Table 11: SWOT analysis of zoonosis surveillance – IDSP review, 2015–16

Strengths	Weaknesses
1. The existence of standing committee on zoonosis, Joint monitoring group on avian influenza, ICMR–ICAR joint task force for research and a programme for establishing Intersectoral coordination (ISC) for "One Health" approach under the Twelfth plan at the national level. 2. Appointment of veterinary officers at the state surveillance units. 3. Joint orientation training courses for both medical and veterinary officers organised by NCDC and Indian Veterinary Research Institute (IVRI). 4. Sharing of laboratory facilities between health and veterinary sectors for diagnosis of zoonotic diseases of public health importance.	1. Intersectoral linkages and mechanisms between the departments of public health, animal husbandry, and wild life need strengthening. 2. Only 8 out of 36 states have veterinary consultants under IDSP.
Opportunities	**Weaknesses**
1. Sharing of human and animal disease data between IDSP, NADRS and NADRES. 2. Establishing joint (medical and veterinary) response teams at district, state and National level.	1. India is a global hot spot for emergence and re-emergence of zoonotic diseases. 2. States and districts have weak health systems and poor laboratory network.

3.3.3 Vaccine preventable disease surveillance and response

Presently, in the context of VPDs, information is collected through IDSP and also through the Immunization Division, MoHFW, which has WHO support through the NPSP. There is need for both the surveillance systems to combine and join forces for data sharing and outbreak response to VPDs at district, state and national level.

District surveillance officers must share outbreak information with the immunization division for joint investigation to enable timely response. The WHO AFP/measles system must share their data with the district surveillance officers on a weekly basis at district, state and national level.

The WHO AFP/measles surveillance system is also supporting expansion of case-based surveillance systems to include other VPDs like diphtheria and pertussis in a phased manner across the country. This is another area for collaboration with IDSP.

Table 12: Total number of outbreaks (disease-wise) reported by all states – IDSP, 2008–15

State	Year								Total
	2008	2009	2010	2011	2012	2013	2014	2015	
Acute Diarrhoeal Disease	228	332	411	532	467	576	344	249	3139
Acute Encephalitis Syndrome	6	5	11	31	6	13	38	11	121
Acute Respiratory Illness	4	3	3	2	2		1		15
Anthrax	2	6	3	9	1	10	6	7	44
Chickenpox	12	45	47	70	100	121	96	96	587
Chikungunya	25	61	25	77	55	72	63	23	401
Cholera	20	34	34	58	94	96	38	22	396
CCHF				2	1	8	6	6	23
Dengue	12	20	10	57	160	130	113	65	636
Diphtheria	1	1	1	5	4	4	7		23
Dysentery		1	3	9			1	4	18
Enteric Fever	6	10	10	12	8	1	19	9	75
Fever with Rash								17	17
Food Poisoning	50	120	184	305	255	370	306	219	1809
Influenza A H1N1					5	1		4	10
Influenza A H3N2					1				1
Influenza B					2	1		1	4
Jaundice								14	14
Kala-azar	1		3	6	1	1		1	13
Leptospirosis	6	3	6	14	11	12	6	2	60
Malaria	11	24	37	80	42	42	53	27	336
Measles	40	44	94	177	110	89	191	186	931
Meningitis	2	3	1	2					8
Mumps		2	3	10	19	25	17	17	93
Pertussis			1			1	1		3
Rubella		1	3	1	6	7	12	10	38
Scrub Typhus	3	1	1	4	9	4	4		26
Viral Fever/PUO	32	39	41	88	138	272	150	34	794
Viral Hepatitis	28	31	24	99	93	99	81	48	503
Others	1	3	5	19	16	8	9	11	72
Total	553	799	990	1675	1584	1964	1562	1083	10210

There are eight VPD testing laboratories in the country with CMC Vellore serving as the reference laboratory. The collaboration across the two major systems, IDSP and NPSP, is needed on priority; some efforts of integration have been initiated at the national level.

Table 13: SWOT analysis of VPD surveillance – IDSP review, 2015–16

Strengths	Weaknesses
1. Involvement of government health infrastructure up to SC level. 2. Detects early warning signals for outbreaks. 3. Capacity for ground level public health intervention.	1. System not supported by supervision/monitoring plan. 2. Private sector involvement is not enough. Only Indian Academy of Paediatrics (IAP) connects with state surveillance units. 3. Limited laboratory support. 4. Only outbreaks are investigated, so epidemiological information on VPDs is limited.
Opportunities	**Threats**
1. Collaborate with other VPD surveillance programmes to ensure complete, consistent and quality data. 2. Collaboration with accredited laboratories. 3. HR at the district level can be utilized more efficiently.	1. Under reporting of cases leading to data quality issues. 2. Threat of delayed detection of outbreaks or their being missed. 3. Variability of data generation from different states limits the use of data for policy decisions.

3.3.4 Additional surveillance by IDSP

Foodborne and diarrhoeal disease outbreak response and surveillance

NCDC jointly with the Global Disease Detection India Centre initiated a pilot project to enhance laboratory and epidemiological capacity for foodborne and acute diarrhoeal disease (ADD) surveillance and outbreak response at the district and state level in 2013.

Two districts each in Tamil Nadu and Gujarat were identified for the pilot based on site level assessment of laboratory and epidemiological capacity. In each state, an IDSP state referral laboratory was selected to support the district level laboratories in microbiological identification and distribution, manage proficiency testing panels and mentor district laboratory.

Epidemiologic enhancement focused on strengthening the capacity of local public health officials to conduct and document systematic ADD/foodborne disease outbreak investigations, frequently with the involvement of an Indian Epidemic Intelligence Service officer. Laboratory enhancement focused on ensuring timely submission of clinical (stool) specimens. All four pilot districts have initiated routine laboratory-based surveillance of ADD patients.

While these are good initiatives, the learning and experiences must be shared with the larger group to adopt the best practices.

Surveillance of ebola virus disease

MoHFW, GoI took multiple steps to prevent ebola virus disease (EVD) and to promptly respond if a case is detected in the country. A 24x7 control room in the office of Director, Emergency and Medical Relief (EMR) was set up for providing information about EVD. The Joint Monitoring Group (JMG) at the MoHFW consisting of various stakeholders of different ministries under the chairpersonship of DGHS met frequently to discuss the evolving situation regarding EVD and review preparedness and response.

Guidelines for surveillance and contact tracing, hospital infection control, environmental control, clinical case management collection, storage and transportation of samples were prepared and uploaded on the websites (www.mohfw.gov.in, www.nicd.nic.in). Advisories were issued to state surveillance officers of all states/UTs, airlines, travellers visiting from/to affected countries and families staying in the affected countries.

Surveillance was established at points of entry for screening and tracking passengers from West Africa. SOP was followed for entry screening. The IDSP cell followed up contacts of medium and high risk persons with suspected EVD.

Around 4000 passengers were followed up for daily visits and over 100 samples were tested. Master trainers from 25 states and RRTs of all the states/UTs were trained at four regional training workshops. Mock drills, tabletop exercises and simulations were conducted during the trainings.

Infectious disease hospitals under IDSP

It was felt that reporting efficiency and generation of early warning signals would substantially improve if infectious/communicable disease hospital data are collected and analysed separately.

Thus, a separate network of infectious/communicable disease hospitals was planned within IDSP with the following objectives:

- Integrating infectious disease/communicable disease hospitals in the network.
- Making the network report for IDSP diseases.
- Reporting systems covering presumptive and laboratory confirmed cases.
- Surveillance information based on both outpatient and inpatient records.
- Data collection – real time/daily/weekly.

From amongst the major infectious disease (ID) hospitals, seven ID hospitals, namely Kasturba Hospital, Mumbai; Communicable Disease Hospital, Chennai; Sir Ronald Ross Tropical and Infectious Disease Hospital, Hyderabad; Infectious Disease Hospital, Delhi; Beleghata General and Infectious Disease Hospital, Kolkata; Infectious Disease Hospital, Ahmedabad and Infectious Disease Hospital, Bangalore, were included in the IDSP disease surveillance network to improve EWS generation by the disease surveillance network of IDSP.

3.4 Laboratory-based surveillance and response

Although a roadmap and action plan for strengthening IDSP laboratories exists, there is no national laboratory policy or strategic plan for overall strengthening of laboratories in India. The vision of strengthening the laboratory services lies in making laboratory-based surveillance the centre point and an important component of disease surveillance under IDSP. The vision of laboratories is fragmented between programmes and funding sources, leading to dispersion of available resources, including HR.

Though significant progress has been made, many gaps still exist. There is a much felt need for a holistic approach towards laboratory systems and laboratory systems management in the country under different vertical disease control programmes to bring cross-cutting in quality assurance, standard laboratory procedures and manpower utilization. There is requirement of revising the laboratory tests according to the disease conditions, as well for updating testing algorithms and SOPs.

For development/strengthening of district public health laboratories (DPHLs), there is provision to provide an induction training programme for manpower (including microbiologists) and strengthen infrastructure with respect to equipment and funding for laboratory tests as part of grant in aid (GIA) to procure diagnostic kits, consumables and contingencies and for handholding to establish functionality.

Presently, 105 DPHLs in 29 states have been strengthened. Data as per the project implementation plan (PIP) indicates that 214 laboratories need to be strengthened by the year 2016. Additionally, it is evident that there is a clear lack of a dedicated

officer and/or central or state units in charge of laboratory quality management, together with a total absence of clear national recommendations for quality documentation development. The IDSP laboratory must undertake laboratory confirmation of epidemic-prone diseases on a routine basis and ensure that a minimum set and number of tests are performed.

There is good scope for improving the national training modules for quality assurance (QA) (basic or advanced), including provision of detailed guidance for correct performance of internal quality control. Data/information management is a relatively weak component of the laboratory system. Despite these shortcomings, limited L form reporting exists in the form of notifications.

Although a biosafety manual already exists at IDSP level, basic behaviour of laboratory staff in some laboratories was inappropriate, indicating that the biosafety manual needs to be complemented by basic biosafety training.

In some states, DPHLs at district hospitals (DHs) are only conducting dengue testing; all other IDSP laboratory tests are practically not available. IDSP laboratories are functioning with already available equipment, space and a technician conducting dengue tests, and there are no microbiologists available.

Table14: SWOT analysis of laboratory surveillance – IDSP review, 2015–16

Strengths	Weaknesses
1. IDSP district laboratories and state referral laboratory network functional in many states. 2. Strong technical oversight by CSU. 3. Biomedical waste management rules in place. 4. Roadmap for strengthening IDSP laboratories and action plan for laboratory networking for diseases of public health importance. 5. Regulation of specimen transportation and waste management; disease notification/L form reporting. 6. Availability of guidelines and SOPs. 7. External quality assuranace (EQA) programme has started. 8. Good communications using IDSP IT network.	1. Limited availability and capacity of HR, especially. microbiologists; limited in-service training/continuing professional development. 2. Inadequate quality management system. 3. Regulation of IDSP laboratory needs strengthening. 4. Limited routine or outbreak testing of specimens for key pathogens, inadequate national laboratory standards in general and for biosafety. 5. No overarching national policy for health laboratories or strategic/ action plan for laboratory strengthening. 6. No inventory and limited integration/ networking of laboratories.

9. National accreditation body – National Accreditation Board for Laboratories (NABL).	
Opportunities	**Threats**
1. Update the IPH standards for PHC, district and state laboratories. 2. Strengthening the national laboratory system for emerging and re-emerging infectious diseases (more regional labs to share the burden). 3. Draft laboratory standards under Clinical Establishment (Registration and Regulation) Act, 2010. 4. Global Health Security Agenda (GHSA) – biosecurity, zoonosis, emerging infectious diseases, antimicrobial resistance. 5. Partnerships with disease control programmes and international partners to strengthen laboratory quality. 6. More utilization of professional societies – Indian Association of Medical Microbiologists (IAMM), Hospital Infection Society India (HISI), Infectious Diseases Society of India (IDSI). 7. International support through partners/nongovernmental organizations (NGOs). 8. Collaboration with other departments and ministries.	1. Need strong/functional laboratories under IHR-2005, which is a legally binding instrument for all WHO Member States. 2. Shrinking government budget for IDSP. 3. Suboptimal utilization of district laboratories by clinicians. 4. Unreliable/poor quality and delayed reports can further reduce importance of laboratory testing. 5. Lack of laboratory confirmation can impact timely containment of outbreaks.

3.5 Management–communications and information technology

While IDSP's making the first attempt to gather data from over 674 districts has been a tremendous achievement, the information system is outdated and needs substantial upgrades at all levels.

IDSP requires a comprehensive information management master plan, as well as implementation strategy to address current data and information needs. The IDSP portal needs to be upgraded to match the changing needs. The ICT equipment supplied with satellite connectivity by the Indian Space Research Organization (ISRO) and NIC is about 10 years old. There is high repair and maintenance cost of present ICT equipment. These need immediate replacement with recent/updated and more cost-effective solutions. Additionally, there is a requirement to redesign the portal output with improved surveillance deliverables for interoperability and usability of data.

3.5.1 Present difficulties in ICT under IDSP

- Old ICT equipment at all levels.
- Satellite connectivity equipment is about 10 years old; often breaks down, leading to lack of data reporting from certain hard-to-reach states.
- High repair and maintenance cost of current ICT equipment; needs immediate replacement with latest and more cost-effective solutions.
- Outmoded concept of training centre and data centre for peripheral sites; data centres need to conform to modern ICT standards.
- Routine data management at SSUs and CSU needs substantial improvement to meet the demands of surveillance and response capacities at district and sub-district levels.
- Maintaining the IDSP master dataset has been an ongoing issue as they are both complex and exhaustive; needs a data management unit with improved data management software application along with sufficient onsite training for data utilization.
- Severe lack of integration of data from multiple vertical disease control programmes and lack of interoperability between various electronic information platforms, making them not very useful in collective decision-making during emergencies.
- Reactivation of call centre number 1075 is urgently needed along with the appropriate documentation of information as part of the IDSP master dataset.

The strategic use of eHealth and mHealth should be encouraged at the district with information flowing in to the portal at the state and national levels.

In order to capitalize on the potential of ICT and innovation, it will be critical to agree on standards to ensure interoperability of systems. Health Management Information Systems (HMIS) must comply with these standards at all levels, including systems used to capture surveillance data for public health action. Data dictionaries, definitions of common terminologies and minimum data sets should be agreed on so that surveillance information can be collected consistently, easily and not misrepresented. In addition, Central and state policies on health data sharing should ensure that data protection, privacy and consent are managed consistently.

IDSP's ICT approach for designing a common information system should be driven by best practices in information architecture and interoperable platform approach and integration of disease-specific information systems through the use of health data and health information standards. The use of innovative technologies to collect, collate, analyse and intervene in a timely manner to prevent or contain outbreaks is essential. The use of geographic information systems, augmented with advanced data analytics and visualization is necessary to monitor epidemics and contain outbreaks. IDSP should fully capitalise India's innovations in information technology. Mobile health applications as well as geospatial epidemiological techniques in data visualization need to be incorporated.

The current situation of absence of predictive analysis of IBS information is due to excessive reliance on HR for analysis that could be possibly replaced through automation of the web portal or through mobile-based platforms.

IDSP should fully utilize the mobile telephone platforms (mHealth) for effective collection of syndromic surveillance data for EWAR. Since most frontline health workers have personal mobile telephones, an innovative way to reward their use of telephones for IDSP needs to be explored such that health workers can upload information in near real-time from their place of work. An approach such as this would allow monitoring of emerging infectious disease threats and effective mitigation strategies. In addition, such mHealth platforms can allow all data from S forms be entered directly to the CSU's IDSP portal, making it easy for data submission and analysis.

Similarly, presumptive surveillance and laboratory surveillance can also be automated by geotagging health facilities and the laboratories using health data standards. The process of risk assessment and risk communication is not systematic in the IDSP programme. Often, the outbreak investigation reports are incomplete and not useful for analysis of monitoring and evaluation of the outbreak response process. The web portal should be enhanced to include outbreak investigation and closure modules along with the existing EWS module. The system can also be utilized to register rumours and track events. These risk assessment modules can produce epidemiological analysis for the field RRTs and dashboard

information for programme managers and decision-makers.

IDSP's MSVC has been using the web for retrieval of media alerts and also possible event alerts from curated and moderated sites like the HealthMap and ProMed since 2008. Some of the SSUs and DSUs have also started undertaking media monitoring; however, the use of web technology remains limited. Currently, there is a need and opportunity to develop protocols for the use of ICT in the context of event identification and reporting, as well as for utilization by SSUs and DSUs. There is lot of manual triangulation that happens at the surveillance units, which is often incomplete. ICT solutions can be used for triangulating information from IBS, EBS, surveillance systems of animal health, NVBDCP and from the Department of Food and Water Safety.

The states of Telangana and Andhra Pradesh have tried pilots of mHealth SMS based reporting in the past and lessons learnt from these pilots may be reviewed for piloting mHealth-based syndromic surveillance in states where such an approach is feasible.

Recent advances in web analytics should also be used for identifying clustering in time and space by geotagging health facilities and villages. Web and mobile-based solutions can also be customized for providing decision-based recommendations, along with alerts. These solutions should be piloted in states that have completed geotagging of health facilities up to village levels, such as in the states of Chhattisgarh and Karnataka. IT solutions should also be used for customizable dashboards and decision boards for policy makers and public health managers. The state of Andhra Pradesh SSU is producing a dashboard with IDSP information for the Chief Minister. Event-based surveillance is still in the nascent stages in most of the country's states and districts. IT solutions can be used for event-based reporting using mobile technology from stakeholders that have largely been out of the IDSP network, e.g. private practitioners, hospitals, veterinary health departments, NGOs and community groups.

IDSP requires more collaboration on aligning data collection and reporting methods with key stakeholders. Data analysis is a weak component at the state and district levels. There is poor supportive supervision and communication at district and state level and a SOP for a feedback system is not available. Thus, the response mechanisms remain weak and cannot adequately identify areas and issues for action. For influenza, more harmonization is required between the NCDC and ICMR influenza networks for a uniform comparable minimum dataset on influenza. Trend analysis of IDSP diseases is not shared as appropriate among stakeholders. Information sharing with key decision makers at the state and national level needs strengthening.

Table 15: SWOT analysis of ICT solutions – IDSP review, 2015–16

Strengths	Weaknesses
1. IDSP led the computerization of public health surveillance data collection from districts, states and UTs to national level. 2. The existing telecommunication infrastructures at the level of districts and sub-districts are still functional in many states and districts. 3. Video conferencing facility is functional in many states. 4. The IDSP portal became an example of a national health information network.	1. Under best-case scenario, there is still a lag time of 8–10 days for data collection and submission to IDSP portal due to various reasons. 2. Data collection is limited to counts of cases and aggregates. Only the "when" and limited information of "where" – the reporting unit – is known and this data has limited use. 3. Since IDSP data is based on aggregate with no gender information, the "person/who" is completely missing; need to move to selective case-based data collection. 4. Insufficient or lack of data analytics for use at SSU, DSU and block levels. 5. Substantial number of data entry posts are vacant; need to be filled. 6. Additional qualified data analysts are needed at CSU.
Opportunities	**Threats**
1. Maximize the use of ICT innovations (mHealth and eHealth) to conduct public health surveillance at block and village levels. 2. Align IDSP information systems efforts with mission mode projects on e-Governance and Digital India. 3. Utilize mHealth/SMS based data collection and reporting for IDSP surveillance activities. 4. Some states have mobile based reporting for MCH programmes. 5. IDSP's current mandate is ideal for effective data collection by leveraging India's IT innovations. 6. Analysis should be preferably at block level but HR with capacity to do the needed analysis is lacking.	1. Resistance to change by the health functionaries.

3.6 Management – governance

Public health surveillance is a core function of the health system. However, most of the staff at the state and district surveillance units and some staff at central surveillance units are recruited on contractual positions. The review revealed that the programme does not get the priority it deserves in the NHM reviews at all levels. IDSP is unable to routinely produce quality information to guide policy development and programme management or to monitor trends of health-related events or diseases.

Although medical colleges have a crucial role in IDSP, they are significantly underutilized. Most of the medical college hospitals are only involved as a reporting unit and/or a DPHL, referral laboratory. During the FGDs, staff at the medical college hospitals expressed their willingness to be utilized in training and supportive supervision of the programme.

For IDSP effectiveness during public health emergencies, it is required to have adequate legislative support for complete and prompt reporting from all sectors. However, existence of appropriate legislative instruments and use of legislative provisions for improved reporting is weak in most states. The states need to enact or to implement legislations, e.g. the Clinical Establishment Act (CEA) and Public Health Act that can strengthen the programme's ability to make reporting on listed diseases mandatory.

Epidemic intelligence and supportive supervision functions by the surveillance unit staff requires them to be adequately mobile. Most of the field units felt that the support for mobility, such as the availability of vehicles and funds for fuel, was inadequate, except during periods of outbreaks.

One of the key governance mechanisms in IDSP is the surveillance committees at all levels. Evaluation showed that the surveillance committees at district and state level are underutilized. Most surveillance units do not have the members of the committee listed by name and contact details. The committee meetings are convened only during outbreaks and most of the time with inadequate quorum. Opportunities for utilization of the committees for risk assessment, emergency preparedness, routine programme reviews and intersectoral coordination are similarly underutilized. State and district surveillance committees in the form envisaged rarely meet and function, while it remains uncertain whether the constitution of these was ever attempted in many places. IDSP issues are clubbed along with other health sector agenda during the meetings of the district health society. The character of this meeting is seldom multi-stakeholder and level of review is very weak.

General administration does get involved when there are outbreaks to respond to – but most commonly as immediate response and less as an institution that holds a building and corrective role. The lack of demand for epidemiological data at district and state level, and the weak culture of the use of such information, are issues of inadequate technical capacity and governance. The predominant focus on national health programmes, where all elements of the programme are centralized, could be contributing to the failure in recording and responding to all disease control priorities not covered by these programmes. Furthermore, each national programme carries its own individual disease surveillance mechanisms.

During the review, it became evident that a small proportion of district hospitals had policy documents on IDSP. The mechanisms for routine monitoring, evaluation and supportive supervision are weak at the state as well as district surveillance units. In most of the visited states, there has been no identified mechanism for recognition of good performance.

Table 16: SWOT analysis of governance – IDSP review, 2015–16

Strengths	Weaknesses
1. Functional structure of IDSP in each state and district in the country. 2. Strong governance structures for the programme in the form of surveillance committees at each level. 3. Epidemic diseases act can enforce compliance in H1N1, malaria and dengue data. States can utilize these data when required.	1. The surveillance committees are not functional in most states and districts. 2. Overemphasis on the processes and no monitoring of the outcomes and impact. 3. Importance of surveillance in health planning and programme management for health assurance is not adequately realised by many stakeholders.
Opportunities	**Threats**
1. CEA is now being implemented in some states. 2. The programme receives political attention during times of disease outbreaks. 3. Programme now part of the NHM in the entire country. 4. Commitment for compliance of surveillance and response core capacity requirements of IHR-2005.	1. Low priority given to the programme due to competing surveillance components of other national programmes.

3.7 Management – Human Resource

Human Resource (HR) is a critical component of the programme. The key functions related to HR management in IDSP are contracting of the staff, training and development of manuals and guidelines. The Ninth Empowered Programme Committee of the National Rural Health Mission approved the proposal for contractual appointments of 766 positions (epidemiologists, microbiologists and entomologists) under IDSP at state/district levels on 03 January 2008.

A large proportion of the surveillance unit staff at all levels is contractual, ranging from about 60% at the CSU to 90% at the SSUs, with the exception of the states of Gujarat and Tamil Nadu where states have positioned some staff from the permanent cadre in the surveillance units. It is also noted that there is a higher vacancy status in permanent positions.

Table 17: Showing contractual vacancy position (as on December 2015).

Health Professionals	Total no. of sanctioned positions	In position	(% vacancy)
Epidemiologists	703	407	42.1
Microbiologists	173	116	32.9
Entomologists	36	27	25.0
Veterinary Consultants	36	8	77.8
Total	**948**	**558**	

Source: NCDC, 2015.

In a major policy shift in May 2010, MoHFW authorized all state health societies to recruit for these contractual professionals. A letter was sent to states/UTs for decentralized recruitment (D.O. No. T-18015/45/2010-IDSP, dated 26 May 2010). States were requested to extend existing contractual engagements subject to their satisfactory performance. The terms of reference/guidelines for contractual engagement for these posts were provided by CSU.

Table18: Showing sanctioned contractual vacancy positions under IDSP (as on December 2015)

Contractual Positions	SSU	DSU	Comments
Epidemiologists	1	1	42.1
Microbiologist	1	-	One each for DPL/DPHL
Entomologist	1	-	
Consultant (Finance)	1	-	
Consultant (Training)	1	-	
Data Manager	1	1	
Data Entry Operator (DEO)	1	1	One DEO per identified medical colleges, Premier Institutes & Identified Infectious Disease Hospitals

Source: NCDC, 2015.

Till 2010, the recruitment of contractual staff was centrally managed, followed by a major policy shift allowing the state health societies to directly employ. Some of the contractual positions were vacant in the visited units, reflecting the current nationally prevailing situation of vacancy percentages ranging from 17% for data entry operators to 42% for epidemiologists, as on 31 October 2015.

The more high focus and vulnerable the state, the more likely is it that posts will be vacant. In Chhattisgarh, only one out of 28 district posts are occupied. One major reason for is that the situation is that many states have mandated a minimum qualification of MBBS plus a MPH or MD, resulting in limited number of eligible candidates.

During the FGDs, many staff reported low remuneration for the position of epidemiologists as one of the reasons for poor attraction and retention. Moreover, although the remuneration is comparable to other regular MBBS graduates, their work is less prestigious and the position only contractual, and thus less secure.

To ensure that the skills of the personnel recruited under IDSP are up to date with the needs of the job, several types of training have been envisaged in a 3-tier arrangement. These include: Tier 1 – Training of trainers (TOT) programme; Tier 2 – Training of medical officers and other health staff at the CHC level by the master trainers at the district headquarters; and Tier 3 – Training of block medical officers who will train sub-block level staff and health workers.

An induction training package for epidemiologists has been developed for ongoing training. This is a self-learning CD version of the field epidemiology training programme. Training manuals for medical officers, paramedical staff (pharmacists, nurses) and data managers has been prepared and are available on the IDSP portal. The duration of training for surveillance staff ranges from 2 weeks for surveillance officers and epidemiologists to one day for staff at the reporting units and frontline health workers.

In some of the visited districts, the staff of health facilities were untrained, while most district surveillance units did not have updated information on training of their RRT members. The trainings of the RRT members, state and district surveillance units and master trainers are centrally coordinated in designated national institutes. This leads to a time lag in the training of staff in the states and districts.

During evaluation, many field functionaries were not able to articulate their job responsibilities. Partially, the reason for some of the staff in the surveillance units is the contractual nature of the job and responsibilities. The evaluators felt the need to optimise work through regular persons appointed in key positions and clearly define the core competencies and job description and responsibilities for each staff position in the programme.

Table19: SWOT analysis of HR – IDSP review, 2015–16

Strengths	Weaknesses
1. HR and funds sanctioned for each state and district surveillance unit in the country. 2. Dedicated training consultants within the structure of the programme up to state level.	1. The programme does not have a HR policy. 2. Core competencies required for different cadre of the staff not defined/updated. 3. Lack of performance evaluation mechanisms.
Opportunities	**Threats**
1. Public health cadre being enacted in many states and the programme can advocate for adequate provision for surveillance staff. 2. HR management portal in NHM, IDSP, Human Resources and Management (HRM can be integrated. 3. Distance education and web-based courses.	1. Overdependence on contractual HR. 2. Higher vacancies noted in permanent positions.

3.8 Management – finance

The IDSP continued under the 12th Five Year Plan period (2012-17) under National Health Mission (NHM) from domestic budget only. The 12th Five year plan fund allocation include for Central Surveillance Unit; Avian Influenza Component and State level disease surveillance programme. Human resource, training, ICT support, Laboratory Services and Infectious Disease Hospital Network are main activities in IDSP as per the 12th Five Year plan.

12th Five Year Plan approved allocation for IDSP is INR 6400.40 million for a period of 5 years from 2012-13 to 2016-17. The major share of 12th Five Year plan allocation of 84% was for the grant in aid (GIA) to State/UT for IDSP, 12 % was for Central Surveillance Unit and 4% was for Avian Influenza Component

IDSP budget was INR 630 million per year from 2011-12 to 2014-15 and it increased to INR 640.30 million in 2015-16. The cumulative approved budget of IDSP in the 4-year period from 2012-13 to 2015-16 is INR 2530.30 million which is 39.55% of the 12th Five Year Plan allocation with only one year remaining in the plan period. The gap in budget approved against what was allocated in 12th Five-year plan is INR 3880.40 million as on 2015-16.

The budget allocation from the Central Government to IDSP from 2012–13 to 2015–16 is around 40% of the approved allocation in Twelfth FYP. It is clear that the planned financial resource has not flown into IDSP.

Central Government financing may not increase with the increased devolution of net proceeds of union taxes to the states from 2015–16. Thus, governmental funds will hold a crucial role in the future financing of IDSP. Since IDSP functions under NHM, state governments are required to bring in the state share in the mission against the total approved PIP. However, the state share is not required to be specifically invested for each disease control programme and can be invested for any approved PIP activities, based on the discretion and preferences of each state. IDSP state share was received by only 33% of the states in 2014–15. Hence, the financing of IDSP from state share is not realized as planned. Finally, the states' own plan fund schemes for IDSP implementation also remain scarce.

The average fund utilization during the past three years reached 73% at the country level and 68% at the state level. District fund utilization in 2014–15 reached 84%. The available IDSP fund is not being utilized, although financial resource availability as compared to approved PIP was 73% in 2014–15. The average utilization of funds by the avian influenza surveillance laboratories for the period 2012–13 to 2014–15 was 45%. Grant-in-aid utilization shows a decreasing trend from 2013–14 onwards, declining from 71% in 2012–13 to 30% in 2013–14 and for 2014–15.

There are multiple factors that determine the fund utilization at various levels. Country level budget utilization depends on the release of funds to the states/UTs, which in turn depends on compliance by the states/UTs to the NHM requirements, such as submission of utilization certificate, audit reports, states share and more. CSU level budget utilization of GIA to avian influenza labs has also been low, reaching approximately 21%.

Non recruitment of staff is one of the major reasons for non-utilization of funds. Funds are released for vacant posts for 6-month periods. In case the vacancy is not filled up by then, these funds get blocked. States, which are not receiving state share, have a cash flow crunch due to which activities are not done and funds are kept for payment of salaries.

The time gap at present from release of funds from CSU to the actual receipt of funds is around 2–3 months. Considering a 25 days' processing time at CSU for release of GIA to the states, the total time required for receiving the fund after submission of the utilization certificate ranges between 3 to 4 months. Hence, states or districts need to park at least 4 months' expenses in the bank account to meet the expenses for the time gap in getting fund release. This strongly affects the fund utilization at the state level.

File processing time at the state level is another important factor. States that have a longer file processing chain take more time to spend money, leading to delay in all the other aspects of financial management, such as reporting and auditing.

Fund flow time gap from CSU to the state has increased to around 2.5 months in 2015–16 relative to 2012–13. This is due to the decision of the Central Government to change the fund flow route from direct transfer to the state health society to transferring funds to the state government. The timely compliance of release conditions by states is now of paramount importance since any slippages would lead to further delay in receipt of funds.

Financial management at the state level remains under the NHM. State-level financial guidelines and rules are also applicable to NHM, which makes the framework wide and non-uniform. Hence, in general, the financial management system of IDSP will have the same strengths and weaknesses as the financial management of NHM.

Loan is taken by IDSP state units from the state health society in order to manage the cash flow time gap. Analysis of the financial management report (FMR) of the first quarter of 2015–16 for eight states indicates that 37.5% of the states have taken up loan in the first quarter.

Audit findings reported by auditors of state IDSP units indicate that in around 60% of the reviewed sample-based audit reports, there is a clear weakness in the accounting and internal control system, requiring further action. There is a notable gap between the financial resources planned to be invested in the sector and the actual financial resource flow. In order to achieve IDSP's objectives, it is essential to ensure the input of financial resources as envisaged during the Twelfth FYP. In view of the above results, states' share for IDSP needs to be brought in to ensure that the required financial resources are available, while supporting the availability of adequate funds at all times with state units.

In view of the pivotal nature of IDSP activities and the limited availability of financial resources, the release of states share for IDSP needs to be made mandatory. With the aim of further increasing the financial resources, state share percentage for IDSP may be gradually increased to 30% of the GIA released from the GoI in a period of 2 years with 2.5% annual increase.

State plan schemes for IDSP need support for the activities and may not be covered from the GoI funding. State plan funds for IDSP can be a recommendation under the state PIP and the plan scheme funds for financing the state specific activities.

Table 20. SWOT analysis of finance – IDSP review, 2015–16

Strengths	Weaknesses
1. Financial management at state level is under NHM and has a well-defined framework. 2. IDSP financing through domestic budget support in the Twelfth FYP.	1. Central Government financing may not increase with the increased devolution of net proceeds of union taxes to the states from 2015–16. 2. Financing of IDSP from states' share is not happening as planned. 3. Grant in aid utilization shows a decreasing trend. 4. Non-recruitment of staff leading to blocking of funds. 5. The time gap at present in release of funds from CSU to the actual receipt of funds is around 2–3 months. 6. Audit findings have often reported weaknesses in the accounting and internal control system.
Opportunities	**Threats**
1. Training and mentoring of colleagues through better performing financial consultants. 2. Dedicated budget should be earmarked for IDSP. The possibility of converting from a Centrally sponsored scheme to Central sector scheme should be explored.	1. Low priority accorded to IDSP within the DCP budget. 2. IDSP Central Government budget from 2012–13 to 2015–16 is around 40% of the approved allocation in the Twelfth FYP.

4. Recommendations and action plan

Table 21. Overall surveillance and response

Short term	• Developing an updated surveillance manual for IDSP. • Formation of a surveillance committee under MoHFW. Define members of the task force. Define terms of reference (ToRs). Meet on periodic basis. • Prioritization of diseases for surveillance. Form an expert consultation workshop to develop and agree on disease/disease group-specific objectives; develop and agree on criteria for prioritization of diseases and to apply criteria and revise list of diseases; conclude on surveillance deliverables. • To report on trends of public health importance for India regarding communicable diseases in an appropriate manner to key stakeholders and foster transfer into public health action; communicate the results through web portal outputs for various audiences and ensure regular updates; improve and expand on existing communication channels; hold or participate in various annual meetings to present results and contribute to an improved annual epidemiological report (consider monthly or quarterly report). • To have a system for QA and control of the surveillance data in place and work towards comparability of data between all reporting surveillance data; develop a self-assessment tool for surveillance systems; develop a tool to evaluate the quality of data in surveillance systems.

Medium term	• Consultation workshop to develop principles of collaboration on data exchange across the human and animal sectors. Procedure on collaboration and aligning data collection and reporting methods with key stakeholders. • Develop and implement protocols for sharing of data and information for action between surveillance units and stakeholders of the programmes at district state and central levels. • Strengthening epidemiological and laboratory analysis on data; develop regular analysis of the L form data which is appropriate for the respective disease; develop advanced methods of analysis and integrate new analytical approaches to identify areas and issues for action; build competency for more detailed actionable analysis at the district, state and central levels. • Systematic cross-pollination and scale up of best practices from the field. • Foster the principle of information for action; promote its use by policy makers of the main conclusions from surveillance reports; reach out to the requirements of partners that use IDSP data. • The network of infectious diseases hospitals may be extended for other infectious diseases hospitals in the country in a phased manner.
Long term	• Develop data quality management and assurance protocols for data being captured under IDSP including presumptive, laboratory and epidemiological data; study and implement recommendations on how to improve the comparability of data; implement recommendations to improve comparability of data and procedures for assessing under reporting.

Table 22. Surveillance and response – indicator based surveillance

Short term	• Revision of case definitions to discuss and agree on new definitions (if considered necessary); a network committee approves new definitions (if considered necessary) and promotes implementation of the standard case definitions.
Medium term	• Develop disease-specific contact points or task force members. • Explore integration of data with NVBDCP for dengue, chickungunya and AES, and NPSP for AFP, measles and VPDs. • Through experts, explore the possibility of inclusion of death and minimum epidemiological data identified through experts in the L form data.

Long term	• Explore for diseases under elimination/eradication for monitoring. • Surveillance committee to implement and expand on GIS, introduce signal detection algorithms and modules, develop links to other databases and data sources and find ways and means to develop accessibility to the databases by the general public. • Pilot one to two sentinel sites per state for data through electronic health records for case-based data for selected priority diseases.

Table 23. Surveillance and response – event based surveillance

Short term	• Have procedures and tools in place to monitor and assess early threats detected through event-based surveillance. • Review and revise content of all manuals, guidelines and SOPs for strengthening EWAR–EBS component. • Develop mechanisms to routinely report communicable disease threats through the EWAR system. • Develop good communication systems that ensure that the right information for action is reported and disseminated to policy makers, key technical stakeholders and the general public, thus facilitating the transfer into public health action. • Rationalizing and increasing HR for EBS at the central and state surveillance units. • Systematic state-wise compilation of best practices for EBS from the field and list of all possible additional sources of information for EBS. • Develop guidelines for media scanning and verification at the central and state surveillance units. • Strengthen participatory rapid appraisals (PRA) techniques for involvement of accredited social health activists (ASHAs) and auxiliary nurse midwives (ANMs) for IDSP.
Medium term	• Expand the reporting network to the private sector. • Establish information sharing linkages with the other disease control programmes/allied health sectors. • Upgrade the portal for maintaining the event/outbreak tracking list.
Long term	• Strengthen digital disease detection at the surveillance units: o Expand on the syndromic surveillance data, e.g. through emergency department data as the electronic health records (EHR) uptake increases. o Use social media information from urban areas for EBS. o Use interactive voice response (IVR) information for EBS.

Table 24. Special surveillance and response – influenza/zoonosis/VPDs

Short term	• Update the influenza pandemic and response preparedness plan • Make better use of influenza data collected through its sentinel sites with systematic epidemiological analysis. • Develop a standard training module on influenza for doctors and paramedical staff. • Influenza network must be explored to monitor other emerging/re-emerging infection and viruses such as MERS and Zika. • Explore data-sharing processes for more harmonization of the influenza surveillance systems between NCDC and ICMR networks. • Regular data sharing between IDSP influenza surveillance network and the IDSP surveillance units. • Need for baseline data with which to compare data from annual influenza outbreaks for pandemic preparedness and response. • Expansion and enhancement of the scope of the existing Joint Monitoring Group to undertake the monitoring of other zoonotic diseases of public health importance. • Scope and mandate of the Standing Committee on Zoonosis to be enhanced to advice on various facets of strengthening of the intersectoral coordination mechanism. • VPD surveillance systems, IDSP and the other through the Immunization Division, MoHFW to combine and join forces for data sharing and outbreak response to VPDs at district, state and national level.
Medium term	• Establish a zoonosis task force at state level to include Departments of Health, Animal Husbandry, Wildlife, Environment and Forests, Agriculture, Food Safety departments, and the State Surveillance Committee, under the IDSP. • Expansion of the laboratory network for zoonosis to all states in a phased manner. • Development of operational guidelines for establishing intersectoral coordination, surveillance and monitoring and proposed integration of IDSP, NADRS and NADRES.
Long term	• Strengthening of sentinel surveillance to include typing and sub-typing of Influenza viruses. • Introduction of virus isolation by cell culture at least in a few laboratories. • Mutual sharing of data on priority zoonotic diseases with IDSP, NADRS and NADRES.

Table 25. Laboratory and response

Short term	• Develop a vision and advocate for strengthening laboratory-based surveillance with adequate funding. • Facilitate development of national strategic action/operational plan for laboratory surveillance. • Collaborate with professional societies/associations of laboratory professionals such as Indian Association of Medical Microbiologists (IAMM), HISI, and IDSI for strengthening laboratory surveillance.
Medium term	• Strengthen diagnostic capacity of IDSP laboratories: o Improve IDSP laboratory testing. Review/revise laboratory tests, methodology and formats. Standardise testing algorithms and SOPs. o Strengthen quality systems for IDSP labs. Review/revise laboratory standards for IDSP laboratories. Strengthen laboratory QA. Establish IDSP/NCDC laboratory for QA. Coordinate EQAS. o Implement resource mobilization plan to strengthen laboratory surveillance and ensure adequate financial resources. o Review, develop and disseminate advocacy resources for laboratory strengthening. • Strengthen/upgrade laboratory infrastructure, space and HR: o Review existing lab infrastructure and develop/implement plan for strengthening infrastructure of IDSP labs. Establish lab networking within and outside IDSP. o Strengthen logistics at state level. Develop guidelines for state level procurement of lab supplies. Review/revise/develop guidelines and training resources for laboratory logistics, inventory management, equipment maintenance, sample collection, storage and transport. o Strengthen biosafety (and biosecurity) including biomedical waste disposal. o Improve collaboration and coordination with ICMR labs. Improve collaboration for data flow and reporting from public and private sector laboratory. Collaborate with professional societies/associations (IAMM, HISI and IDSI). o Coordinate with HR plan for laboratory HR development programmes and ensure utilization of IDSP labs. Establish IDSP/NCDC training laboratory. Develop roster of laboratory professionals.

	◦ Improve the use of laboratory data and information for surveillance and outbreak detection. Establish a laboratory information management system within IDSP laboratories.
Long term	• Monitor performance of IDSP labs. • Support the strengthening of the national laboratory system to tackle biosafety/biosecurity, emerging infectious diseases and antimicrobial resistance (AMR) through intersectoral collaboration. • Strengthen partnerships with disease control programmes and international partners to strengthen laboratory quality.

Table 26 Management communications and information technology

Short term	• Establish a National IDSP Health Informatics Workgroup with the mandate of producing a costed Information Management Master Plan and implementation strategy. • Based on WHO standards, produce a national framework and Public Health Emergency Operations Centre (PHEOC) for national and sub-national levels, implementation strategy and costed operational plan. • Adoption of WHO frameworks and standards to strengthen the Health Information System in ICT under IDSP including validity checks, outliers, data forwarding protocols. • Develop offline data entry module, macro-enabled excel sheets for data entry in areas of inconsistent Internet connectivity. • Use of video conferencing for review meetings up to district level. • Use of call centre for EBS and data integration into portal.
Medium term	• Implement the operational plan of the Information Management Master Plan through a systematic and phase-based approach. • Conduct national and sub-national needs assessment of PHEOCs. • Commence phase-based implementation or upgradation of emergency operations centres (EOCs) to conform to the national framework at all levels. • Enhance the IDSP portal to develop geographic information system (GIS) enabled software application, mobile technology and IVR system for real-time data collection and integration of SMS gateway and automated e-mail alerts. • Compliance to integrate e-governance standards in master data along with incorporation of International Classification of Diseases (ICD) coding for diseases under surveillance. • Introducing basic and advanced web analytical features in the portal within the scope of disease dynamics for better monitoring of the programme.

	• Redesigning of portal output, development of dashboard for real-time visualization of data and display of key indicators in the public domain. • User-friendly role-based model for the portal and provision of customized facility for enhanced surveillance of specified area and certain time frame.(e.g. post disaster daily surveillance of epidemic-prone diseases or preparation of village-wise disease profile). • Use of satellite connectivity in SHOC and in isolated, remote, hilly areas in the absence of terrestrial connectivity.
Long term	• Conduct third party assessment for quality and use of data at national and sub-national levels. • Consider phase-based implementation or upgradation of EOCs at all levels.

Table 27. Management – governance and HR

Short term	• Need to develop guidelines to systematically include the urban population in the IDSP network. • Establishment of a laboratory task force in MoHFW. • Improve accountability of those who collect and transmit the data. Improve clarity on use of information. • Streamline human and financial resources for laboratory strengthening. • Need for more expanded programme of immunization (EPI) training throughout the entire system—RRTs and short term EPI and 2-year Epidemic Intelligence Service (EIS) programme. • Develop mechanisms and protocols with good monitoring oversights for the involvement of medical colleges in the reporting of data to the IDSP network.
Medium term	• Re-assessment and definition of core competencies for all surveillance functionaries at all levels, including the RRTs. • Development and operationalization of a HR development strategy, with a component on training strategy for public health surveillance. • Operationalizing a HR management system within the portal. • Development and deployment of a portfolio of e-learning modules for different cadres of surveillance functionaries. • Develop and implement performance evaluation mechanisms for contractual staff. • Systematic documentation of states with public health cadre for surveillance and response systems, e.g. Gujarat and Tamil Nadu.

	• Involving the private sector through the Clinical Establishment Act (CEA) and signing of MoU with the Indian Medical Association (IMA) and the Indian Academy of Paediatrics (IAP). • Coordinated data sharing between the Immunization division in the ministry supported by the NPSP for VPD surveillance.
Long term	• Operationalizing a Public Health cadre to ensure inclusion of surveillance and response system HR. • Recruitment of staff to be expedited.

Table28. Management – finance

Short term	• Timely compliance with the conditions of the release of funds.
Medium term	• Management information reports may be prepared for further strengthening of the financial monitoring at CSU level analysis of consolidated FMRs of all states/UTs. GIA to avian influenza laboratory to be reviewed to identify reasons for low fund utilization by some of the labs and analyse if any changes are required in the quantum of fund release and financial monitoring.
Long term	• Improve outcome-based budgeting of IDSP . • IDSP to explore other fund sources in case of fund shortages. • Overall financial increase of country's GDP from the present 1.1% to be explored.