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ICMR-National Institute of Epidemiology

Annual Report - 2018

Contents

RESEARCH ACTIVITIES

1. INDIA HYPERTENSION MANAGEMENT INITIATIVE

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Co-Investigator(s): Manoj V Murhekar (ICMR-NIE, Chennai), Ganesh Kumar (ICMR-NIE, Chennai) , Tapas Chakma (NIRTH, Jabalpur), Sampada Dhayarkar (NARI, Pune)
Collaborating Institute(s): WHO, MoHFW, State governments, Vital Strategies – Resolve to Save lives
Funding Agency: Vital Strategies – Resolve to Save lives

Rationale and background

The Government of India (GOI) has adopted a national action plan for the prevention and control of non-communicable diseases (NCDs) with specific targets to be achieved by 2025. These include:

- 25% relative reduction in overall mortality from cardiovascular diseases
- 30% relative reduction in mean population intake of salt/sodium, and
- 25% relative reduction in the prevalence of raised blood pressure.

The National Health Mission (NHM) and its chronic disease program, the National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS), focuses on the achievement of these goals within the existing healthcare system. Recently, GOI has begun phasing in the universal screening of hypertension and diabetes as a component of comprehensive primary health care.

In India, nearly one-third of adults have hypertension, only one-fourth of the people with hypertension are aware of their condition, and only approximately 10% of those with hypertension have their blood pressure controlled. To meet the GOI target of a 25% relative reduction in the prevalence of raised blood pressure, approximately 4.5 crore patients with hypertension (45 million) patients among 18 crores with uncontrolled blood pressure need to achieve blood pressure control. (There are approximately 20 crore total patients with hypertension in the country, of whom approximately 2 crores have it under control). India Hypertension Management Initiative is a collaborative project of the MoHFW, State governments, ICMR and WHO to improve the quality of care for managing hypertension.

Objectives and strategies

The primary goal of this project is to reduce cardiovascular disease, particularly by improving the control of high blood pressure, a leading risk factor for cardiovascular disease, among adults in India. This is a 5-year project involving various partners. The implementation partners include Ministry of Health and Family Welfare, WHO, ICMR, Academic institutions and state governments. The international technical partner is Vital Strategies – Resolve to Save Lives". The project aims to strengthen the hypertension management in 100 districts where National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) is ongoing.

Goal: To achieve 25% reduction in the raised blood pressure in the project districts by end of 2022.

Overall Objective: Improve the management of hypertension by treating additional hypertension patients as per standard protocols and increase the proportion of hypertension control from an estimate of 10% to at least 30% at the community-wide level.

The project was initiated in November, 2017 and is currently ongoing in 5 states.

The project strategies include:

1. Use of standard drug- and dose-specific algorithms for hypertension management agreed upon by various stakeholders at the state level and consistent with national and global policies.
2. Ensured availability of drugs in the algorithm in all facilities either through the state or NPCDCS (National Health Mission) funds, with the provision of a starter set or buffer stock of medications.
3. Build capacity of program managers at state and district level for effective applied epidemiology and programme management.
4. Build capacity of all levels of staff for management of hypertension as appropriate at each level.
5. Ensure high-quality service delivery in all health facilities using various approaches such as documentation of visits in treatment card, BP monitoring in every visit, minimum 30-day drug prescription, counselling and access to free drugs, awareness regarding risks of uncontrolled hypertension etc.
6. Monitor activities related to decentralization of hypertension management by involving mid-level providers like AYUSH practitioners and Nurses for screening, referring to higher facilities and regular monitoring and maintaining treatment of blood pressure and Auxiliary Nurse Midwives/ ASHA to educate the patient and drug refills at the sub-centre level/ Health and Wellness Centers for patients diagnosed and initiated on hypertension treatment.
7. Monitoring systems with standard indicators and documentation mechanisms that ensure collection of data for the key monitoring indicators, mainly control rates.
8. Support for implementation science to promote continuous quality improvement, with the potential involvement of universities, health institutions, and private sector to facilitate the implementation of the above.

Ongoing activities in 25 districts and lessons learnt

In the first phase of the project, 25 districts from 5 states were drawn as directed by the Ministry of Health and Family Welfare from the 158 (initially 107) districts previously selected by the Government of India for intensified action for population-based screening.

- **Punjab [5]**: Bathinda, Gurdaspur, Hoshiarpur, Mansa, Pathankot
- **Madhya Pradesh [3]**: Bhopal, Chhindwara, Ratlam
- **Kerala [4]**: Kannoor, Thiruvananthapuram, Thrissur, Wayanad
- **Telangana [9]**: Karimnagar, Jagtiyal, Rajanna Siricilla, Pedapally, Jayashankar Bhupalpally, Warangal Urban, Warangal Rural, Jangaon, Mahboobabad

- **Maharashtra [4]**: Bhandara, Satara, Sindhudurg, Wardha

The activities were initiated in a phased manner in Punjab, Kerala and Madhya Pradesh since January 2018. Based on the experience in the first six months, several lessons were learnt which can be used for the scale up.

State level consensus workshops were held for finalizing the protocols with participation from state and national level experts. The final protocols were included in the training manuals developed for the project, and all the doctors were trained. Other staff such as nurses, pharmacist etc. were also trained for various components of the project.

Table : Achievements, lessons learnt in the first phase in Punjab, Kerala, Madhya Pradesh and prerequisites for scale up to other states.

	Achievement	Lessons learnt	Prerequisites for scale up
Drug/dosage specific protocol	• Protocol finalised in the State consensus meetings • State experts/doctors from district hospitals/CHC feel that Drug-specific protocols useful and simple	• Possible to achieve consensus • Insufficient number of patients treated 'til date to determine acceptability and effectiveness	Protocol options at the national level – Three drugs for management in primary care
Availability of adequate drugs as per protocol	• States willing for procurement as per protocols	• Inadequate medicines due to lack of forecasting and delay in procurements • Chlorthalidone not in EDL in most states/GOI and lack of rate contracts	Procurement of protocol medications
Blood pressure equipment	• Local procurement being done in many facilities after starting the project	• Lack of good quality monitors in most facilities • Many patients who enter health facilities do not get BP measured • Digital BP monitors yet to be widely accepted • Recording of BP inaccurately	Procurement of good quality BP monitors Training and re-training of staff for BP measurement
Human resources in health facilities	• NPCDCS staff available in the majority of the district hospitals and CHC - played a key role in operationalising the program	• NPCDCS staff either not recruited or diverted to other departments in many facilities • No dedicated staff in many health facilities, heavy workload of existing staff	The dedicated staff (either through NPCDCS or state regular staff) at facility level - District/CHC and PHC with a high patient load

				Capacity building of all cadres
Patient flow and team-based care	• Patient flow streamlined in some facilities to ensure all patients have BP checked and card entry made by the nurse	• Non-implementation of opportunistic screening in many NCD clinics • Poor coordination between staff in NCD clinic and doctors – not all patients seen by NCD nurse	Optimize patient flow to ensure BP screening of at least all patients over age 30 and appropriate management of all with elevated BP.
Patient-centred care	• An order issued for 30-day prescription and implemented in most project districts	• Decentralization to provide medicines at a sub-center level for patients with controlled BP - yet to be operationalized	Community-based approaches involving health workers, with telemedicine support where feasible
Patient monitoring systems	• Acceptance of tools by service providers – Patient card at the facility level and longitudinal (cohort) register • High patient satisfaction	• Need to develop systems for storage and retrieval of cards • High rates of default (>60% in many centers) • Non-involvement of ASHA and ANM for care	Monitoring systems - cohort monitoring and a mechanism to recall dropouts
Overall monitoring and supervision	• Additional manpower: CVHO and STS visit all health facilities in rotation- essential for effective program management • Feedback is given to medical officer/district and state officials • Better visibility of NCD program	• Lack of ongoing field supervision under NPCDCS, therefore NCD activities not periodically reviewed in the districts • A low priority in the district- and state-level reviews	Supervision and reviews - Consultants (1 per 1-2 districts)/ Treatment supervisors (1-2/district)

Sample protocol

Government of Kerala

Hypertension Protocol

Screen **all adults** over 18 years.

High BP: **SBP > 140** or **DBP > 90** mmHg

Step 1

If BP is high

Check S. Creatinine and Urine Protein

Start on lifestyle modifications for 3 months. Review every month.

If BP is high at monthly review, start on drug treatment

Step 2

Review in 3 months. If BP is high

***Start* Amlodipine 5mg (CCB)**

Step 3

Review in 1 month. If BP is high

***Add* Telmisartan 40mg (ARB)**

Along with Amlodipine 5mg

Step 4

Review in 1 month. If BP is high

***Intensify* Telmisartan to 80mg**

Along with Amlodipine 5mg

Step 5

Review in 1 month. If BP is high

***Intensify* Amlodipine to 10mg**

Along with Telmisartan 80mg

Step 6

Review in 1 month. If BP is high

***Add* Chlorthalidone 12.5mg (diuretic)**

Along with Amlodipine 10mg and Telmisartan 80mg

...

Review in 1 month. If BP is high

Confirm **compliance** to treatment. If confirmed, **refer** to specialist.

Blood pressure measurements

At least 2 readings at an interval of 2 minutes. If readings differ by more than 5mm Hg, take a third reading. The lower of the readings should be taken as the representative SBP and DBP.

If SBP ≥ 180 and/or DBP ≥ 110
Refer immediately to higher centre after starting treatment.

If SBP ≥ 160-179 and/or DBP ≥ 100-109
- Do basic investigations: ECG, S creatinine.
- Start on lifestyle modif cations.
- Start drug treatment.

If SBP ≥ 140-159 and/or DBP ≥ 90-99
Start on lifestyle modif cations.

Measuring blood pressure

- Use a mercury sphygmomanometer or electronic digital oscillometric device that is validated using a standard protocol and calibrated regularly.
- Patient should relax for 5 minutes before measurement.
- Patient should not have had caffeine in the past hour or smoked in the past 30 minutes.
- Patient should be seated comfortably with back supported, arm at heart level, and legs uncrossed.
- Appropriate cuff size: length of bladder 80% of arm circumference, width 40% of arm circumference.

Lifestyle modification

All patients require lifetime lifestyle modification.

Change diet
Salt restricted (<5g/day), low-fat diet.

Reduce weight
Target BMI 18.5 - 22.9 kg/m2

Regular exercise
Moderate intensity, 30 minutes, 5 days a week

Alcohol and Smoking
Avoid unhealthy intake of alcohol. Stop smoking.

India Hypertension Management Initiative: Kerala 1.00-6-7

2. CONGENITAL RUBELLA SYNDROME SURVEILLANCE IN INDIA

Coordinating institutes

1. ICMR-National Institute of Epidemiology, Chennai
2. ICMR-National Institute of Virology, Pune

Collaborating Institute(s)

1. All India Institute of Medical Sciences, Jodhpur
2. Christian Medical College, Vellore
3. Indira Gandhi Institute of Child Health, Bangalore
4. Post Graduate Institute of Medical Education and Research, Chandigarh.
5. KEM Hospital, Pune

Funding Agency: UNDP

Rationale: Government of India is committed to eliminate measles and control rubella/congenital rubella syndrome (CRS) by 2020. In 2017, India introduced measles-rubella (MR) vaccine nationwide and launched a mass vaccination campaign targeting children aged 9 months to 14 years in five of the country's 29 states and seven union territories, with plans to expand the campaign to the remaining states in a phased manner. Although surveillance for measles and rubella is ongoing in the country, India does not have a systematic surveillance system for CRS. To address this gap, the Indian Council of Medical Research and the Ministry of Health and Family Welfare, Government of India, initiated laboratory supported surveillance for CRS in six sentinel sites in five Indian states in November and December 2016.

Objective

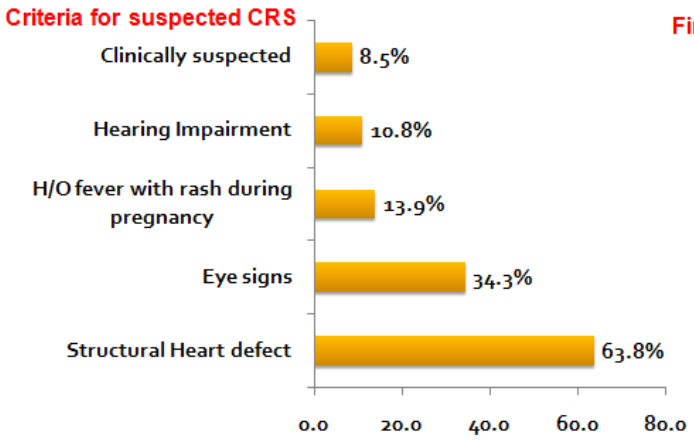
To establish a facility-based surveillance for CRS in selected medical colleges/hospitals in different parts of country to estimate the disease burden and monitor the time trends of the disease.

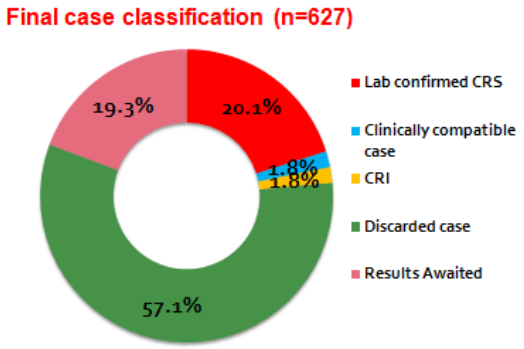
Methods

CRS surveillance is focused on identifying suspected CRS cases among infants aged 0–11 months who are attending pediatrics, ear nose and throat (ENT), ophthalmology, and cardiology Outpatient Departments (OPDs) of the sentinel hospitals. Suspected CRS cases are also identified during the routine newborn clinical examination of babies born at the sentinel sites. Based on the case definitions, adapted from WHO-recommended standards for CRS surveillance, all infants with suspected CRS are referred to the site surveillance coordinator (a pediatrician) for a complete physical examination. From every suspected CRS case, information about clinical and epidemiological details are collected and 1-mL blood sample is collected from the infant. Serum is tested for immunoglobulin M (IgM) and IgG antibodies against rubella using a commercial Enzyme linked Immunosorbent Assay (ELISA) (Euroimmun, Luebeck, Germany). All IgM-positive and IgG-positive sera and 10% of those that are negative are retested at the National Institute of Virology in Pune. All infants aged <6 months at the time of enrollment have oropharyngeal swabs collected and transported to National Institute of Virology for reverse transcription–polymerase chain reaction (RT-PCR) testing and genotyping.

Results

Six surveillance sites enrolled 627 suspected CRS patients so far (till 09th Nov 2018). The suspected CRS patients met one or more criteria of suspected CRS as shown in below figure. Most (44.7%) of the suspected CRS patients were aged between 1-5 months. The final classification of suspected CRS patients, based on IgM and IgG serology and clinical details is presented in below figure. So far 257 samples have been tested by RT-PCR and 36 (14.0%) were found to be positive. 36 out of 257 samples (14%) tested for O-P swabs so far, were positive by RT PCR.





3. INDIAN NETWORK OF POPULATION-BASED SURVEILLANCE PLATFORM FOR INFLUENZA AND OTHER RESPIRATORY VIRUSES AMONG ELDERLY (INSPIRE)

Principal Investigator: R. Prabu
Co-Investigator(s): CP Girish Kumar, J. Yuvaraj
Collaborating Institute(s): AIIMS, New Delhi, NIV, Pune, NICED, Kolkata
Funding Agency: US Centres for Disease Control and Prevention Atlanta, US

Rationale

Influenza associated acute respiratory infection is a major cause for morbidity and mortality among elderly population. There is a paucity of data on burden of Influenza associated ARI among elderly in India, which is essential for providing necessary inputs for policy makers for implementing appropriate vaccination programmes. This study will provide data on incidence rate, seasonal variability, risk factors of influenza associated ARI and associated economic burden.

Background

Older adults (aged 60 years or above) account for 8% of total population in India (2011). This proportion is projected to reach 19% by the year 2050. Influenza associated ARI is an important cause for high mortality and morbidity among elderly. However there is paucity of literature related to this problem. The available reports are from facility based or limited to small population, which might underestimate the true burden. Hence, it is important to estimate the burden of infections with influenza and other respiratory

viruses in this vulnerable age group through a population-based cohort study is necessary. ICMR-NIE is conducting a multi-centric study led by AIIMS, New Delhi with the following objectives.

Objectives

Phase I:

i. To **establish a network of population-based surveillance platforms** for on-going surveillance of influenza and other respiratory viruses among elderly (aged 60 years or more) in four regions of India to determine circulating influenza and other respiratory viruses strains of epidemic concern from the community
ii. To **demonstrate feasibility of providing real-time population-based data** on circulating influenza and other respiratory viruses strain through use of portable/mobile electronic devices for data collection and sharing

Phase II:

iii. To estimate the incidence of influenza- and RSV- associated acute respiratory infections (both upper and lower), outpatient clinic visits and hospitalizations among a community dwelling cohort of older adults (>60 years)
iv. To describe the risk factors for influenza- and RSV-associated ALRI, hospitalization, ICU admission and mortality among older adults
v. To estimate the annual cost of influenza associated acute respiratory infections among older adults in India from the societal perspective
vi. To estimate the effect of influenza and RSV infection on frailty and cognition among a community dwelling cohort of older adults

Methods

The households in the study area were mapped by the field staff by house to house visit. The households with the elderly persons aged 60 years and above were identified. We obtained written informed consent from the potential participants before enrollment. The staff nurses undertake weekly ARI surveillance using standardized tools and collect nasal/throat swabs from the persons suffering from ARI. We collect data using Tablet computers with pre-structured questionnaire designed and programmed in Open Data Kit 1 (ODK 1). In phase II, in addition to incidence of ARI and we collect data on economic burden due to ARI, burden of the illness due to hospitalizations, effect of ARI frailty index and risk factor, are also being collected. The samples are being tested as per the CDC protocol in NIE Laboratory. For external QC we send 5% samples to AIIMS, New Delhi.

Results

Phase I: We recruited a total of 1130 elderly population in the study area. We conducted the surveillance between January and May 2018. The average incidence rate of ARI was 7%. We collected 336 nasal/throat swabs from the participants and influenza was positive among 6 patients (2%; Influenza A [H3-1] - 1, Influenza B [Yam-2, Vic -3] - 5) of the ARI patients. The incidence of influenza was 1.7 per 1000 person weeks.

Phase -II: We recruited 1562 elderly population. We started of ARI surveillance in August 2018. Till date we have conducted 16 weeks of surveillance. The average incidence rate of ARI was 3.7% and influenza incidence rate was 7.85% (0.6 per 1000 person weeks; Influenza A [H1N1] - 4).

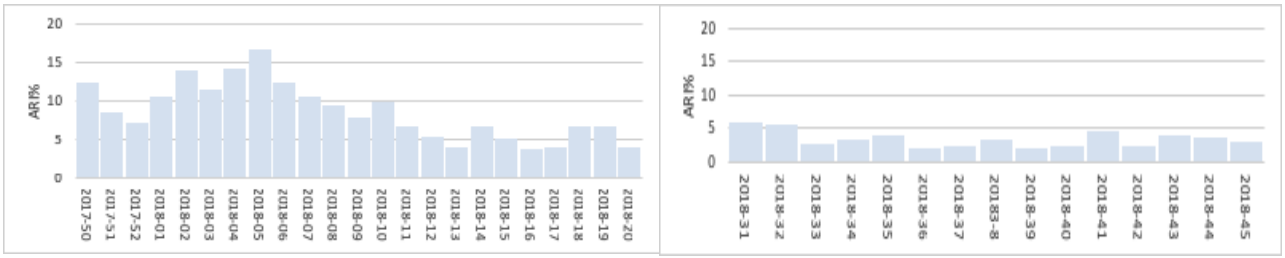


Figure. Weekly ARI rate – Phase I and Phase-2

4. INTEGRATED ROAD TRAFFIC INJURY SURVEILLANCE SYSTEM (IRIS) CHENNAI, TAMIL NADU

Principal Investigator: P. Manickam
Co-Investigator(s): P. Ganeshkumar, T.Jeromie Wesley Vivian, K Kanagasabai, T Daniel Rajasekar, Saravanakumar V, Jasmine Sundar, Gitakrishnan Ramadurai, PV Jayasankar, K Jayanthi, Ajay Prasad, Rajesh V
Collaborating Institute(s): A collaborative study of ICMR-National Institute of Epidemiology (NIE), Indian Institute of Technology-IIT Madras, The Tamil Nadu Dr.MGR Medical University, Rajiv Gandhi Government General Hospital (RGGGH) and Sundaram Medical Foundation (SMF)
Funding Agency: Indian Council of Medical Research (ICMR)

Rationale

Evidence suggests that hospital-based injury surveillance for Road Traffic accidents (RTAs) is useful in the International [Canadian Hospitals Injury Reporting and Prevention Program] and in the Indian context [Bengaluru Road traffic injury/injury surveillance programme, involving mostly private hospitals]. However, such surveillance has not been established in Chennai city. Such system may be useful to characterize epidemiological and clinical patterns along with the management and clinical outcomes. It will help in calculating better estimates of magnitude of Road Traffic Injuries (RTIs) and will facilitate identification of priorities for intervention, clinical management and facilitate developing appropriate guidelines and strategies. The proposed surveillance system may contribute to development of unified digital surveillance information system and potential expansion to DHR supported multi-disciplinary research units located in medical colleges in Tamil Nadu.

Background

Globally, injuries are the leading cause of hospitalizations, causing more than five million deaths annually. According to 2015 Global Burden of Disease, RTAs moved up in the ranking as a major cause of death from 1990 to 2015 in India. According to India's National Crime Records Bureau, RTAs accounted for 39% among deaths due to unnatural

causes in 2014. Tamil Nadu accounted for 10% of total accidental deaths in India in 2014. RTAs (n=79,801) accounted for 98% of the total traffic accidents reported from 53 mega cities during 2014. Chennai, the capital city of Tamil Nadu, topped 53 mega cities with 12% and ranked second in terms of proportion of all the reported fatal accidents.

Objectives

- Describe data sources, systems and quality for RTIs
- Characterize nature, types, distribution & pattern of RTIs
- Describe clinical management and outcomes of treatment of hospitalized RTIs
- Document RTIs using Haddon's matrix
- Describe factors associated with fatal RTIs

Methods

Hospital-based surveillance is ongoing at Rajiv Gandhi Govt. General Hospital (public sector) and SMF hospital (private sector). Trained nurse investigators use tablet-based data collection tool (designed on the basis of WHO surveillance tool for RTIs) to collect data [Personal identifier, Socio-demographic, Accident identification (Site, weather, climate and light conditions), Road, Vehicle, Person related data, Pre-hospital admission, Ambulance, Clinical, Treatment and Outcome details] through a combination of interview of patients or their respondents and abstraction of information from hospital records. The information at the community level is proposed to be collected from key informants every two-weeks from a population of 10,000 served by a health sub-centre facility.

Results

- **Surveillance tools development:** Study tools for situational analysis, surveillance in public health facility, surveillance in private health facility and surveillance in community were developed by ICMR-NIE.
- **Data collection application development:** An Android application for data collection was developed by FHTS and is used in the field for surveillance.
- **Meetings and workshops:** We had meeting of the co-investigators, collaborators and stakeholders. We attended workshops to finalize tools and formalize collaborations with Tamil Nadu Accident and Emergency Care Initiative (TAEI) of NHM. The study was presented to IEC of Madras Medical College for conduct at RGGGH.
- **Surveillance sites:**

Type	Site specifications	Study sites
Public	Tertiary care facility (District hospital/Trauma care center/medical college hospital)	Rajiv Gandhi Government General Hospital
Private	Private hospital offering RTI services	Sundaram Medical Foundation Dr.Rangarajan Memorial Hospital (SMFH)
Community	10,000 population attached to a health facility	Ayappakkam service area

5. HIV SENTINEL SURVEILLANCE AMONG HIGH-RISK GROUPS

Principal Investigator: A. Elangovan
Co-Investigator(s): B. Ganesh, Scientist-D
Collaborating Institute(s): State AIDS Control Societies (SACS) of respective states
Funding Agency: NACO

Rationale
Estimating HIV infection among various Risk groups is very essential in achieving zero infection of HIV/AIDS in India.

Background
HIV sentinel surveillance under taken by National AIDS Control Organization (NACO) is an ongoing systematic collection, collation, analysis and interpretation of data periodically, which helps to calculate HIV disease burden in the country and to take appropriate action within stipulated time. NIE is identified as Regional Institute to conduct HIV surveillance for 8 southern states (Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Kerala, Orissa, Pondicherry and Lakshadweep). Key populations at the HIV sentinel surveillance centers are considered in the age group of 15-49 years. The HIV sentinel surveillance is being implemented and supervised by NIE in 8 Southern states since 2006.

Objectives
Generate data to improve tracking of HIV trends as well as to understand the epidemic's characteristics and its level of proliferation among various High Risk Group populations across the geographical areas of India.

Methods
In the current round of surveillance, a total of 45032 blood samples were collected from 183 sites across the states of Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Kerala, Orissa and Pondicherry.

Results: The prevalence rates are given in the following table.

HIV Sentinel Surveillance, HRG, 2016-17				
State	Typology	Tested	Positive	Prevalence (%)
Andhra Pradesh	FSW	3250	13	0.40
Andhra Pradesh	IDU	500	3	0.60
Andhra Pradesh	LDT	500	3	0.60
Andhra Pradesh	MSM	1250	5	0.40
Andhra Pradesh	SMM	750	3	0.40
Andhra Pradesh	TG	236	1	0.42
Karnataka	FSW	5973	25	0.42
Karnataka	IDU	250	1	0.40
Karnataka	LDT	250	1	0.40

Karnataka	MSM	2498	10	0.40
Karnataka	SMM	500	2	0.40
Karnataka	TG	500	2	0.40
Kerala	FSW	2262	10	0.44
Kerala	IDU	726	3	0.41
Kerala	LDT	250	1	0.40
Kerala	MSM	1861	8	0.43
Kerala	SMM	500	2	0.40
Kerala	TG	613	3	0.49
Orissa	FSW	2746	13	0.47
Orissa	IDU	1000	4	0.40
Orissa	LDT	250	1	0.40
Orissa	MSM	250	6	2.40
Orissa	SMM	250	1	0.40
Orissa	TG	728	3	0.41
Pondicherry	FSW	750	3	0.40
Pondicherry	MSM	500	2	0.40
Tamil Nadu	FSW	6000	27	0.45
Tamil Nadu	LDT	500	2	0.40
Tamil Nadu	MSM	3740	16	0.43
Tamil Nadu	SMM	500	3	0.60
Tamil Nadu	TG	250	2	0.80
Telangana	FSW	2996	15	0.50
Telangana	IDU	250	1	0.40
Telangana	LDT	500	2	0.40
Telangana	MSM	741	4	0.54
Telangana	SMM	211	1	0.47
Telangana	TG	201	1	0.50

6. INTEGRATED BIOLOGICAL AND BEHAVIORAL SURVEILLANCE (IBBS)

Principal Investigator: A. Elangovan
Collaborating Institute(s): State AIDS Control Societies (SACS) of respective states
Funding Agency: NACO

Background

Integrated Biological and Behavioral Surveillance (IBBS) under taken by National AIDS Control Organization (NACO) is an ongoing systematic collection, collation, analysis and interpretation of data periodically, which helps to calculate HIV disease burden in the country and to take appropriate action within stipulated time. Key populations at the soliciting sites are considered in the age group of 15-49 years. NIE is identified as Regional

Institute to conduct HIV surveillance for 8 southern states (Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Kerala, Orissa, Pondicherry and Lakshadweep). The HIV sentinel surveillance is being implemented and supervised by NIE in Southern states since 2006.

Objectives

HIV sentinel surveillance generates data to improve tracking of HIV trends as well as to understand the epidemic's characteristics and its level of proliferation among various Risk Groups across the geographical areas of India.

Methods

In the current round of surveillance, a total of 18635 blood samples were collected from 42 sites across the states of Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Kerala, Orissa and Pondicherry.

Results: The prevalence rates are shown in the following table.

Integrated Biological and Behavioral Surveillance, HRG, 2014-15					
State	Typology	Domain Name	Tested	Positive	%
Andhra Pradesh	FSW	Nellore	379	2	0.53
Andhra Pradesh	FSW	Adilabad	350	8	2.29
Andhra Pradesh	FSW	Chittoor	391	15	3.84
Andhra Pradesh	FSW	Guntur	367	28	7.63
Andhra Pradesh	FSW	Mahabubnagar	389	50	12.85
Andhra Pradesh	IDU	Nellore	380	9	2.37
Andhra Pradesh	IDU	Hyderabad	391	16	4.09
Andhra Pradesh	MIG	Hyderabad	767	3	0.39
Andhra Pradesh	MIG	Chittoor	1130	19	1.68
Andhra Pradesh	MIG	Krishna	976	29	2.97
Andhra Pradesh	MSM	East Godavari	396	20	5.05
Andhra Pradesh	MSM	Anantapur	326	31	9.51
Andhra Pradesh	MSM	Guntur	386	43	11.14
Andhra Pradesh	MSM	Warangal	388	66	17.01
Andhra Pradesh	TG	Krishna	354	21	5.93
Andhra Pradesh	TG	Hyderabad	303	30	9.90
Kerala	FSW	Pathanamthitta	401	0	0.00
Kerala	FSW	Kozhikode	332	2	0.60
Kerala	FSW	Thrissur	142	3	2.11
Kerala	IDU	Alappuzha	405	0	0.00
Kerala	IDU	Kozhikode	395	0	0.00
Kerala	IDU	Ernakulam	388	3	0.77
Kerala	MIG	Ernakulam	963	3	0.31
Kerala	MIG	Trivandrum	583	2	0.34

Kerala	MSM	Kasargode	389	0	0.00
Kerala	MSM	Kollam	320	4	1.25
Kerala	MSM	Ernakulam	350	7	2.00
Kerala	TG	Kollam	246	6	2.44
Puducherry	FSW	Pondicherry	391	4	1.02
Puducherry	MSM	Pondicherry	378	9	2.38
Tamil Nadu	FSW	Chennai	381	1	0.26
Tamil Nadu	FSW	Thiruvarur	356	2	0.56
Tamil Nadu	FSW	Erode	364	7	1.92
Tamil Nadu	FSW	Madurai	387	8	2.07
Tamil Nadu	MIG	Tiruppur	1184	0	0.00
Tamil Nadu	MSM	Sivaganga	400	1	0.25
Tamil Nadu	MSM	Tiruvannamalai	385	7	1.82
Tamil Nadu	MSM	Namakkal	329	6	1.82
Tamil Nadu	MSM	Thanjavur	379	14	3.69
Tamil Nadu	MSM	Dindigul	358	33	9.22
Tamil Nadu	TG	Coimbatore	388	9	2.32
Tamil Nadu	TG	Chennai	368	22	5.98

7. ROTAVIRUS VACCINE IMPACT ASSESSMENT STUDY

Principal Investigator at NIE: CP Girish Kumar
Co-Investigator(s): S. Venkatasubramanian
Collaborating Institute(s): Christian Medical College, Vellore; Institute of Child Health and Hospital for Children, Chennai
Funding Agency: CDC Foundation (Grant recipient- CMC)

Background

Rotavirus is the most common cause of severe, dehydrating acute gastroenteritis (AGE) among children under-five years of age in India, causing an estimate 11.37 million illnesses, 3.27 million outpatient visits and 872,000 inpatient admissions each year and resulting in Rs 10.37 billion each year in direct costs. An indigenous Rotavirus Vaccine ROTAVAC, based on a neonatal rotavirus strain (116E), recently completed a successful Phase III clinical trial in which 3 vaccine doses given at 6, 10, 14 weeks of age were 56% effective against severe rotavirus AGE. ROTAVAC has been licensed in India and in 2014, the Government of India recommended inclusion of rotavirus vaccine into the Universal Immunization Programme (UIP) of India. Rollout of ROTAVAC, in a phased manner, from 2016. This project will generate data on effectiveness and impact of rotavirus vaccines through UIP in early introducing regions of India and will establish a sentinel site-based platform for assessment of safety of the vaccine with respect to intussusception.

Objectives

A. Acute gastroenteritis surveillance

- To identify cases of rotavirus among children less than five years of age hospitalized for AGE and to determine the circulating rotavirus genotypes pre- and post-introduction of ROTAVAC using sentinel hospital surveillance sites
- To measure changes in attendance rates of all-cause AGE and severity of presentations at the sentinel surveillance sites pre- and post-introduction of ROTAVAC
- To determine the effectiveness of a completed series of ROTAVAC against laboratory confirmed severe, rotavirus AGE under conditions of routine use in India, using existing sentinel hospital surveillance sites and case-control methods. Additional secondary objectives of the case-control study include:
    - Determination of vaccine effectiveness against specific rotavirus genotypes
    - Determination of vaccine effectiveness of a partial series of ROTAVAC
    - Determine potential waning of ROTAVAC effectiveness during the stud period
- To implement surveillance for intussusception in a network of pediatric hospitals in India

B. Intussusception surveillance

Primary

- To describe the epidemiology (e.g., age distribution and seasonal patterns) of intussusception hospitalizations among children <2 years of age.

Secondary

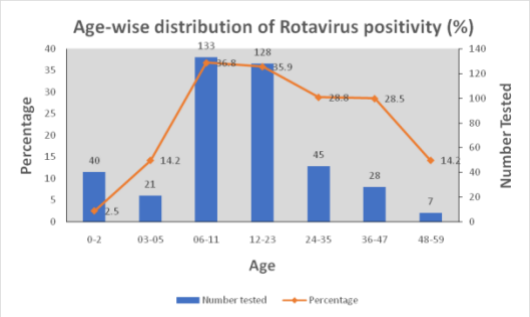
- To determine the proportion of intussusception-associated hospitalizations that requires surgical treatment.
- To determine the proportion of intussusception-associated hospitalizations that result in death.
- To describe potential infectious etiologies of intussusception by assessing for infectious pathogens in stool samples from intussusception cases and matched controls without intussusception.

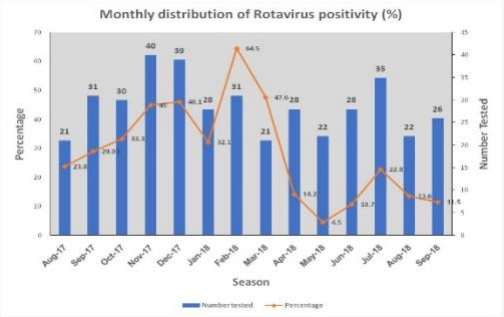
Methods

This is a multi-centric vaccine impact surveillance project involving sentinel sites which will each have in-patient facilities submitting clinical data and samples for rotavirus testing and characterization. All children less than 5 years of age admitted with acute diarrhea will be enrolled after obtaining informed and written consent from parent/guardian. Clinical information and a stool specimen will be obtained. Stool samples will be tested for presence of rotavirus by ELISA and characterization by PCR. For intussusceptions surveillance, intussusceptions cases and controls (non-intussusceptions, non-infectious hospitalized patients) who age, gender and location matched will be enrolled. Surveillance staff will complete a control case report form, including limited information on demographics, diagnosis, and discharge date as well as collect a stool specimen. Data management will be carried out centrally by CMC, Vellore.

Results

During the period August 2017-September 2018, 474 eligible cases of children under 5 years of age with AGE were enrolled. Stool samples from 402 cases were available for testing and 30.1% were positive for rotavirus. The highest positivity (36.8%) was observed among children between 6-11 months followed by 12 and 23 months of age (35.9%). Rotavirus positivity was higher during cooler months and decreased positivity was seen during 2018 in comparison to the same period during 2017. Analysis of distribution of various rotavirus genotypes showed the preponderance of G3P[8] strains (69.4%) followed by G1P[8] strains (13.2%). None of the positive cases had the vaccine strain type *i.e.* G9P[11]. Fifty intussusceptions cases and 24 controls were enrolled during the reporting period. Stool specimen from only one intussusceptions case was positive for rotavirus (G3P[8]).





8. IN-COUNTRY DATA VERIFICATION EXERCISE FOR ELIMINATION OF MOTHER TO CHILD TRANSMISSION OF HIV AND SYPHILIS IN INDIA

Principal Investigator: Tarun Bhatnagar
Collaborating Institute(s): National AIDS Control Organization
Funding Agency: UNICEF

Background

Prevention of Parent to Child Transmission (PPTCT) of HIV has remained the mainstay of the National AIDS Control Program (NACP). Notwithstanding progress, 2012 was a pivotal year when India strongly committed to building on achievements made over the previous decade and advance towards the goal of Elimination of Mother to Child Transmission of HIV and congenital Syphilis. Program data indicate that different states are at varying levels in terms of progress towards EMTCT. While certain states have made significant progress, others need to catch-up.

Rationale

To garner national level momentum - and in the run-up towards achieving EMTCT of HIV and congenital Syphilis in India—NACO's Technical Resource Group (TRG) on PPTCT, during December2016, recommended launch of the sub-national pre-verification exercise in a phased approach. The TRG constituted the National Core Group (NCG) on EMTCT. The TRG and NCG recommended launch of the data-verification exercise under a phased approach with a focus on the following six states: Andhra Pradesh, Karnataka, Maharashtra, Tamil

Nadu, Telangana and Mizoram. The reason these six states were shortlisted was because of the progress they had made in advancing towards key EMTCT process indicators.

Objectives

1. Review the data quality of the EMTCT process indicators
2. Review the process of data generation, compilation & reporting of EMTCT indicators, at facility level

Methods

The methods included both desk review of the program data, and fieldwork. Field work was conducted during August and September 2017 by District Implementation Teams (DIT) in the following districts which were selected based on highest and lowest institutional delivery rates in the state: Guntur and Visakhapatnam in Andhra Pradesh, Bengaluru and Shimoga in Karnataka, Nagpur and Wardha in Maharashtra, Aizawl and Mamit in Mizoram, Hyderabad and Khammam in Telangana, and Chennai and Villupuram in Tamil Nadu. Data verification focused on 10 EMTCT process indicators: number of new ANC registration, pregnant women tested for HIV at the ANC and at the time of delivery, HIV positive pregnant women initiated on treatment, HIV exposed babies t ested at 18 months, HIV positive babies detected at 18 months, pregnant women tested for syphilis, RPR/VDRL test found reactive, Syphilis positive pregnant women treated for STI, and number of babies reported with congenital Syphilis. The reference period for the desk review was 2015-16 and 2016-17 while for the fieldwork, the DITs reviewed reports and records for two months (June 2015 and December 2016) in selected facilities in each district. The following data quality aspects were reviewed: reporting status of the unit, completeness of reporting for the above-mentioned indicators, consistency of reporting over time with no outliers, the correctness of reporting and recording, and duplication of the number of pregnant women tested for HIV. Tailor-made tools supported the collation and analysis of the data.

Fig: Six Phase 1 states for EMTCT data verification

Results

Health facilities had different systems in place for managing the new ANC registrations. Usually there was no separate register for old and new cases at health facilities at the district and higher level, which posed a challenge for correctly estimating the services provided to new case, coupled with lack of clarity in the documentation for 'ANC registration' versus 'ANC service delivery'. Reporting in the ANC registers and ICTC registers rarely matched. Regarding the data on other HIV indicators maintained within the ICTC, a high level of quality was found across all facilities, with few exceptions. Overall, there was high consistency in the data between the facility-level registers and SIMS reports. Analysis of the data by type of reporting unit found high reporting status and consistency over time, particularly in Stand Alone ICTC and ART centres. However,

the reporting status of Facility Integrated ICTCs (F-ICTCs) and DSRC had scope for further improvement.

Recommendations

- Better clarity on the recording and reporting of new ANC registrations can be provided under NHM and HMIS in order to avoid duplication and improve the quality of data.
- SIMS need not duplicate the effort and report on the indicator 'ANC registrations'. Instead, data on ANC registrations from HMIS data can be considered.
- It is critical to consider the option to report repeat testing of pregnant women in SIMS ICTC to differentiate between tests performed and number of people tested.
- Documentation of Syphilis indicators needs to be strengthened uniformly across all levels of ANC care along with training of facility staff and rigorous review mechanism.

9. A MULTICENTRIC STUDY TO ESTIMATE THE SERO PREVALENCE OF DENGUE VIRUS INFECTION IN INDIA

Coordinating institute: ICMR-National Institute of Epidemiology, Chennai
Collaborating Institute(s):

1. ICMR-National Institute of Epidemiology, Chennai
2. ICMR-Desert Medical Research Centre, Jodhpur
3. ICMR-National Institute of Cholera and Enteric Diseases, Kolkata
4. ICMR-National Institute of Malaria Research, New Delhi
5. ICMR-National Institute of Traditional Medicine, Belagavi
6. ICMR-National Institute of Research in Tribal Health, Jabalpur
7. ICMR-National Institute of Virology, Pune
8. ICMR- Regional Medical Research Centre, Bhubaneswar
9. ICMR- Regional Medical Research Centre for NE, Dibrugarh
10. ICMR-Rajendra Memorial Research Institute of Medical Sciences, Patna
11. King George Medical University, Lucknow
12. Postgraduate Institute of Medical Education and Research, Chandigarh
13. SHARE India, Hyderabad

Funding Agency: Indian Council of Medical Research

Background & Rationale

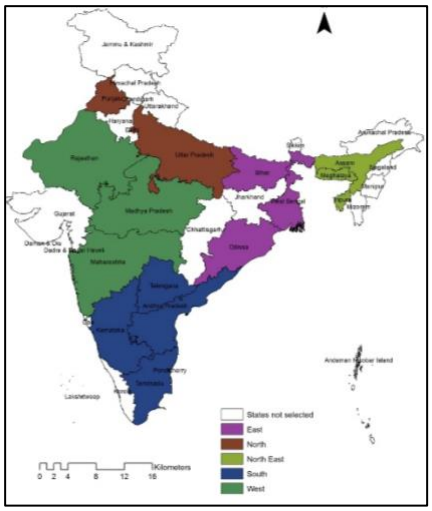
Dengue is a major public health problem in India. Recently, dengue vaccine developed by Sanofi Pasteur has been licensed for use in many countries, while several vaccine candidates are in the process of development. Information about endemicity of dengue infection is crucial before taking a decision about introduction of dengue vaccine. With this background, the National Institute of Epidemiology, is conducting a multi centric nationwide cross sectional survey among individuals aged 5-45 years to estimate the age-specific sero-prevalence.

Objectives

To estimate the age-specific sero-prevalence of dengue virus infection in India.

Methods

The study is aimed to estimate the seroprevalence of dengue into five geographic regions: North, Northeast, East, West and South. From each region, three states were selected randomly and from each selected state, four districts were selected by population proportionate to size method. From each selected district two villages from rural areas and two wards from urban areas were selected randomly. From the selected village/ward, one Census Enumeration Block (CEB) was selected by SRS. The survey team uses the census location map to identify the boundaries of the CEB. If the maps are not available, the survey teams create a rough map of the CEB. CEBs having more than 200 households were segmented with each segment having 100 households approximately, then one segment is randomly selected. All the households in the given segment are enumerated. The survey is carried out in three age groups: 5-8, 9-17 and 18-45 years. A total of 2640 sample is planned for each age group at national level; hence a total of 7920 sample for all the three age groups. The list of all persons in each of the three age-groups would form the sampling frame for selecting 25 persons in each age group by simple random sampling. All the selected persons were visited in their houses and 3 to 5 ml blood sample was collected after obtaining written informed consent/assent. Blood samples are being be tested for IgG antibodies against dengue, Chikungunya and Japanese Encephalitis.



States selected for survey

Results

The Survey is completed in all 15 states. A total of 12300 samples were collected and are being tested for IgG antibodies against dengue, JE and Chikungunya. A subset of 500 samples are being tested for PRNT at NIV, Pune. Samples are being tested for other viral pathogens like JE and chikungunya.

10. SOCIO-BEHAVIOURAL ISSUES AND STRUCTURAL FACTORS REGARDING HEALTH OF UNDER-5 CHILDREN IN URBAN SLUM POPULATION OF CHENNAI, TAMIL NADU

Principal Investigator: P. Ganeshkumar
Co-investigator(s): P. Kamaraj, Yuvaraj Jayaraman, P. Manickam, K.Sathyamurthi (MSSW)
Collaborating institute: Madras School of Social Work, Chennai
Funding agency: Indian Council of Medical Research and Indian Council of Social Science Research, New Delhi

Background

Under-5 mortality was 2.5 times higher in the slums than urban regions in developing countries where the health indicators/determinants are also poorly addressed. India has made major strides in addressing those determinants in order to improve the health outcomes of under-5 children. In this context, this study was designed with an aim of identifying the

socio-behavioral and structural factors regarding the health of under-5 children in urban slum population of Chennai city.

Rationale

Despite the great strides made, India is lagging behind in achieving MDGs of reducing the under-5 mortality to the expected level by 2015. Towards achieving the goals, the GoI has launched National Urban Health Mission (NUHM) in 2015 so as to improve the health needs of urban poor by addressing the gaps and constraints in healthcare delivery system. Addressing the health indicators of under-5 slum population can significantly results favourable health outcomes and thereby helps to accomplish the expected outcomes of NUHM.

Objectives

The main objectives of the study are as follows:

a) To describe the socio- behavioural issues related to the health of under-5 children in urban slum population of Chennai.
b) To describe the structural factors related to the health of under-5 children in urban slum population of Chennai.

Methods

For this study, a mixed study design (Quantitative and Qualitative) was adopted. The overall identified slum list was collected from the Chennai Corporation and in which about 40 slums were selected by Probability Proportional to Size Systematic Sampling method based on population size of under-5 children of the slum as size. The selected slums were then categorized into North, Central and South Chennai based on administrative divisions of Chennai. Sample size was estimated based on the prevalence of health seeking behavior as an indicator of the behavioral factor related to health of under-5children. The sample size is 240 (40 slums X 6 under-5 children). For qualitative study, about three slums from each category and a total of nine slums were selected. In those selected slums, about nine FGDs, 18 in-depth interviews with primary caregivers and 6 in-depth interviews with institutional caregivers, nine transect walk and social mapping was conducted.

The through validation of entire data (233) is under process for any inconsistencies. The validated data will be analyzed using complex sample weighted analysis after adjusting the weight for non-response using Statistical software STATA 13.0. The proportion of adequate/appropriate health seeking behavior for under-5 children along with 95% confidence interval will be calculated based on sampling weight adjusted for non-response. The proportion of health utilization behavior, breastfeeding and complementary feeding practices, immunization, maternal health practices and malnourishment of under-5 will be calculated using sampling weight. The mean with standard deviations will also be calculated for anthropometric measures of under-5 children using sampling weight. The thematic analysis will be done for the collected qualitative data. Data description and interpretation will be done after the analysis using comprehensive triangulation method.

Results

Since the data collection was completed in the last week of July 2018, the quantitative data is under validation and the qualitative data are in the process of transcription and translation.

11. SURVEILLANCE DURING MASS GATHERINGS, TAMIL NADU

Principal Investigator: P. Manickam (ICMR-NIE)
Co-Investigator(s): NIE: Ganeshkumar P, MV Murhekar, T Jeromie; DPHPM, Tamil Nadu: K. Kolanda Swamy, GK Durairaj, B Premkumar, B Viduthalai Virumbi
Collaborating Institute(s): A collaborative study of ICMR-NIE and Tamil Nadu Directorate of Public Health and Preventive Medicine
Study period: ongoing
Funding agency: Indian Council of Medical Research (ICMR); CDC-GHSA

Rationale

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.

Background

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 proposed to conduct an operational research with the objectives to establish and 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.

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

Methods:

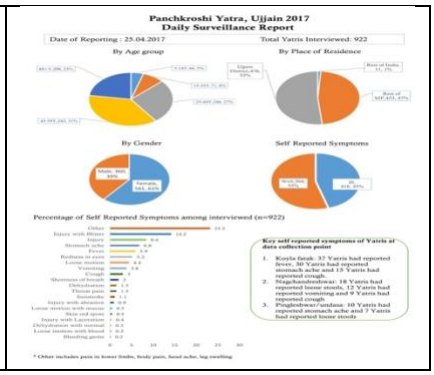
Specific tasks	Methods
Description of public health preparedness plan	• Reviewed records, reports, documents • Participated in review /orientation meetings • Inspected mass gathering (fairs and festivals) site • Discussed with stakeholders • Developed plans in collaboration with administrators and health team (Inter-department co-ordination)

<table>
<tr><td>Monitoring of implmentation of public health preparedness plan</td><td>• Reviewed records
• Abstracted data
• Surveyed pilgrims using semi-structured questionnaire
• Monitored public health measures (WASH, solid waste management, vector control, fire safety, crowd control, IEC and supervision of food and sanitation)
• Evaluated processes using a checklist</td></tr>
<tr><td>Establishing real-time surveillance for limited number of syndromes and/or disease conditions</td><td>• For syndromic conditions/self-reported symptoms
• Developed nominal register/reporting forms
• Used mobile/tablet based data collection
• Trained health staff/ volunteers on case definitions, online reporting</td></tr>
<tr><td>Documentation of effectiveness of surveillance system</td><td><table><tr><th>Attributes</th><th>Data collection method</th></tr><tr><td>Simplicity</td><td>Survey of health staff</td></tr><tr><td>Acceptability</td><td>Review of records and data abstraction (Onsite medical camp reports; IDSP Form P /L;
Survey of health staff)</td></tr><tr><td>Flexibility</td><td>Survey of health staff
Discussion with stakeholders</td></tr><tr><td>Usefulness</td><td>Survey of health staff</td></tr><tr><td>Timeliness</td><td>Review of records and data abstraction</td></tr></table></td></tr>
</table>

Results

We participated in fairs and festivals in Tamil Nadu and elsewhere to strengthen public health preparedness, surveillance and response during such mass gatherings

Event	Place	Tools used
Karthigai Maha deepam (2017)	Tiruvannamalai, Tamil Nadu	Real-time synchronization of surveillance and response data (median time 2 sec)
Panguni Uthiram festival (2017)	Palani, Tamil Nadu	Inter-department co-ordination plan (Temple authorities, District administration and Health Dept.)
Panchkroshi Yatra (2017)	Ujjain, Madhya Pradesh	Web-based interactive dashboard for reporting and data exploration
Periyapalayam Festival (2017, 2018)	Tiruvallur, Tamil Nadu	



Key findings from these activities:

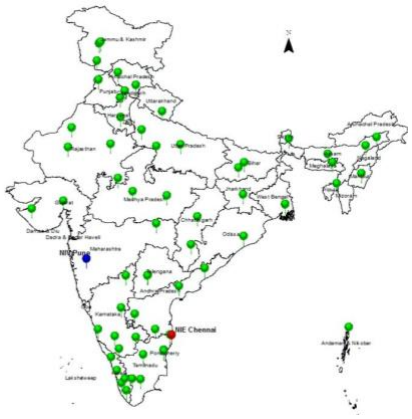
- Implementing and monitoring of public health measures facilitated by
  - Preparation of action plan involving stakeholders
  - Coordination and involvement of stakeholders during implementation
- Surveillance at medical camp helped in detecting outbreak potential syndromes
- Satisfactory survey results helped to assess the pilgrims satisfaction level on public health preparedness activities level

Based on the experience from operational research conducted in Tamil Nadu and at the national level and in collaboration with Tamil Nadu Directorate of Public Health and Preventive Medicine, we will update the Act/Guidelines specific to Tamil Nadu's notified fairs and festivals and subsequently develop guidelines/SOPs/digital tools for public health preparedness, surveillance and response during mass gatherings in the Indian context.

12. VIRUS RESEARCH & DIAGNOSTIC LABORATORIES NETWORK (VRDLN)

Principal Investigator: Manoj Murhekar
Co-Investigators (NIE): Vasna Joshua, K Kanagasabai, B K Kirubakaran, M Ravi, V Ramchandran, Vishal Shete, R. Sabarinathan
Funding agency: Indian Council of Medical Research (ICMR)

Background: The Dept of Health Research has been establishing a network of virology laboratories to strengthen the laboratory capacity in the country for timely identification of viruses and other agents causing morbidity significant at public health level and specifically agents causing epidemics and/or potential agents for bioterrorism. The number of laboratories in the network has increased from 20 in 2014, 34 in 2015, 37 in 2016, and 61 by Nov 2018 covering 27 Indian states/Union territories (Fig. 1). Demographic, clinical, and laboratory details from the patients enrolled in the surveillance is collected using a case report form and are entered in a web-based data entry system. NIV Pune is nodal agency f procedures while NIE Chennai is data mining center for VRDLs.



VRDL Network

Disease clusters diagnosed: During Dec 2017- Oct 2018, VRDLs provided diagnosis to 138 disease clusters. These included measles (n=55), Varicella Zoster Virus (n=22), dengue (n=17), Chikungunya (n=17), HAV (n=09), Influenza (n=02). Information about the outbreaks diagnosed by VRDLs was communicated to the state IDSP and NVBDCP within 24 hrs of reporting.

Diagnosis provided to patients attending medical colleges:
Besides providing the diagnosis to 138 outbreaks, VRDLs investigated patients attending the medical colleges that housed VRDLs. Out of 1,19,298 patients tested 25,327(21.2%) were positive for viral disease . The commonly tested virus included Dengue, Chikungunya, Influenza A H1N1, HAV, HEV, HSV, JE.

Conclusions: VRDLs are providing timely diagnosis to diseases clusters as well as generating case based data about emerging and re-emerging viral infections
in the country.

RESPONSE TO PUBLIC HEALTH EMERGENCIES

13. NIPAH OUTBREAK INVESTIGATION, KERALA, 2018

Principal Investigator: ICMR-NIE team
Collaborating Institute(s): Kerala Health Services, Govt. Medical College-Kozhikode, ICMR-National Institute of Virology, ICMR-RMRC-Port Blair
Funding agency: Indian Council of Medical Research (ICMR)

Rationale
During May 2018, Nipah virus (NiV) outbreak occurred in Kozhikode and Malappuram districts of Kerala. This is the first time that NiV is reported in this part of the Country. Hence, necessitated in-depth epidemiological investigations.

Background
On 2 Jun 2018, ICMR-NIE team joined response team at the request of Kerala State to conduct epidemiological investigations and support for data analysis and management.

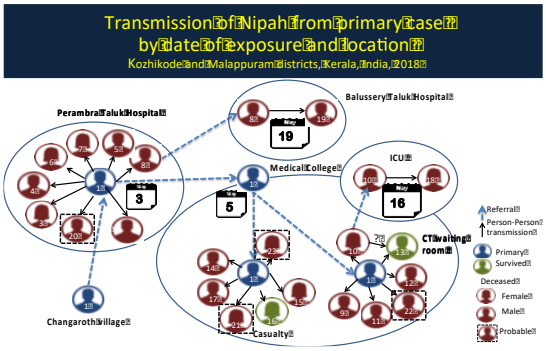
Objectives
(1) Describe epidemiology of NiV
(2) Explore possible source/s of infection of primary case through anthropological investigations
(3) Determine factors responsible for person-to-person transmission of Nipah through case-control study
(4) Estimate sero-prevalence of Nipah among close contacts of lab confirmed cases

Methods
We described epidemiology of the outbreak by using data available from District Nipah control centre, Kozhikode by time, place and person. An anthropologist explored possible source/s of infection of primary case through interview of contacts, family members and key

informants. We conducted a case-control study to identify risk factors for person-to-person transmission of NiV. We did a sero-survey of close contacts of NiV cases for IgM and IgG antibodies against NiV.

Results

1) **Descriptive epidemiology:** Total of 23 NiV cases reported. Of them, five were probable and 18 were laboratory-confirmed cases. All the confirmed cases except one (who had mild, uncomplicated fever) presented with acute neurological and/or respiratory symptoms and 16 of them died (case fatality ratio: 89%). The source of infection of the primary case was unknown and 21 cases had history of close contact with NiV patients



2) **Anthropological study of primary case**: Identified several potential sources/circumstances of transmission

3) **Case-control study of risk factors:** Interviewed 18 cases and 72 controls and identified contact with body fluids of NiV case-patients as a key risk factor

4) **Sero-survey of close contacts:** Three of 279 surveyed were sero-positive

14. PROVISION OF CONTINUUM OF CARE TO NON-COMMUNICABLE DISEASES POST FLOODS IN KERALA, INDIA 2018.

Principal Investigator: P. Ganeshkumar
Co-investigators: Prabhdeep Kaur
Collaborating Institute(s): Kerala Health Services, ICMR-RMRC-Port Blair

Background and Rationale

Kerala, the southernmost state in India, faced flood disaster due to unprecedented proportions of rain during August 2018. Floods damaged 344,047 homes and nearly displaced one million people. Floods affected 10 administrative districts in the state, claiming more than 480 lives. Health emergency response has largely been seen within the prism of prevention of communicable diseases.

Recent survey in Kerala state to generate state level estimates on non-communicable disease indicated that prevalence of uncontrolled hypertension and Diabetes was more than 80%. Also, non-communicable diseases such as Diabetes, Hypertension, Coronary artery diseases are on the rise in Kerala in the recent decade. In the light of high and ever-increasing burden of NCDs in the state, there was an increasing realization on continuum of care of NCDs during emergencies. During floods, there was difficulty of access to existing medication, loss of prescription, non-accessibility to routine health care services lead to prolongation of disruption of treatment. ICMR - National Institute

of Epidemiology along with Kerala State NCD cell setup a plan for emergency response to address non-communicable disease post floods.

Methods

World Health Organization South-East Asia (WHO- SEARO) technical guidance document on Integration of NCD care in emergency response and preparedness was adopted. A core team was formed under the State NCD cell post floods, under which major non-communicable diseases were prioritized. One-page Standard treatment and referral protocol was framed on these diseases. Teams were deployed to the high priority flood affected districts to sensitize the care providers on protocol and as well reporting of NCD consultation post floods.

Response output and lessons learnt

As a result of these initiatives, by end of September 2018, more than 1 lakh NCD consultations were done at public health facilities predominantly by primary care and nearly 1800 referrals were made. Hypertension and diabetes were the major illnesses handled in these consultations. The state had learnt many lessons during this period related to NCD consultations. Prioritizing the continuum of care of non-communicable disease during disasters among the program managers and care providers were crucial. Information Education and Communication to sensitize the known NCD patients to seek care in camps or health facilities should be uniformly executed in all districts. Periodic reporting of NCD consultations from each camp and health facilities through an established daily reporting system using available communication methods would monitor the implementation of continuum of care NCD post floods.

15. EFFECTIVENESS OF DOXYCYCLINE PROPHYLAXIS FOR PREVENTION OF LEPTOSPIROSIS, KERALA

Principal Investigator: AP Sugunan (RMRC, Port Blair)
Co-investigators: C. Girishkumar, P. Ganeshkumar, P Vljayachari, MV Murhekar
Collaborating Institute(s): Directorate of Health Services, Govt of Kerala, ICMR-RMRC-Port Blair

Background and Rationale

During the floods in Kerala during August 2018, a large number of people living in 12 out of the 14 districts of the State were exposed to flood waters and in many cases for prolonged period of time. Since the flood waters are likely to be contaminated with the urine of animals including rodents, people exposed to flood waters were at risk of infection by Leptospira. Kerala Health Services undertook a massive doxycycline prophylaxis programme with the goal of mitigating the risk of leptospirosis during the post-flood period. In spite of this, more than 800 confirmed cases and several dozen deaths due to leptospirosis were reported by the Integrated Disease Surveillance Programme in the State during the post-flood period. We conducted a study to estimate the effectiveness of doxycycline prophylaxis in preventing leptospiral infection, disease and death among people exposed to flood waters during the flood of Kerala in August 2018.

Objectives

1. To estimate the effectiveness of doxycycline prophylaxis in preventing leptospiral infection, disease and death in people exposed to flood waters
2. To identify the associated risk factors for development of leptospirosis infection and disease

Methods

Study design and definition of case and control: We conducted a case-control design. Persons who were exposed to flood waters in Kozhikode district but did not suffer any febrile illness during the post-flood period were eligible persons for recruitment. Those eligible persons whose blood samples gave a titre of 1 in 200 or more in microscopic agglutination test (MAT) and a positive IgM ELISA were considered as cases of asymptomatic leptospiral infection. Patients admitted to health facilities in Kozhikode with febrile illness positive for anti-Leptospiral IgM and with a MAT titre of 1 in 200 are considered as cases of symptomatic leptospiral infection. Eligible persons who are negative in MAT and IgM ELISA will constitute the controls for effectiveness estimations.

Data on exposures and confounding variables: Information on doxycycline intake and exposure to flood water were collected from both cases and controls. Details of exposure such as number of doses/ weeks of intake of doxycycline as well as period of exposure to flood water were collected using a structured questionnaire during the interview.

Lab investigations: Five ml of venous blood was drawn from all respondents. IgM ELISA was done to detect anti-leptospiral IgM antibodies. MAT using a panel of live Leptospira reference strains representing the circulating serogroups in India is currently being performed on these samples.

Data analysis: Causal relationships between exposures, potential confounding variables and leptospirosis were explored. ORs and 95% CIs, unadjusted and adjusted for confounding variables are being estimated by bivariate analysis. Effectiveness of doxycycline prophylaxis in preventing leptospirosis is calculated as 1-OR.

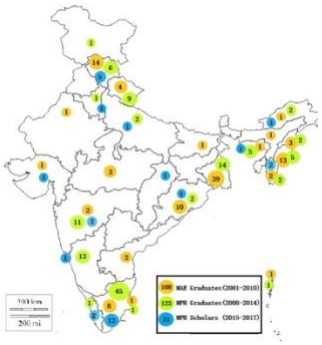
Preliminary findings

A total of 1,085 persons exposed to flood waters in Kozhikode district were enrolled into the study. In addition, 60 cases of leptospirosis detected at various health facilities were also included in the study. Cases and healthy individuals enrolled in the study were interviewed and their blood samples were obtained. IgM ELISA and MAT testing is ongoing.

PUBLIC HEALTH TRAINING PROGRAMS

16. MASTER OF PUBLIC HEALTH (EPIDEMIOLOGY AND HEALTH SYSTEMS)

- MPH (EHS) is in its tenth year.
- 15/17 scholars of 8th (2015) cohort and one scholar of 7th (2014) cohort graduated in June 2017.
- 14 scholars were admitted to the 10th cohort in July 2017 – ICMR-National Institute for Research in Tuberculosis 1, Arunachal Pradesh 1, Uttar Pradesh 1, Kerala 1, Chhattisgarh 1, Himachal Pradesh 3, Tamil Nadu 5
- 17 scholars of 9th cohort were in the process of data collection for their dissertation until March 2018.
- 2 abstracts presented at the 9th TEPHINET Global Scientific Conference, Thailand, August 2017.
- 9 publications during 2017-18.



Distribution of MAE and MPH graduates (n=250)

17. MSC. BIOSTATISTICS

NIE has been conducting MSc Biostatics course since 2016. The course is affiliated with the Periyar University. The first batch of MSc Biostatistics has successfully completed the course and they have been placed in IT industry. Nine students were admitted in the third batch and the course commenced on 3 July 2018. The Second year students have done two field projects in Ayapakkam cohort.

18. NONCOMMUNICABLE DISEASE EPIDEMIOLOGY FELLOWSHIP

Principal Investigator: Prabhdeep Kaur
Co-Investigator(s): P. Ganeshkumar
Collaborating Institute(s): CDC- India
Funding Agency: CDC, Atlanta

Background

ICMR - NIE in collaboration with United States Centers for Disease Control and Prevention (CDC) initiated a “Fellowship in Noncommunicable Disease Epidemiology” to enhance the epidemiology capacity of health professionals working in the NCD programs. The program is a two-year training program in applied epidemiology, with an emphasis on providing practical, analytical, epidemiological skills through hands-on activities such as surveillance evaluations, coverage surveys, field investigations, and applied public health research focused on CVD. This training model is based on the India Epidemic Intelligence Service (EIS) South program at NIE where trainees learn mostly through on-the-job field projects with close mentorship and minimal classroom training. This fellowship will help transform NCD program officers at the state level into trained field epidemiologists capable of addressing the public health challenges facing India due to CVD and other NCDs.

Objectives

- Create highly competent NCD field epidemiologists within the public health sector to meet national need for public health leaders
- Strengthen the public health system through data analysis of programmatic and surveillance data, evaluation of NCD initiatives and implementation research

Core Activities of Learning

Fellows will have the following requirements consistent with the EIS South in the form of Core Activities of Learning (CALS). These activities will revolve around the job placement sites (most likely CVD).

- Analysis of programmatic/surveillance data (1)
- Field investigations/ Outbreak investigation (3)
- Analytical epidemiological study (planned with a protocol) (1)
- Surveillance system or program evaluation (1)
- Abstract submission (1)
- Short oral presentation (5-15 minutes) at scientific conference
- Long oral presentation (20-30 minutes) for technical audience (e.g. weekly seminar)
- Scientific manuscript cleared for submission

Progress

First cohort was initiated on 6th August, 2018 with 5 fellows from Punjab (1), Telangana (1), Kerala (1), Madhya Pradesh (1) and WHO Country Office, India (1). Two contact sessions were held since the initiation of the program. NCD fellows completed secondary data analysis of the NCD program data and Kerala NCD Fellow participated in the NCD surveillance post Kerala floods.

19. INDIA EPIDEMIC INTELLIGENCE SERVICE PROGRAMME (EIS)

Name of the Principal Investigator: Manoj V Murhekar
Name(s) of Co-Investigator(s): Prabhdeep Kaur, Ganesh Kumar
Collaborating Institute(s): CDC- India
Funding Agency: CDC, Atlanta

Background

The India Epidemic Intelligence Service Programme (EIS), a Government of India initiative, is modeled on the US Centers for Disease Control and Prevention (CDC). India EIS Programme is a joint venture between India and USA, is aimed at preparing public health professionals in India for leadership positions at district, State and national levels. The Ministry of Health and Family Welfare, International Health Division, Government of India, vide OM No.GHSA/WFD/1/2016-GHSA Project Cell/IH dated 26 December 2016 decided to create the South hub of India EIS at ICMR-National Institute of Epidemiology in collaboration with CDC. The South hub covers Union Territories of Andaman & Nicobar Islands and Puducherry and the States of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana.

Objectives

- Create highly competent field epidemiologists within the public health sector to meet national need for public health leaders
- Strengthen the public health system through rapid outbreak response throughout the country
- Facilitate a more integrated approach to public health practice through integration of field and laboratory components
- During the two years, officers conduct the following activities and become proficient at
    - Conducting outbreak investigations
    - Analyzing surveillance data and evaluating surveillance systems
    - Conducting planned epidemiologic studies
    - Writing scientific reports for peer reviewed journals and public health bulletins
    - Preparing and delivering oral and poster presentations at national and international meetings

Progress

First cohort was initiated on 6th August, 2018 with 5 EIS Officers from Telangana (2), Kerala (1) and Tamilnadu (2). Two contact sessions were held since the initiation of the program. EIS fellows completed secondary data analysis of the surveillance data and Kerala EIS officers participated in the Leptospirosis outbreak and other post flood surveillance activities.

20. NIE-ICMR E-CERTIFICATE (NIECER) COURSES

Principal Investigator: P. Manickam
Co-Investigator(s): ICMR-NIE faculty members and collaborating institutions
Collaborating Institute(s): NPTEL at IIT-M
Funding agency: Indian Council of Medical Research (ICMR)

Rationale

ICMR-NIE announced the launch of Massive Open Online Course (MOOC) 'NIE-ICMR e-Certificate' courses– called as NIeCer course collaboration with NPTEL hub at IIT-Madras, Chennai.

Background

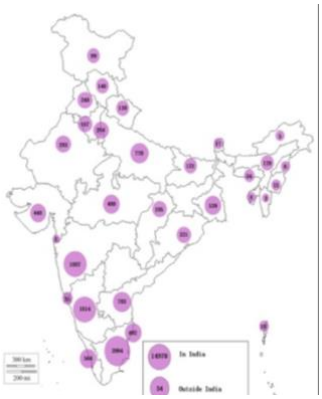
ICMR-NIE established partnership with NPTEL's (National Programme on Technology Enhanced Learning) national hub hosted @ IIT-Madras (IITM), Chennai. NPTEL provides world's largest free MOOCs in engineering, science and humanities streams. [NPTEL is a joint initiative of Indian Institutes of Technology (IITs) and Indian Institute of Science (IISc). It is currently funded by SWAYAM initiative of Ministry of Human Resource Development, India. NPTEL is one of the National Co-ordinators for SWAYAM]. NPTEL offers full MOOCs support for production and an online portal for running. The first in the NIeCer series, Health Research Fundamentals (NIeCer 101) was launched in 2016.

Objectives

- Develop, run and facilitate Massive Open Online Courses (MOOCs) through ICMR-NIE's NIE-ICMR e-Certificate (NIeCer) courses
- Collaborate with various partners for offering MOOCs

NIeCer 101: Online course on Health Research Fundamentals

- The course is open to undergraduate students in Medical/Dental/AYUSH disciplines or graduates in any other discipline as well. The course explains the fundamental concepts in epidemiology and bio-statistics related to research methods. It will also provide an overview of steps and principles for designing bio-medical and health research studies among human participants. The total duration of the course is 20 hours to be completed in 8 weeks. The participants will learn through video lectures, presentation slides, quizzes and readings. The course is offered free of cost. However, the participants desirous of obtaining certificate have to appear for final certification exam at the end of the course for which Rs. 1100/- is to be paid as examination fee. The certification exam will be conducted at the end of the course at designated centres in selected cities of India. Approximately 18000 candidates from across the Country participated in the course during 2016-18. The next session of the course is scheduled during January 2019.



Participants of the NIeCer101: Health Research Fundamentals

NIeCer 102: Online Course for Ethics Committees

- ICMR-NIE is also currently producing a course: NIeCer 102: Online Course for Ethics Committees. This multi-faceted, comprehensive and up-to-date training programme will be tailor made to build the capacity of the current and potential ethics committee members. This is technically supported by WHO. The course development is guided by an advisory group with members from leading Indian government bodies like ICMR, The Central Drugs Standard Control Organization and Translational Health Science and Technology Institute and that of WHO-India and health research professionals from reputed institutions across the country. The faculty members of this course are expertise of eminent officials in the field of Ethics. This course is built on important aspects of national & international guidelines, establishment & Administration of Ethics Committee. Online Course for Ethics Committees course will be launched shortly.

21. PUBLICATIONS (JAN-DEC 2018)

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