
49	Mr. R. Ramakrishna Rao	Technical Assistant
50	Mr. C. Prabakaran	Technical Assistant
Group-C		
1	Mr. V. Ramesh	Technician - C (PMW)
2	Mr. T. Subba Rao	Technician - C (PMW)
3	Mr. R. Gopinath	Technician - C (PMW)
4	Mr. M. Anthony Doss	Technician - C (PMW)
5	Mr. A. Gnanamurthy	Technician - C (Lab)
6	Mr. A. Thangavelu	Technician - C
7	Mr. A. Krishna Kumar	Technician - C
8	Mr. K. Ramu	Technician - C
9	Mr. A. Kaleb Raja Kumar	Technician - C (Lab)
10	Mr. V.S. Ashok Kumar	Technician - B
11	Mr. R. Ravi	Technician - B
12	Mr. M. Tamilmani	Technician - B
13	Mr. K. Damodaran	Technician - B
14	Mr. S. Baskaran	Technician-A
15	Mr. D. Prabaharan	Technician-A
16	Mr. M. Saravanan	Technician-A
17	Mr. A. Valli Theivanai Pangalan	Technician-A
18	Mr. H. Dinesh Kumar	Technician-A
19	Mr. V. M. Srinivasan	Technician-A (Electrician)
20	Mr. T. Magesh	Technician-A (Lab)
21	Mr. D. Gunasekaran	Technician-A (GRC)

ADMINISTRATIVE STAFF		
Group-A		
1	Ms. V. Sudha	Senior Administrative Officer
Group-B		
1	Mr. N.K.S. Brahaspathy	Private Secretary
2	Mr. A. Murugarasan	Private Secretary
3	Mrs. D. Parvathi	Asst. Accounts Officer
4	Mrs. R. Udayalakshmi	Section Officer
5	Mr. Michael Antony Joseph	Section Officer
6	Mr. S. Kumaravel	Section Officer
7	Mrs. Shanthi Balasubramanian	Assistant
8	Mrs. K. Pappu	Assistant
9	Mrs. Uma Manoharan	Personal Assistant
10	Mrs. R. Alamelu	Personal Assistant
11	Mrs. G. Umaiya Parvathy	Assistant
12	Mr. P. Raja	Assistant (Ad-hoc)
Group-C		
1	Mr. Raj Kumar	UDC
2	Mr. R. Arumugam	Stenographer
3	Mrs. R. Janaki	Stenographer
4	Mrs. K. Mahalakshmi	Stenographer
5	Mr. A. Subramani	LDC
6	Mrs. P. Sharly Devi	LDC
7	Mr. S. Suresh	LDC
8	Mr. N. Maharaja	LDC
9	Mr. V. Chandrasekar	LDC
10	Mr. P.B. Santhosh Kumar	LDC
11	Mr. A. Mani	Staff Car Driver (Special Grade)
12	Mr. P. Baskaran	Staff Car Driver (Grade-I)
13	Mr. S. Sittayya	Staff Car Driver (Grade-I)
14	Mr. K. Paramasivam	Staff Car Driver (Grade-I)
15	Mr. D. Anandaraj	Staff Car Driver (Grade-I)
16	Mr. R. Ranganathan	Staff Car Driver (Grade-I)
17	Mr. D. Justinraj	Staff Car Driver (Grade-II)
18	Mr. E. Thiruppugazh	Staff Car Driver (Grade-II)
19	Mr. K. Karthikeyan	Staff Car Driver (Ord. Grade)
20	Mr. D. Jayaraman	Staff Car Driver (Ord. Grade)
SUPPORTIVE STAFF		
1	Mr. K. Swaminathan	Field Assistant
2	Mr. A. Mani	Field Assistant
3	Mr. L. Kul Bahadur	Field Assistant
4	Mr. P. Thulasi	Attendant (Services)
5	Mrs. S. Mallika	Attendant (Services)
6	Mr. K. Loganathan	Attendant (Services)

7	Mr. M. Anbalagan	Attendant (Services)
8	Mr. E. Gandhidoss	Attendant (Services)
9	Mr. K. Shanmugam	Attendant (Services)
10	Mr. S. Sudandaraselvan	Attendant (Services)
11	Mr. M.R. Ravi	Attendant (Services)
12	Mrs. S. Sarada	Attendant (Services)
13	Mrs. K. Kasthuri	Attendant (Services)
14	Mrs. A. Nirmala	Attendant (Services)
15	Mr. E. Anandan	Attendant (Services)
16	Mr. V. Penchala Narasaiah	Attendant (Services)
17	Mrs. S. Jamuna	Attendant (Services)
18	Mr. A.S. Madhan	Attendant (Services)
19	Mr. D. Mahendran	Attendant (Services)
20	Mr. M. Boopathy	Multi-Tasking Staff (MTS)