Report of the National Workshop on Reprioritization of Diseases

Integrated Disease Surveillance Programme

December 2016
Report of the National Workshop on Reprioritization of Diseases

Integrated Disease Surveillance Programme

December 2016
Acknowledgements

The report was drafted by Dr Pavana Murthy, Dr Giridhara Babu, Mr Himanshu Sekhar Pradhan, Dr Ramesh Krishnamurthy and further peer reviewed by the experts who participated in the workshop.
Contents

Abbreviations i

Executive summary 1

Key recommendations 2

1 Background 3
   1.1 Prioritization process 4
   1.2 Formation of the working group 4

2 Proceedings of the workshop – Day 1 5
   2.1 Inauguration 5
   2.2 Session 1: Trends in surveillance systems and current status of IDSP 6
   2.3 Sessions 2 & 3: Disease prioritization 7

3 Proceedings of the workshop – Day 2 9
   3.1 Session 4: Findings of group work and panel reflections 9
   3.2 Session 5: Data collection tools for IDSP 14
   3.3 Session 6: Information and communication technology for IDSP 15
   3.4 Session 7: Recommendations and conclusions 17

Annexures 19

Annexure 1: Agenda 19

Annexure 2: List of participants 22
# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES</td>
<td>acute encephalitis syndrome</td>
</tr>
<tr>
<td>AFI</td>
<td>acute febrile illness</td>
</tr>
<tr>
<td>ANM</td>
<td>auxillary nurse midwife</td>
</tr>
<tr>
<td>ARI</td>
<td>acute respiratory infection</td>
</tr>
<tr>
<td>CCHF</td>
<td>Crimean-Congo haemorrhagic fever</td>
</tr>
<tr>
<td>CDC India</td>
<td>US Centers for Disease Control and Prevention – India Country Office</td>
</tr>
<tr>
<td>CHC</td>
<td>community health centre</td>
</tr>
<tr>
<td>CSU</td>
<td>central surveillance unit</td>
</tr>
<tr>
<td>DDG</td>
<td>Deputy Director General</td>
</tr>
<tr>
<td>DGHS</td>
<td>Director General of Health Services</td>
</tr>
<tr>
<td>DHS</td>
<td>Director Health Services</td>
</tr>
<tr>
<td>DSU</td>
<td>district surveillance unit</td>
</tr>
<tr>
<td>FA</td>
<td>factor analysis</td>
</tr>
<tr>
<td>GHSA</td>
<td>Global Health Security Agenda</td>
</tr>
<tr>
<td>HIS</td>
<td>Health Information System</td>
</tr>
<tr>
<td>HO</td>
<td>Health Officer</td>
</tr>
<tr>
<td>ICMR</td>
<td>Indian Council of Medical Research</td>
</tr>
<tr>
<td>ICT</td>
<td>information and communication technology</td>
</tr>
<tr>
<td>IDSP</td>
<td>Integrated Disease Surveillance Project</td>
</tr>
<tr>
<td>IHR</td>
<td>International Health Regulations</td>
</tr>
<tr>
<td>ILI</td>
<td>influenza-like illness</td>
</tr>
<tr>
<td>IT</td>
<td>information technology</td>
</tr>
<tr>
<td>JE</td>
<td>Japanese encephalitis</td>
</tr>
<tr>
<td>JMM</td>
<td>Joint Monitoring Mission</td>
</tr>
<tr>
<td>JS</td>
<td>Joint Secretary</td>
</tr>
<tr>
<td>KFD</td>
<td>Kyasanur Forest Disease</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>L Form</td>
<td>Laboratory Surveillance Form</td>
</tr>
<tr>
<td>MCI</td>
<td>Medical Council of India</td>
</tr>
<tr>
<td>MoHFW</td>
<td>Ministry of Health &amp; Family Welfare</td>
</tr>
<tr>
<td>NCD</td>
<td>noncommunicable disease</td>
</tr>
<tr>
<td>NCDC</td>
<td>National Centre for Disease Control</td>
</tr>
<tr>
<td>NHM</td>
<td>National Health Mission</td>
</tr>
<tr>
<td>NPCDCS</td>
<td>National Programme for Prevention and Control of Cancers, Diabetes, Cardiovascular Disease and Stroke</td>
</tr>
<tr>
<td>NPO</td>
<td>National Programme Officer</td>
</tr>
<tr>
<td>NVBDCP</td>
<td>National Vector Borne Disease Control Programme</td>
</tr>
<tr>
<td>P Form</td>
<td>Presumptive Surveillance Form</td>
</tr>
<tr>
<td>PHFI</td>
<td>Public Health Foundation of India</td>
</tr>
<tr>
<td>RNTCP</td>
<td>Revised National Tuberculosis Control Programme</td>
</tr>
<tr>
<td>S Form</td>
<td>Syndromic Surveillance Form</td>
</tr>
<tr>
<td>SARS</td>
<td>severe acute respiratory syndrome</td>
</tr>
<tr>
<td>SHOC</td>
<td>Strategic Health Operations Centre</td>
</tr>
<tr>
<td>SSU</td>
<td>state surveillance unit</td>
</tr>
<tr>
<td>WCO India</td>
<td>WHO Country Office for India</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WR</td>
<td>WHO Representative</td>
</tr>
</tbody>
</table>
Executive summary

In keeping with one of the key recommendations of the Joint Monitoring Mission (JMM) of 2015, the Integrated Disease Surveillance Project (IDSP) administered a reprioritization exercise to review the relevance and importance of all diseases and conditions under IDSP. JMM strongly recommended the redesign of the IDSP surveillance system with reprioritization of the diseases/disease groups. This had to be guided by assessing the need for collecting more epidemiological data for action, especially for the priority diseases, and redefining the required surveillance deliverables.

The purpose of the reprioritization exercise was to ensure the best use of limited human and financial resources for disease surveillance, taking into account changing demographic and epidemiological conditions. The exercise was essential to ensure that both planning and resource allocation were rational, explicit and transparent.

The objectives of the exercise were to:

- Review the relevance of the list of priority diseases for surveillance under IDSP;
- Strengthen IDSP in its resource allocation for disease surveillance and response; and
- Focus on the diseases that affect the majority of the population and have more severity and adverse sequels.

The reprioritization exercise was organized in a systematic manner. Firstly, an initial list of 46 diseases that included zoonotic, food borne, water borne, vector borne and vaccine preventable diseases were considered based on key parameters such as disease burden, severity, epidemic potential, health gain, socioeconomic impact and international regulations. Subsequently, a suggestive list of 32 diseases was considered in consultation with the National Centre for Disease Control (NCDC).

The next step was to assemble an expert group consisting of disease-specific specialists, statisticians, laboratory specialists and public health professionals at all levels and from different surveillance and control programmes to include representation from the Centre, states, academia, World Health Organization (WHO), US Centers for Disease Control and Prevention (CDC) and other health and development partners through a workshop. This workshop was organized by WHO in collaboration with NCDC, Ministry of Health & Family Welfare (MoHFW), Government of India (GoI) and CDC on 6–7 December 2016 in New Delhi.

During the workshop, the experts were divided into eight groups and were provided with a disease-scoring sheet. Each group was provided with a list of 32 diseases and basic disease profile for each disease. A group chair and rapporteur were identified for each group and they facilitated scoring of all the 32 diseases. The scoring for each disease was marked on the scoring sheet through a consensus process within each group. The scoring sheet contained 11 scoring dimensions to prioritize each disease. The scoring dimensions included present burden of diseases, severity, mortality, epidemic potential, socioeconomic impact, preventability, treatability, relevance to IHR, international resolutions, relevance to regional control and relevance to control within the state.

At the end of the reprioritization exercise, the scores from all groups for all diseases were weighed and averaged to create a prioritized diseases list. The prioritized diseases list was
further validated by statistical experts and scores were further analysed using factor analysis, which resulted in identification of 32 diseases/conditions reprioritized in a rank order of importance (disease list is reflected in the report). Apart from the 32 diseases, there was consensus among groups to also include human rabies into the list.

Updating IDSP’s Integrated Disease Surveillance, and best practices from the Bruhat Bengaluru Mahanagara Palika (BBMP) experiences in software for IDSP were discussed during the meeting.

**Key recommendations**

Following are the key recommendations of the workshop:

- As a first step, following this prioritization exercise, IDSP needs to update the following components for all 32 prioritized diseases: (i) case definitions; (ii) type of surveillance to be implemented for each of the prioritized diseases; (iii) minimum data sets and data collection standards for each prioritized disease. It also needs to make all relevant changes to the reporting forms to reflect the amendments.
- An expert consultation needs to be organized for updating data capturing tools (S, P and L Forms) and minimum data sets for the diseases including finalization of the formats for surveillance.
- IDSP to advise all state surveillance units (SSUs) to conduct similar reprioritization exercises to include diseases of importance at the state level.
- IDSP’s information and communication technology (ICT) platform and information management needs to be upgraded to conform to the current standards. A comprehensive ICT and Information Management Master Plan Document needs to be developed and maintained.
- A comprehensive Operational Document must be developed to implement the aforementioned Master Plan with clearly articulated timelines, roles and responsibilities.
- Updated Data-sharing agreements need to be put in place between various parties, including states, local governments and the private sector.
- As part of a national integrated disease surveillance effort, IDSP needs to identify all relevant disease surveillance aggregate data from specialized disease surveillance programmes for potential inclusion under a common integrated disease surveillance “dash board” that will be administered by IDSP.
1 Background

Disease surveillance is a critical component of the health system. A functional surveillance system not only provides the information for action on priority communicable diseases, but also plays a crucial role in public health decision-making. Surveillance systems are usually developed over time, with new diseases being added and a few being removed. A national surveillance system should cover the diseases of public health importance that affect the majority of the population with severe and adverse consequences.

Prioritization of diseases is an integral, periodic process to strengthen a national surveillance system for communicable diseases and can be used as an aid in making decisions about resource allocation. In many surveillance systems, data are collected which never result in public health action, and new threats are considered insufficiently or not at all. As public health risks change over time, prioritization of diseases for surveillance should be reviewed periodically.

The Integrated Disease Surveillance Programme (IDSP) in India was launched in 2004 to detect and respond to disease outbreaks. It became a National Programme during the Twelfth Five-Year Plan and functions under the umbrella of the National Health Mission. The first disease prioritization for IDSP was done in 2004 and subsequently in 2009. Currently, 18 disease conditions are being monitored under IDSP. In 2015, the Joint Monitoring Mission (JMM) for IDSP strongly recommended redesign of the IDSP surveillance system with reprioritization of the diseases/disease groups. In the recent past, India has recognized the geographic expansion of diseases such as scrub typhus, Crimean-Congo haemorrhagic fever (CCHF) and Japanese encephalitis (JE). Hence, there is a need to relook at disease prioritization and investments for enhancing the surveillance mechanisms.

Considering all these aspects for strengthening the IDSP, World Health Organization Country Office for India (WCO India) jointly with National Centre for Disease Control (NCDC) of the Ministry of Health and Family Welfare (MoHFW), US Centers for Disease Control and Prevention India Country Office (CDC India) initiated the process for reprioritization of diseases under IDSP. As a preparatory process for the disease reprioritization exercise, a series of activities as detailed below were undertaken ahead of this exercise. The prioritizing of diseases for surveillance involved complex value judgments, such as the relative importance of early detection of a highly infectious disease compared with monitoring endemic, common, but less severe diseases. Hence, the methodology was aimed at a process that would be transparent and acceptable to most stakeholders and implementers of the surveillance system. It attempted to combine quantifiable epidemiological, clinical and financial data with interpretive assessments based on consensus views of informed participants.

Ideally, prioritization should be based on scientific evidence. However, such evidence is frequently unavailable and there is a particular deficiency in data on the effectiveness and outcomes of surveillance systems. As the situations involved insufficient, inadequate, contradictory or even non-existent scientific information, consensus methods such as the Delphi method were considered a valid approach, which provided a structure and process to harness the insight of appropriate experts to enable decisions to be made avoiding personal and political influence and allowing individuals to change their opinion in light of the group response.
1.1 Prioritization process

This prioritization process consisted of the following steps:

- Formulation of a list of diseases and criteria to include/exclude diseases for surveillance
- Formulation of a scoring sheet for prioritizing the diseases against the criteria
- Discussion of the proposed criteria and disease list by participants in the prioritization exercise
- Expression of averaged score of the subject matter experts (based on individual opinions of participants) through scoring the diseases against the criteria
- Collation and summary (using statistical parameters) of the scoring, and assessment of agreement
- Feedback of the individual and group rankings to the participants and discussion of the results
- Weighting and revision of the prioritized list of diseases
- Sharing the finalized list of prioritized diseases.

1.2 Formation of the working group

A working group was formed with representation from MoHFW, NCDC, IDSP, Public Health Foundation of India (PHFI) and medical colleges. WHO guided the disease reprioritization process. A consultative process with IDSP ensured finalization of case definition of diseases. There were two technical consultations held for finalization of cases definitions of various diseases (likely to be considered for inclusion under IDSP) including emerging and remerging diseases under various categories such as zoonotic, vaccine preventable, vector borne, food and water borne, as well as diseases covered under International Health Regulation (IHR).

Considering different parameters such as disease burden, epidemic potential, health gain, socioeconomic impact, etc. a list of 46 diseases was prepared. Further, through a consultative process with NCDC, a suggestive list of 32 diseases was generated for consideration under the disease prioritization exercise. However, the experts were provided the flexibility to include or exclude diseases during the disease reprioritization exercise. Disease information sheets were prepared and used during the prioritization exercise to assist the experts.

Formation of experts: Experts from the various fields were assembled consisting of disease specific experts, statisticians, IT, laboratory and public health professionals. Over 80 subject matter experts representing states, the Centre, academia, WHO, CDC and other health and development partners participated in the workshop. The list of participants is at Annex 2.
2 Proceedings of the workshop – Day 1

The two-day National Workshop on Reprioritization of Diseases was held on 6–7 December 2016 to reprioritize the diseases/disease groups under IDSP and standardize case data elements, data collection methods and information technology (IT) tools.

2.1 Inauguration

In his welcome address, Dr S. Venkatesh, Director, NCDC highlighted the achievements and initiatives taken by NCDC and IDSP over the years. He said that the disease reprioritization workshop would help in making decisions for resource allocation under IDSP as well as in effective execution of the programme and standardization of data elements, data collection methods and IT tools.

In his address, Dr A.K. Gadpayle, Additional Director General of Health Services (Addl DGHS), MoHFW emphasized the need for reprioritization of diseases under surveillance in IDSP in view of the recent threats posed due to emerging and re-emerging of diseases.

Speaking on the occasion, Mr Lav Aggarwal, Joint Secretary (JS), MoHFW stressed that IDSP should be the mother of all monitoring mechanisms for various health programmes and that there is a need for renewed focus on IDSP. He stressed that appropriate strategies needed to be developed for capturing disease data from urban areas as well as from the private sector. He emphasized the use of latest IT tools to make meaningful interventions from the surveillance data collected in the field.

Dr Henk Bekedam, WHO Representative (WR) to India emphasized the need to equip India’s surveillance system well in view of emerging threats like severe acute respiratory syndrome (SARS), Ebola, Zika, etc. Further, he emphasized the need for strengthening the laboratory component of IDSP and use of IT for real-time web-based reporting, collaboration of the health department with the agriculture sector for zoonotic diseases and strengthening of public health cadres for enhancing the surveillance system in India.
Dr B.D. Athani, Special DGHS, MoHFW outlined establishing linkages with other communicable disease programmes for accessing the data from them and the need to establish linkages with the private sector for receiving disease related data.

Reflecting MoHFW’s commitment to strengthening the IDSP, Professor (Dr) Jagdish Prasad, DGHS, MoHFW emphasized the need to urgently fill the critical vacant positions of epidemiologists, microbiologists and entomologists under IDSP and train them for strengthening the surveillance programme. He further emphasized on strengthening IDSP laboratories, its infrastructure, surveillance as well as augmenting the implementing of IDSP.

2.2 Session 1: Trends in surveillance systems and current status of IDSP

Session Chair : Dr B.D. Athani, Special DGHS, MoHFW
Co-chairs : Dr Gadpayle, Addl. DGHS, MoHFW
Dr K.K. Aggarwal, President-elect, Indian Medical Association

Four presentations were made in this session.

- Key functions, structure and data management aspects of IDSP were covered by Dr Pradeep Khasnobis, National Programme Officer (NPO), IDSP, NCDC. Achievements as well as constraints of IDSP were highlighted. Areas that need focused interventions were: monitoring of IDSP by State Health Secretary/Mission Director, National Health Mission (NHM)/Director Health Services (DHS); enhancing coordination between DHS and Director Medical Education; recording of diagnosis by doctors in the OPD register in major hospitals; participation of the private sector in data reporting; functioning of identified district public
health laboratories under IDSP; strengthening urban surveillance; sending samples to the laboratory in all outbreaks; and convergence with other national health programmes and ICMR.

- Dr Sameer Sodha, CDC Resident Advisor, Epidemic Intelligence Service Programme, India highlighted two laboratory-based surveillance projects with the Global Health Security Agenda (GHSA) – acute febrile illness (AFI) surveillance led by Manipal Centre for Virus Research and acute encephalitis syndrome (AES) surveillance led by National Institute of Mental Health and Neurosciences. A number of recommendations were made, such as use of laboratory-based surveillance to monitor trends, detect outbreaks and guide laboratory strengthening; evaluate rapid diagnostic tests for leading pathogens for potential sub-district/district level use, unifying data management of surveillance systems for the National Vector Borne Disease Control Programme (NVBDCP), IDSP, and Child Health Division; ensuring same case definitions (e.g. meningitis versus AES) and encouraging increased laboratory testing at district level.

- Dr Vason Pinyowiwat, Technical Officer, WHO Regional Office for South-East Asia highlighted surveillance models of Sri Lanka and Thailand, describing the organization of the surveillance system, disease notification system, data collection and reporting mechanisms of Sri Lanka as well as organization of surveillance system, list of diseases under surveillance and morbidity notification of Thailand.

- Dr Nishant Kumar, Assistant Director, IDSP, NCDC brought out that initially 13 core diseases and conditions were under surveillance in IDSP. The disease list was revised in 2009, giving more focus on outbreak-prone diseases with 18 disease conditions. Evolution of data reporting formats as well as data management aspects of IDSP were highlighted in his presentation. Preparatory activities of prioritization exercises such as two consultations were held for finalization of case definitions of diseases under various categories such as zoonotic, vaccine preventable, vector borne, food and water borne.

- Dr Sanket Vasant Kulkarni, Assistant Director, IDSP, NCDC discussed state specific diseases being reported under IDSP. Additional diseases under consideration for IDSP such as scrub typhus, anthrax, Kyasanur Forest Disease (KFD), CCHF and mumps were discussed.

- Dr K. K. Aggarwal, President-elect, Indian Medical Association, suggested to make use of Medical Council of India’s (MCI) regulations, which mandate reporting of diseases by registered medical practitioners. He stressed that Revised National Tuberculosis Control Programme (RNTCP)’s methods for enhancing reporting from the private sector should be adapted for notification/reporting of other diseases.

### 2.3 Sessions 2 and 3: Disease prioritization

**Session Chair**: Dr S. Venkatesh, Director, NCDC

**Co-chair**: Dr Ramesh Krishnamurthy, Senior Advisor, Department of Information, Evidence and Research, Health Systems and Innovation Cluster, WHO

- Dr Giridhara R. Babu, Additional Professor, Indian Institute of Public Health, Bengaluru described the methodology for scoring the diseases. The scoring sheet contained 11 scoring dimensions to prioritize each disease. These scoring dimensions included the present burden of disease, severity, mortality, epidemic
potential, socioeconomic impact, preventability, treatability, relevance to IHR, international resolutions, relevance to regional control and relevant importance to the state. A total of 32 diseases were considered for scoring.

- During the discussion, Dr Venkatesh stressed that numbers alone could not decide the epidemic potential of the disease and that even a single case of some diseases could equate to an epidemic.

- Discussions were held in eight groups. Disease scoring sheets and disease information sheets were provided to each groups. These groups scored all the 32 diseases through a consensus process within each group. The scores from all groups for all diseases were weighed and averaged, resulting in a prioritized diseases list, which was presented during Day 2 of the workshop.
3 Proceedings of the workshop – Day 2

3.1 Session 4: Findings of group work and panel reflections

Session Chair : Dr P.L. Joshi, ex. Director, NVBDCP

Co-chairs : Dr D.C.S. Reddy, ex-Professor and Head of the Department, Preventive and Social Medicine, Institute of Medical Sciences, Banaras Hindu University

Dr Pavana Murthy, National Professional Officer, Surveillance and Response, WHO Country Office for India

3.1.1 Summary of feedback

Summary of feedback of the group work is as follows:

- There should be a national core list of diseases with state specific amendments
- Acute respiratory infection (ARI) and influenza-like illness (ILI) need to be segregated
- “Fever of unknown origin“ to be replaced with “fever” more than 7 days duration
- Acute diarrhoeal diseases to be written as “excluding cholera”
- Rickettsial disease, acute febrile illness (AFI) filariasis, leishmaniasis, poisoning, burns, road accidents, snake bite, dog bite and West Nile Fever should be included in the IDSP disease list
- Small pox to be removed from the IDSP disease list
- Death can be recorded in Presumptive Surveillance Form (P Form)
- Viral hepatitis B & C maybe included in Laboratory Surveillance Form (L Form)
- Reduce duplication of data collection
- Reduce number of diseases in P Form
- Forms require streamlining
- As disease priority differs from state to state, regional priority should be given importance
- Response components should be integrated with surveillance
- Capacity building is needed on data analysis.

Dr Mohammad Shaukat, Deputy Director General (DDG), Noncommunicable Diseases (NCDs), MoHFW, highlighted the issues for and challenges to NCD surveillance and monitoring. Four common NCDs – cardiovascular diseases, diabetes, cancers and chronic respiratory diseases accounted for about 55% of premature mortality in the age group of 30–69 years. The National Programme for Prevention and Control of Cancers, Diabetes, Cardiovascular Disease and Stroke (NPCDCS) focused on the early screening, diagnosis and treatment by NCD cells through community health centres (CHCs) at the district level. The NPCDCS aimed at the integration of NCD interventions within the NHM framework for optimization of scarce resources, provision of seamless services to patients as also for ensuring long term sustainability of interventions.

The NCD programme has developed a recording and reporting mechanism to monitor the key interventions outlined in strategies of the programme. The information is compiled from NCD clinics located at CHC and district levels. In a limited resource setting, IDSP provides a unique opportunity for surveillance and monitoring of key NCD indicators required to guide
the programme. There is a need to debate upon the inclusion of key indicators in the IDSP dashboard with a decision on the frequency of data collection on such indicators.

Dr Pavana Murthy, National Professional Officer, Surveillance and Response, WHO Country Office for India discussed findings of the group work. He demonstrated the data analysis procedure and sample data analysis sheet. The scores from all groups for all diseases were averaged, which resulted in a preliminary prioritized diseases list of 32 disease conditions in a rank order of importance.

There was further validation by statistical experts using factor analysis (FA), which reduced the voluminous data by shrinking it to a smaller data set that was more manageable and more understandable. Finally, range and rank were calculated for each disease loading by the standard range formula and by using the rank function of excel.

Tables 1 and 2 give the final disease/syndrome lists by ranking.

**Table 1: Final list of disease/syndrome after factor analysis**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Final list of diseases after factor analysis</th>
<th>Syndrome/ disease</th>
<th>Pathogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Influenza-like illness</td>
<td>Syndrome</td>
<td>Influenza A/H1N1 pdm09, influenza A/H3N2, influenza B, respiratory syncytial virus A &amp; B, metapneumovirus, parainfluenzavirus 1–4, rhinovirus, adenovirus</td>
</tr>
<tr>
<td>2</td>
<td>Severe acute respiratory infection</td>
<td>Syndrome</td>
<td>Influenza A/H1N1 pdm09, influenza A/H3N2, Influenza B, respiratory syncytial virus A &amp; B, metapneumovirus, parainfluenzavirus 1-4, rhinovirus, adenovirus, corona virus, bocavirus</td>
</tr>
<tr>
<td>3</td>
<td>Dengue</td>
<td>Disease</td>
<td>Dengue viruses (1,2,3 and 4)</td>
</tr>
<tr>
<td>4</td>
<td>Dysentery</td>
<td>Syndrome</td>
<td>Entamoeba histolytica and shigella (including sub types)</td>
</tr>
<tr>
<td>5</td>
<td>Zika virus disease</td>
<td>Disease</td>
<td>Zika virus</td>
</tr>
<tr>
<td>6</td>
<td>Acute hemorrhagic fever</td>
<td>Syndrome</td>
<td>Dengue viruses, nairovirus (CCHF virus), Ebola virus, West Nile virus, arbovirus (yellow fever virus)</td>
</tr>
<tr>
<td>7</td>
<td>Acute viral hepatitis</td>
<td>Syndrome</td>
<td>Hepatitis virus A, B, C, D and E Yellow fever virus</td>
</tr>
</tbody>
</table>
| 8 | Acute diarrhoeal disease (except cholera) | Syndrome | Viruses: Rotavirus, adenoviruses, coronaviruses, enteroviruses  
Bacteria: Enterotoxigenic E. coli, shigella, Campylobacter Jejuni, Salmonella  
Others: *Entamoeba histolytica*, giardiasis, trichuriasis, cryptosporidium |
| 9 | Chikungunya | Disease | Chikungunya virus |
| 10 | Chicken Pox (Varicella Zoster) | Disease | Varicella zoster |
| 11 | Fever more than 7 days duration | Syndrome | Dengue, Chikungunya, Malaria, Leptospirosis, Scrub typhus, Zika and others |
| 12 | Malaria | Disease | *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale* and *Plasmodium malariae* |
| 13 | Scrub typhus | Disease | *Orientia tsutsugamushi* |
| 14 | Cholera | Disease | *Vibrio cholerae O1* |
| 15 | Smallpox | Disease | Variola virus |
| 16 | Enteric fever | Disease | *Salmonella typhi*, *Salmonella paratyphi A*, *Salmonella paratyphi B*, *Salmonella paratyphi C* |
| 17 | Acute flaccid paralysis | Syndrome: DD; Poliomyelitis, Gullian Barre Syndrome, Transverse myelitis | Poliovirus (type 1, type 2 and type 3) Enterovirus, Coxsackie virus and echovirus serotypes  
Herpesviridae; Japanese encephalitis virus |
| 18 | Measles | Disease | Rubeola virus |
| 19 | Acute encephalitis syndrome | Syndrome | Serum: JE, Scrub typhus, West Nile Fever,  
Cerebrospinal Fluid: Enteroviruses, herpes, tuberculosis, *Staphylococcus pneumoniae*, *H influenza* and Nisseria |
<table>
<thead>
<tr>
<th></th>
<th>Disease</th>
<th>Syndrome</th>
<th>Pathogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Meningitis</td>
<td>Syndrome</td>
<td><em>Neisseria meningitidis</em></td>
</tr>
<tr>
<td>21</td>
<td>Yellow fever</td>
<td>Disease</td>
<td>Arbovirus</td>
</tr>
<tr>
<td>22</td>
<td>Rubella</td>
<td>Disease</td>
<td>Rubella virus</td>
</tr>
<tr>
<td>23</td>
<td>Kyasanur Forest Disease (KFD)</td>
<td>Disease</td>
<td>KFD virus</td>
</tr>
<tr>
<td>24</td>
<td>Mumps</td>
<td>Disease</td>
<td><em>Myxovirus parotiditis</em></td>
</tr>
<tr>
<td>25</td>
<td>Anthrax</td>
<td>Disease</td>
<td><em>Bacillus anthracis</em></td>
</tr>
<tr>
<td>26</td>
<td>Crimean-Congo hemorrhagic fever (CCHF)</td>
<td>Disease</td>
<td>Nairovirus</td>
</tr>
<tr>
<td>27</td>
<td>Leptospirosis</td>
<td>Disease</td>
<td>Spirochetes of the genus Leptospira</td>
</tr>
<tr>
<td>28</td>
<td>Plague</td>
<td>Disease</td>
<td><em>Yersinia pestis</em></td>
</tr>
<tr>
<td>29</td>
<td>Brucellosis</td>
<td>Disease</td>
<td><em>Brucella abortus, Brucella melitensis</em> and <em>Brucella suis</em></td>
</tr>
<tr>
<td>30</td>
<td>Pertussis</td>
<td>Disease</td>
<td><em>Bordetella pertussis</em> and <em>Bordetella parapertussis</em></td>
</tr>
<tr>
<td>31</td>
<td>Diphtheria</td>
<td>Disease</td>
<td><em>Corynebacterium diphtheriae</em></td>
</tr>
<tr>
<td>32</td>
<td>Tetanus</td>
<td>Disease</td>
<td><em>Clostridium tetani</em></td>
</tr>
</tbody>
</table>

*Apart from the 32 diseases, there was consensus among the experts to also include human rabies into the list.*
Table 2: Priority syndromes/diseases for Integrated Disease Surveillance Programme – 2017

<table>
<thead>
<tr>
<th>Epidemic prone syndrome/diseases</th>
<th>Syndrome/diseases targeted for eradication or elimination</th>
<th>Other major syndrome/diseases, events or conditions of public health importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute haemorrhagic fever</td>
<td>Acute flaccid paralysis</td>
<td>Acute viral hepatitis</td>
</tr>
<tr>
<td>Chikungunya</td>
<td></td>
<td>Acute diarrhoeal disease (except cholera)</td>
</tr>
<tr>
<td>Cholera</td>
<td></td>
<td>Fever more than 7 days duration</td>
</tr>
<tr>
<td>Dengue</td>
<td></td>
<td>Malaria</td>
</tr>
<tr>
<td>Dysentery</td>
<td></td>
<td>Scrub typhus</td>
</tr>
<tr>
<td>Measles*</td>
<td></td>
<td>Anthrax</td>
</tr>
<tr>
<td>Meningitis</td>
<td></td>
<td>Kyasanur Forest Disease (KFD)</td>
</tr>
<tr>
<td>Plague</td>
<td></td>
<td>Crimean-Congo hemorrhagic fever (CCHF)</td>
</tr>
<tr>
<td>ILI</td>
<td></td>
<td>Leptospirosis</td>
</tr>
<tr>
<td>SARI</td>
<td></td>
<td>Brucellosis</td>
</tr>
<tr>
<td>Enteric fever</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken pox</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubella</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mumps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pertussis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Targeted for elimination

Diseases or events of international concern

- Yellow fever
- Human influenza due to a new subtype
- SARS, Smallpox
- Poliomyelitis
- Zika virus disease
- Any public health event of international or national concern (infectious, zoonotic, food borne, chemical, radio nuclear, or due to an unknown condition

\(^1\)Disease specified by IHR (2005) for immediate notification
3.1.2 Limitations of the disease prioritization

This exercise focused only on ranking exercises conducted for diseases under the purview of IDSP. However, quality assurance measures were put in place to mitigate any potential bias. The groups used their own assessment tools to provide their view as a consensus in terms of the relative importance of each domain in the scoring sheet for all diseases. Further, use of a single checklist enabled comparisons to be made across all the groups based on the principles of validity and reliability, regardless of the precise scoring criteria.

3.2 Session 5: Data collection tools for IDSP

*Session Chair:* Dr Sujeet Kumar Singh, DDG, Mental Health & International Health, MoHFW
*Co-chair:* Dr Pradeep Khasnobis, NPO, IDSP, NCDC

Two presentations were made in this session:

- Dr Saurabh Goel, Assistant Director, IDSP, NCDC highlighted that under presumptive surveillance, currently 96% of districts and 84% of reporting units were reporting on the IDSP portal. Challenges included—less representation from the private sector; presumptive diagnosis not mentioned in the register by medical officers; filling up of P Forms by pharmacists or even ward boys; difficulties in extracting data for P Form from illegible OPD registers; no mechanisms to check duplication of cases; limited capability to analyse data on state-specific diseases and in correct recording of laboratory tests in the line list. He stressed that the new P & L Forms could be designed based on reprioritization of diseases keeping in view programme deliverables. The P Form based OPD registers should be revived at all health facilities. More advanced specific data analysis tools should be integrated into the portal. Provisioning of regular training of medical officers, sensitization of district surveillance units (DSUs) and state surveillance units (SSUs) to analyse P Form data and introduction of GIS into IDSP Portal were other steps that were needed.

- A presentation on “L Form Data on the IDSP portal” was made by Dr Lata Kapoor, Joint Director, IDSP, NCDC. A line listing of positive cases in L Form, challenges in filling up of L Form as well as solutions were stressed in her presentation. She also highlighted additional diseases such as shigellosis, salmonellosis (non typhoidal), scrub typhus and anthrax that were being proposed for L Form.

**Key suggestions**

- Reprioritization of diseases in L Form
- Line lists to be generated directly from computerized systems/Health Information System (HIS)
- On-site data entry to prevent delays in reporting
- Cross notification of positive results tested in labs to get accurate geographical disease trends
- Trends to be generated from line list data, not absolute numbers
- Analysis of line list at all levels for outbreak detection – laboratory, district and state level
For data captured through vertical programmes, avoid duplicate data collection under IDSP establish IT enabled mechanisms to extract data needed for disease surveillance under IDSP, e.g. vaccine preventable diseases (VPDs) and Vector Borne Diseases.

Unique Identity (UID) for each patient to avoid the same case being captured more than once in the data.

### 3.3 Session 6: Information and communication technology for IDSP

**Session Chair:** Dr Sujeet Kumar Singh, DDG, Mental Health & International Health, MoHFW  
**Co-chair:** Dr Pradeep Khasnobis, NPO, IDSP, NCDC

Three presentations were delivered in this session.

Dr Suhas Dhandore, Assistant Director, IDSP, NCDC highlighted technical details like overview of the IDSP Portal, data entry functionality, HR details, training status, master data key functionality, IDSP dashboard and present status of IDSP portal.

Following was the proposed plan for upgradation of IDSP portal:

- Adoption of frameworks and standards to strengthen the HIS under IDSP
- Compliance to integrate e-governance standards in master data
- Revamping of IDSP portal to develop a GIS enabled software application, mobile technology for real time data collection and integration of SMS gateway and automated e-mail alerts
- Introducing basic and advanced web analytical features in the portal
- Redesigning of portal output, development of dashboard for real time visualization of data
- Decentralization of data entry up to health facility level
- Development of offline data entry module
- Interoperability of application for automated sharing of data among other MIS applications of disease control programmes.

A presentation on “An architectural approach to updating IDSP’s Integrated Disease Surveillance Information System” was delivered by Dr Ramesh S. Krishnamurthy, Senior Advisor, Health Systems and Innovation Cluster, WHO, Geneva. Two key factors for architectural approach – minimum data sets and appropriate use of standards-based ICT interventions were stressed.

Following components were highlighted for updating IDSP’s Information System:

- Resources (leadership, policies, financial and human resources, infrastructure)
- Indicators (morbidity, mortality, environmental risks, health resources availability and readiness, vaccine coverage)
- Data sources (common operational datasets, health facilities data, reports from subnational health management teams and coordination meetings, health workforce, human and animal surveillance, laboratories, data on stockpiles of medicines and commodities, financial data, etc.)
- Data management (collection, storage, quality assurance, processing, compilation, analysis and visualization of data and geospatial information presentation)
- A collaborative platform for information sharing
- Information products (situation reports, 3Ws (who does what, where and when), case summary statistics, media/communication reports, financial reports, health workforce distribution reports, etc.)

Phase-based upgrading of IDSP’s information system was suggested at all levels. Following are the recommendations for updating the IDSP’s Integrated Disease Surveillance Information System:

**Information systems and ICT:**

- **Develop or update**
  - Comprehensive information management master plan document
  - Comprehensive operations plan document to include data and information needs related to all activities and functions of IDSP at central and state levels
  - Update IDSP portal
  - Upgrade Central Surveillance Unit (CSU)’s information platform
  - Upgrade ICT of CSU’s strategic health operations centre (SHOC)

- **Fully upgrade** information systems and ICT infrastructure for SHOC at Central, state, and large municipality levels

- **Data for disease surveillance**: Update the following components for all diseases that are prioritized:
  - Case definition
  - Surveillance type
  - Surveillance data sets
  - Surveillance data collection standards
  - Adjust all reporting forms (P, L) to reflect the aforementioned components

- **Data display and visualization**
  - Design dashboard frame and its essential components
  - Identify surveillance data from other programmes/activities within the MoHFW for potential display in a common integrated disease surveillance dashboard
  - Develop agreements to obtain data from other programmes/activities and demonstrate a prototype dashboard

- **Data sharing agreements**

  Data-sharing agreements need to be put in place between various parties, including states, local governments and the private sector and all data sharing agreements must be updated.

Bruhat Bengaluru Mahanagara Palika (BBMP) experiences in software for IDSP were shared by Dr M.N. Lokesh, Chief Health Officer (Public Health), BBMP focusing on software application of BBMP – Public Health Information and Epidemiological Cell (PHIEC).

Following are the key features of the software:

- Online data collection
- Data collection from government and private hospitals
- Line listing of patients with GIS location
- SMS/e-mail alerts to MoHFW for confirmed cases
- Update from rapid response teams in the field
- Weekly reporting and emergency reporting
- Data on noncommunicable diseases and Syndromic Surveillance Form (S Forms)
- Outbreak/media alerts, VPD alerts
- Reports for MoHFW and epidemiologists
- Reports, charts on map
- “Thank you” e-mail, reminder SMS
- Hospitals in BBMP area that are GIS mapped
- Over 350 private hospitals given access to the application
- MoHFW and Health Officers have access to dashboards
- Auxiliary nurse midwives (ANMs) and health inspectors trained to update in the field for control and preventive actions.

Mr Lav Agarwal, JS, MoHFW appreciated the architectural approach for updating IDSP’s information system as well as BBMP’s software experience on IDSP.

3.4 Session 7: Recommendations and conclusions

Session Chair: Dr B.D. Athani, Special DGHS, MoHFW
Co-chair: Dr S. Venkatesh, Director, NCDC.

3.4.1 Key recommendations

- The reprioritization workshop identified 32 conditions as per weighted scores in a rank order of importance. However, apart from the 32 diseases, there was consensus among the experts to also include human rabies into the list.
- IDSP needs to update the following components for all diseases that are prioritized through the consultative process: case definitions; type of surveillance to be implemented for each prioritized disease; and minimum data sets and data collection standards for each prioritized disease. It also needs to make all relevant changes to the reporting forms to reflect the amendments.
- IDSP may advice all state SSUs to conduct similar reprioritization exercises to include diseases of importance at the state level.
- IDSP’s ICT platform and information management need to be upgraded to conform to the current standards. A comprehensive ICT and Information Management Master Plan document needs to be developed and maintained. The ICT Master Plan component needs to clearly define the computer network architecture at CSU level (including the data layer and application layer) while the information management document must contain all aspects of data management, including data privacy and confidentiality at both CSU and SSU levels.
- Two-level information architecture needs to be considered for disease surveillance management. Level-1 architecture should exclusively address the data and information exchange needs at the CSU level and give a clear articulation of the revised IDSP portal as well as the needs of Strategic Health Operations Centre. Level 2 architecture should address the data and information exchange at the SSU levels. Near real-time data collection approaches as well as advanced data analytics and visualization techniques must be considered as part of the architecture. A
A comprehensive Operational Document has to be developed to implement the aforementioned Master Plan with clearly articulated timelines, roles and responsibilities.

- Manage the IDSP data and information systems without interruption. Data sharing agreements need to be put in place between various parties, including state and local government levels and the private sector and all data sharing agreements must be updated.
- IDSP needs to identify all relevant disease surveillance aggregate data from specialized disease surveillance programmes for potential inclusion under a common integrated disease surveillance dashboard that will be administered by IDSP.

In his concluding remarks, Dr S. Venkatesh, Director, NCDC expressed his appreciation to the participants for their efforts in prioritizing the diseases.

In his closing remarks, Dr B. D. Athani, Special DGHS, MoHFW expressed his appreciation for the successful organization of this workshop. Dr Pradeep Khasnobis, NPO, IDSP, NCDC thanked all the participants for their active involvement in the workshop and dignitaries for their guidance in successful organization of the workshop.
## Annexures

### Annexure 1: Agenda

<table>
<thead>
<tr>
<th>Day 1 – 06 December 2016</th>
<th>Inaugural session: 10:00–11:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome address by Dr S. Venkatesh, Director, NCDC, MoHFW</td>
<td></td>
</tr>
<tr>
<td>Introduction of participants</td>
<td></td>
</tr>
<tr>
<td>Address by Mr Lav Agarwal, Joint Secretary, MoHFW</td>
<td></td>
</tr>
<tr>
<td>Address by Mr Sanjeeva Kumar, Additional Secretary, MoHFW</td>
<td></td>
</tr>
<tr>
<td>Address by Dr Henk Bekedam, WHO Representative, India</td>
<td></td>
</tr>
<tr>
<td>Address by Dr B.D. Athani, Special DGHS, MoHFW</td>
<td></td>
</tr>
<tr>
<td>Special Address by Professor (Dr) Jagdish Prasad, Director General of Health Services, MoHFW</td>
<td></td>
</tr>
<tr>
<td>Vote of Thanks by Dr Pradeep Khasnobis, NPO, IDSP, NCDC</td>
<td></td>
</tr>
</tbody>
</table>

**Session 1: 11:00–12:00 – Trends in surveillance systems and current status of IDSP**

*Chair: Dr B.D. Athani, Special DGHS, MoHFW*

*Co-chairs: Dr A. K. Gadpayle, Addl. DGHS, MoHFW and Dr K. K. Aggarwal, President-elect, Indian Medical Association*

<p>| Integrated disease surveillance programme (10 mins): Dr Pradeep Khasnobis, NPO, IDSP, NCDC |
| Surveillance review from GHSA in India (10 mins): Dr Sameer Sodha, CDC Resident Advisor, Epidemic Intelligence Service Programme, India |
| Surveillance models of Sri Lanka and Thailand (10 mins): Dr Vason Pinyowiwat, Technical Officer, WHO Regional Office for South-East Asia |
| Why disease prioritization of IDSP – the past and current status (10 mins): Dr Nishant Kumar, Assistant Director, IDSP, NCDC |
| Diseases under consideration for IDSP (10 mins): Dr Sanket V. Kulkarni, Assistant Director, IDSP, NCDC |
| Discussion and wrap-up (10 mins) |</p>
<table>
<thead>
<tr>
<th>Session 2: 12:00–01:00 – Disease prioritization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair: Dr S. Venkatesh, Director, NCDC, MoHFW</td>
</tr>
<tr>
<td>Co-chair: Dr Ramesh Krishnamurthy, Senior Advisor, Department of Information, Evidence and Research, Health Systems and Innovation Cluster, WHO</td>
</tr>
<tr>
<td>Disease prioritization methodology (30 mins): Dr Giridhara R. Babu, Additional Professor, Indian Institute of Public Health, Bengaluru</td>
</tr>
<tr>
<td>Instructions for group work and sample scoring exercise (15 mins): Dr Giridhara R. Babu, Additional Professor, Indian Institute of Public Health, Bengaluru</td>
</tr>
<tr>
<td>Discussion and wrap up (10 mins)</td>
</tr>
<tr>
<td>Lunch break – 01:00–02:00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 3: 02:00–05:30 – Disease prioritization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair: Dr S. Venkatesh, Director, NCDC, MoHFW</td>
</tr>
<tr>
<td>Co-chair: Dr Ramesh Krishnamurthy, Senior Advisor, Department of Information, Evidence and Research, Health Systems and Innovation Cluster, WHO</td>
</tr>
<tr>
<td>Formation of groups and ground rules for scoring (10 mins)</td>
</tr>
<tr>
<td>Group work on disease prioritization (180 mins)</td>
</tr>
<tr>
<td>Tea Break: 03:30–03:40</td>
</tr>
<tr>
<td>Discussion and wrap up (10 mins)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2 – 07 December 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 4: 09:00–12:00 – Presentation of findings and panel reflections</td>
</tr>
<tr>
<td>Chair: Dr P.L. Joshi, Ex Director, NVBDCP, MoHFW</td>
</tr>
<tr>
<td>Co-chairs: Dr D.C.S. Reddy, Ex Professor and Head, Department of Preventive and Social Medicine, Institute of Medical Sciences, Banaras Hindu University and Dr Pavana Murthy, National Professional Officer, Surveillance and Response, WHO Country Office for India</td>
</tr>
<tr>
<td>Presentation of group work (15 mins per group): Rapporteurs of working groups</td>
</tr>
<tr>
<td>Panel reflection (30 mins)</td>
</tr>
<tr>
<td>Tea Break: 11:00–11:15</td>
</tr>
<tr>
<td>Finalization of list of prioritized diseases (30 mins): Dr Pradeep Khasnobis, NPO IDSP, NCDC and Dr Pavana Murthy, National Professional Officer, Surveillance and Response, WHO Country Office for India</td>
</tr>
<tr>
<td>Wrap up (15 mins): Dr Pavana Murthy, National Professional Officer, Surveillance and Response, WHO Country Office for India</td>
</tr>
</tbody>
</table>
### Session 5: 12:00–01:00 – Data collection tools for IDSP

**Chair:** Dr Sujeet Kumar Singh, DDG, Mental Health & International Health, MoHFW  
**Co-chair:** Dr Pradeep Khasnobis, NPO, IDSP, NCDC

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&amp;L Forms (30 mins)</td>
<td>Dr Lata Kapoor, Joint Director, IDSP, NCDC and Dr Saurabh Goel, Assistant Director, IDSP, NCDC</td>
</tr>
<tr>
<td>Short, medium and long term plans (30 mins)</td>
<td>Plenary discussion</td>
</tr>
</tbody>
</table>

**Lunch break:** 01:00–02:00

### Session 6: 02:00–03:30 – Information and communication technology for IDSP

**Chair:** Dr Sujeet Kumar Singh, DDG, Mental Health & International Health, MoHFW  
**Co-chair:** Dr Pradeep Khasnobis, NPO, IDSP, NCDC

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDSP Information communication and portal</td>
<td>Dr Suhas Dhandore, Assistant Director, IDSP, NCDC (30 mins)</td>
</tr>
<tr>
<td>Information systems for IDSP – minimum data sets</td>
<td>Dr Ramesh Krishnamurthy, Senior Advisor, Department of Information, Evidence and Research, Health Systems and Innovation Cluster, WHO</td>
</tr>
<tr>
<td>Bruhat Bengaluru Mahanagara Palika (BBMP) experiences in software for IDSP</td>
<td>Dr M.N. Lokesh, Chief Health Officer (Public Health), BBMP, Bengaluru</td>
</tr>
</tbody>
</table>

**Tea break:** 03:30–03:45

### Session 7: 03:45–05:00 – Recommendations and conclusions

**Chair:** Dr B.D. Athani, Special DGHS, MoHFW  
**Co-chair:** Dr S. Venkatesh, Director, NCDC, MoHFW

**Recommendations**  
Dr Pavana Murthy, National Professional Officer, Surveillance and Response, WHO Country Office for India

**Concluding remarks**  
Dr S. Venkatesh, Director, NCDC, MoHFW  
Dr B.D. Athani, Special DGHS, MoHFW

**Vote of thanks**  
Dr Pradeep Khasnobis, NPO, IDSP, NCDC
Annexure 2: List of participants

**Professor A.C. Phukan**
Head of the Department Microbiology & I/c A.I. Laboratory
North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong
9402196194
dranilphukan@yahoo.co.in

**Dr A.K. Gadpayle**
Additional Director General of Health services, Ministry of Health & Family welfare, Govt. of India, New Delhi
986888188
akgadpayle@yahoo.co.in

**Dr Aakash Shrivastava**
Sr. Chief Medical Officer, National Centre for Disease Control
New Delhi
1123913148
dr.aakash.shrivastava@gmail.com

**Dr Ajay Kumar**
Consultant, Integrated Disease Surveillance Programme, National Centre for Disease Control
New Delhi
9968275024
idsp-dpa@nic.in

**Dr A.K. Pandey**
State Surveillance Officer
Uttar Pradesh
9454455490
ldspup@gmail.com

**Dr Amit Kumar Singh**
Scientist, Indian Council of Medical Research
New Delhi
8130108764
dramit.icmr@gmail.com

**Dr Ananya Ray Laskar**
Assistant Director, National Centre for Disease Control
New Delhi
9811178028
ananya.ray.laskan@gmail.com

**Dr Anil V.**
Assistant Director (Public Health)
Directorate of Health Services, Thiruvananthapuram, Kerala
9846021483
anilgovind@gmail.com

**Dr Arghya Pradhan**
State Surveillance Officer
Odisha
9439994857
arghyap1@gmail.com

**Dr Arindam Ray**
Country Lead, New Vaccines and Immunization Systems, Bill & Melinda Gates Foundation
New Delhi
919643107480

**Dr Arti Bahl**
Joint Director
National Centre for Disease Control
New Delhi
artichitkara@rediffmail.com

**Ms Arunima Mukherjee**
Lead Health Systems, Health Information Systems Programmes
New Delhi
9530707589
arunimam@gmail.com

**Dr Balkrishna Sopan Kamble**
Assistant Director of Health Services, Pune, Maharashtra
9637117971
drbskamble@gmail.com
Dr B.D. Athani  
Special Director General of Health Services  
Ministry of Health and Family Welfare  
New Delhi  
011-23061467  
bd.athani56@nic.in

Dr B.P. Dutta  
Epidemic Intelligence Service Officer  
New Delhi  
dutta_bp@rediffmail.com

Dr B. Virumbi Viduthalai  
Scientist D  
National Institute of Epidemiology  
Chennai  
9894726160  
vvirumbi@nieicmr.org.in  
massphp@gmail.com

Dr Charan Singh  
Director  
Rural Health Training Centre  
Najafgarh, New Delhi  
9654100345  
rhtcnajafgarh@gmail.com;  
charan688@gmail.com

Dr Chhavi Pant Joshi  
Deputy Assistant Director General  
(Environmental Health), Directorate General of Health Services Ministry of Health & Family welfare, New Delhi  
9871006992  
drchhavipant@gmail.com

Dr Chinmayee Das  
Deputy Assistant Director General  
Directorate General of Health Services Ministry of Health & Family Welfare, New Delhi  
9811911253  
drchinmoyeedas@gmail.com

Dr C.S. Aggarwal  
Additional Director  
National Centre for Disease Control  
csaggarwal@yahoo.co.in;  
epiddiv@gmail.com

Dr C.S. Moghe  
Epidemic Intelligence Service Officer  
New Delhi  
c_moghe@rediffmail.com

Dr D.C.S. Reddy  
Ex-Professor and Head of the Department, Department of Social and Preventive Medicine  
Institute of Medical sciences, Banaras Hindu University  
9559736368  
reddydcs@gmail.com

Dr Deepak Kumar  
Dy Surv Team Leader  
National Polio Surveillance Unit, WHO Country Office for India  
kumarde@who.int

Dr Dipu Lowang  
Epidemic Intelligence Service Officer  
New Delhi  
lowangd@ymail.com

Dr Dinkar Raval  
Deputy Director (Epidemic)  
Commissionerate of Health  
Gandhinagar, Gujarat  
9909966905  
dr.dinkar@outlook.com

Dr Fareed Zafar  
Epidemic Intelligence Service Officer  
New Delhi  
drfareeduzzafar@yahoo.in
Dr G. Arunkumar
Professor and Head, Manipal Centre for Virus Research,
Manipal Centre for Virus Research,
Manipal University, Manipal
9845584163
arun.kumar@manipal.edu

Dr Giridhara R. Babu
Additional Professor
Indian Institute of Public Health,
Bengaluru campus, Bengaluru
9845036197
ej epigiridhar@gmail.com

Dr G.K. Durairaj
Ex-Additional Director
Directorate of Public Health & Preventive Medicine, Chennai, Tamil Nadu
9176393980

Dr Harsha Vardhan B.
State Surveillance Officer, Karnataka
9449843151
ssubangalore@yahoo.co.in
ssuidspbangalore@gmail.com

Mr Haresh Patel
Data Analyst
WHO Country Office for India
New Delhi
patelh@who.in

Dr Henk Bekedam
WHO Representative to India
WHO Country Office for India
New Delhi
BekedamH@who.int

Mr Himanshu Sekhar Pradhan
Consultant, Surveillance
WHO Country Office for India
9810185474
himanshu.pradh@gmail.com

Professor (Dr) Jagdish Prasad
Director General of Health Services
Ministry of Health and Family Welfare,
Govt. of India, New Delhi
011-23061063
dghs@nic.in

Dr Jyoti
Assistant Director, IDSP, National Centre for Disease Control, New Delhi
9871787984
jyotidsp@gmail.com

Dr Kayla Laserson
Country Director, Division of Global Health Protection,
Centre for Disease Control and Prevention (CDC), New Delhi
8826611772
klaserson@cdc.gov

Dr K.K. Aggarwal
President-elect,
Indian Medical Association
hsgima@gmail.com

Dr Lata Kapoor
Joint Director, IDSP,
National Centre for Disease Control
New Delhi
9811214482
idsp-lab@nic.in

Mr Lav Agarwal
Joint Secretary
Ministry of Health and Family Welfare
Govt. of India, New Delhi
01123061195
9818778177
jslamohfw@gmail.com

Dr Leo Machado
Training Focal Person, National Polio Surveillance Unit,
WHO Country Office for India
machadol@who.int
Dr Madhup Bajpai  
Regional Team Leader, Uttar Pradesh  
National Polio Surveillance Programme  
WHO Country Office for India  
9935545659  
rcup@ntsuidia.org  
bajpaim@who.int

Dr Mahesh Waghmare  
Assistant Director,  
National Centre for Disease Control  
New Delhi  
9891117375  
drmahesh108@gmail.com

Dr Meera Dhuria  
Assistant Director  
National Centre for Disease Control  
New Delhi  
miradhuria@gmail.com

Dr Meghna Desai  
National Polio Surveillance Programme  
WHO Country Office for India  
New Delhi

Dr M.N. Lokesh  
Chief Health Officer (Public Health)  
Bruhat Bengaluru Mahanagara Palika  
Bengaluru  
9480683515, 9448242962  
drlokeshnagaraj@gmail.com  
bbmpchopublichealth@gmail.com

Dr Mohan Papanna  
Public Health Specialist  
Centre for Disease Control and Prevention (CDC)  
New Delhi  
8826020478  
moi1@cdc.gov  
mpapanna@cdc.gov

Dr Naveen Rastogi  
Epidemic Intelligence Service Officer  
New Delhi  
drnaveen.rastogi@gmail.com

Dr Nilesh Buddha  
Technical Officer  
WHO Regional Office for South East Asia  
New Delhi  
9958097017  
buddhan@who.int

Dr Nishant Kumar  
Assistant Director, IDSP,  
National Centre for Disease Control  
9810965991  
dr.nishant@gov.in

Dr Nivedita Gupta  
Scientist E  
Indian Council of Medical Research,  
New Delhi  
8447509008  
gupta@icmr.org.in

Dr Padmini Shrikanth  
Senior Medical Epidemiologist  
Global Disease Detection Program- India  
US Centers for Disease Control and Prevention  
New Delhi, India  
Telephone: +91-88266-11774  
Email: pks6@cdc.gov

Dr P. Gunasekaran  
Director, King Institute of Preventive Medicine and Research,  
Chennai, Tamil Nadu  
9840960225  
gunzking@gmail.com

Dr Pankaj Bhatnagar  
National Professional Officer, WHO NPSP  
National Polio Surveillance Programme  
WHO Country Office for India  
9810189025  
bhatnagarp@who.int
Dr Praveen Ganganna  
Epidemiologist, Integrated Disease Surveillance Programme  
National Centre for Disease Control, New Delhi  
9899813856  
praveenidsp@gmail.com

Dr Raghvendra Kedlaya  
IT Consultant, Bruhat Bengaluru Mahanagara Palika  
Bengaluru  
9844318585  
raghavendra@indigoinform.com

Dr Rajesh Yadav  
Public Health Specialist, Center for Disease Control and Prevention (CDC), New Delhi  
8800628397  
mdx5@cdc.gov

Dr Rajiv Tandon  
Technical Director- Maternal, Newborn, Child Health, Nutrition and Adolescent Health  
PATH India Office, New Delhi  
9811103305  
rtandon@path.org

Dr Rajul Gupta  
Armed Force Medical College  
8527389090  
rajulkgupta@yahoo.co.in

Dr Rakesh Roshan  
State Surveillance Officer, Himachal Pradesh  
9418485259; 7018989935  
idspnhmhp@gmail.com

Dr Ramesh S. Krishnamurthy  
Senior Advisor, Health Systems and Innovation Cluster  
World Health Organization, Geneva  
41798262472  
Krishnamurthyr@who.int

Dr Ranjeet Prasad  
Epidemiologist, Integrated Disease Surveillance Programme  
National Centre for Disease Control  
New Delhi  
rajdoct80@gmail.com

Dr Ruchi Jain  
Assistant Director, IDSP, National Centre for Disease Control  
9350152512  
ruchiidsp@gmail.com

Dr Sameer Sodha  
CDC Resident Advisor  
Epidemic Intelligence Service (EIS) Programme  
Centre for Disease Control And Prevention (CDC) , New Delhi  
9599196428  
ssodha@cdc.gov

Dr Samiran Panda  
Scientist F  
National Institute of Cholera and Enteric Diseases  
Kolkata  
9830908475  
andasamiran@gmail.com

Dr Sanjeev Dalvi  
State Surveillance Officer  
Goa  
9011025033  
gassu.idsp@nic.in  
directorhealth_goa@yahoo.in  
sfwbgoa@hotmail.com

Dr Sanket V. Kulkarni  
Assistant Director, IDSP, National Centre for Disease Control  
New Delhi  
7836026688  
sanket.kulkarni@gov.in
Dr Saurabh Goel  
Assistant Director, IDSP, 
National Centre for Disease Control  
New Delhi  
9312660900

Dr Savitri G.  
Joint Director/State Surveillance Officer & 
State Programme Officer  
NVBDCP  
Andhra Pradesh  
9100108475  
idsp.ssuap@yahoo.co.in  
jdcdpap@gmail.com

Dr Siraj Ahmed Khan  
Scientist E, RMRC  
Regional Medical Research Centre for 
North East Region  
Indian Council of Medical Research  
Dibrugarh, Assam  
03732381494  
9435032866  
sirajkhanicmr@gmail.com

Dr S.M. Raheja  
Addl Director General ( Public Health)_  
Directorate General of Health Services,  
Government of Delhi9718599009  
drsmrheja@gmail.com

Dr Sudhir Joshi  
Certification & VPD surveillance Focal person  
National Polio Surveillance Unit  
WHO country Office for India  
New Delhi  
joshisu@who.int

Dr Suhas Dhandore  
Assistant Director, IDSP,  
National Centre for Disease Control,  
New Delhi  
9818010235  
suhas.dhandore@nic.in

Ms Sujata Malhotra  
Data manager, 
Integrated Disease Surveillance Programme  
National Centre for Disease Control  
8800511314  
idsp-dmit@nic.in

Dr Sujeet Kumar Singh  
Deputy Director General (Mental Health & 
International Health Regulation)  
Ministry of Health and Family Welfare  
New Delhi  
8130255553  
sujeet647@gmail.com

Dr Suneet Kaur  
Epidemiologist, IDSP, 
National Centre for Disease Control, 
New Delhi  
drsuneet.idsp@gmail.com

Dr Sunil Gupta  
Additional Director & Head of the 
Department, Microbiology, 
National Centre for Disease Control 
New Delhi  
9810147553  
sunil_guptadoc@yahoo.co.uk

Dr S. Venkatesh  
Director,  
National Centre for Disease Control  
New Delhi  
011-23913148, 011-23946893  
dirnicd@gmail.com

Dr Swati Chaudhary  
Consultant Microbiologist, 
National Centre for Disease Control 
New Delhi  
drswatichaudhary.idsp@gmail.com

Dr Syed Manzoor Kadri  
State Surveillance Officer  
Srinagar, Kashmir  
9419010363  
kadrism@gmail.com
Dr Tanzin Dikid
Deputy Director,
National Centre for Disease Control
New Delhi
tanzindikid@gmail.com

Dr Vason Pinyowiwat
Technical Officer
WHO Regional Office for South East Asia
New Delhi
pinyowiwatv@who.int