Introduction

Three years of implementation of IDSP has taught many lessons. In the course of implementation, a few practical modifications have been affected. This article looks at the implementation challenges of each of the activities originally planned under IDSP and the changes that occurred over this period as observed by...
the consultant in the course of his association with the project since March 2006.

**Administrative Structure of IDSP:**

In January 2007 the project was restructured to provide nearly half of the total credit (SDR 21.53 million) for urgent financing requested by Government of India (GOI) for Avian Influenza pandemic prevention and control.

The realization of operational ease has led to relocating the administrative unit located in the ministry of health and family welfare (under a Joint secretary) to National Institute of Communicable Diseases (NICD) under the leadership of its Director in 2006-07. This arrangement facilitated utilizing the services of about half dozen officers (epidemiologists, microbiologists and statistical officers) to support dedicated National Program Officer in ensuring enhanced technical support, improved state’s oversight and trouble shooting.

Under the project surveillance units have been established at national, state and district levels in 23 states covered under first two phases and the process is underway in phase III states. The operational manuals have been prepared and to a large extent the planned training of the health staff has been completed in these 23 states. An effort to enhance coordination with national disease control programs has begun with rationalization of fever reporting forms with the National Vector Borne Diseases Control program.

The project depended on state for technical human resources (complementing only information technology (IT) and support staff on contractual basis). Lack of ownership and quick turn over of the state staff was a challenge and hindering the pace of the progress of the project during first three years. Making IDSP as part of National Rural Health Mission has the biggest gain of 2007-08, leading to creation of 766 dedicated professional positions (Epidemiologist, Microbiologists, and Entomologists) under NRHM at central, state and district level. While it created a good opportunity for the professionals (especially Public Health /Epidemilogists), recruitment of qualified people and their orientation for the project activities is going to be challenge for the coming years.

**Project Implementation:** Project implementation has been lagging by about a year. Third phase states started activities only in later part of 2007-08. Training of phase I districts have been completed and those in phase II are near completion. Supplies of phase one is complete and that for phase II and III is decentralized. Adaptation of information technologies is taking shape, Call Center 24x7 (unique NO: 1075) is functional since beginning of 2008 and videoconferencing with most of the state headquarters is established. However the electronic online data entry, analysis and transmission have not yet begun.

**Establish and operate a Central Surveillance Unit (CSU):**

Central Surveillance Unit will support and complement the state surveillance units (SSUs): Central surveillance unit by now is well established and supported by dedicated NICD officers to the state for periodical visits. Most states were visited 1-2 times as against expected quarterly visits. The quality of review, trouble shooting and facilitating action needs to be improved.

Prepare national guidelines for disease surveillance, select priority conditions for surveillance, and standard case definitions for each of them and methods for surveillance: This task was completed in 2006, but some implementation hurdles like difficulty in collecting passive surveillance data, desegregation of data by age and gender were noted. Revision of syndromic (‘S’) and probable (‘P’) forms by including only select priority specific conditions and eliminating desegregation of data by age and gender recently would facilitate surveillance.

Coordinate timely transport of specimens to the regional, national and international laboratories: This task is happening as it used to before IDSP through NICD Microbiology section

Analyze data, identify epidemiological trends and prepare national epidemiological situation reports: The data is being received from about 250 districts of phase I &II states and periodical analysis is being done since third quarter of 2007-08. The first national epidemiological annual report (2006) is ready and the one for 2007 is getting ready.

Coordinate Quality Assurance Surveys: Base line quality of laboratories has been completed and internal quality standards along with waste management guideline have been shared. The quality of training by
master training institutes has been evaluated externally and suitable actions being taken on the recommendations. The key recommendations include more hands on training particularly in filing up the forms of reporting, better participatory teaching approaches, more exposure to real field situations and better involvement of the microbiologists/laboratory technicians.

Integrate and strengthen disease surveillance at State and Districts level:

A. State-level:

i) Establish state surveillance unit (SSU): Each State will establish a SSU headed by technical officer, supported by 3 technical consultants (training, finance and procurement) and 4 support staff from project (data entry operators-2, office assistant and accountant).

All the states in phase I and II have already established the SSU’s and most in phase III also have established the SSU’s. The major hurdle has been the continuity in the State technical officers. As it is a senior level post quick turn over is seen due to superannuation/promotion. It is also a fact that this level officer has many other responsibilities and hence not able to give more than 20-25% of his/her time for IDSP. As far as the contractual posts are concerned majority of them are filled up in Phase I and II but there is big turn over due to temporary nature of the post and low pay package. It has been very difficult to get public health consultant and the financial consultants at state level.

ii) The emphasis is on integration of disease surveillance activities, laboratory coordination, and involvement of private sector, non governmental organizations (NGOs) and community.

Most of the state level officers are struggling in settling their own house (Govt. set up) right, attention to surveillance activities; laboratory coordination and involvement of private sector etc are not getting priority.

iii) SSU will prepare and send weekly/monthly summaries of the disease situation to CSU.

While most SSUs in phase I & II have been able to send monthly collated surveillance information from their districts, only about half of them are sending weekly summaries to the CSU. However large numbers of districts are sending weekly reports directly to the CSU also.

iv) Train state and district level staff;

All the states in phase I have completed the training as per their PIP whereas most in phase II are nearing completion of training of staff as envisaged in PIP. All the states had initially given high priority to rural health staff @ one worker per sub-center and @ one doctor per PHC because of administrative convenience and no efforts were made to train hospital and dispensary doctors, nurses and pharmacists. Therefore the district, sub-district and major hospital surveillance is not really established. Realizing the limitation States like Tamil Nadu, Gujarat and Karnataka were able to complete the training of all the staff involved in surveillance activities in 2007 and demonstrate the utility. All states by now have realized the need for training of staff involved in IDSP from hospitals, doctors, pharmacists and laboratory technicians and male health workers in sub center and are planning for the same in the 2008 activities.

v) Implement periodical non-communicable disease surveys/and or their risk factors

The project has envisaged periodical household surveys by states (one third of states each year by rotation) once in 3-4 years. The surveys would capture behavioral variables (like smoking, alcohol consumption etc) to mount national/state specific advocacy and behavior change communication strategies. Negotiations between NICD and Indian Council of Medical Research (ICMR) took longer time than expected and the actual survey was delayed and likely to be completed by September 2008 for the first generation of 8 states.

vi) Support districts in data analysis, transport specimens, and outbreak investigations.

The SSU’s have been supporting outbreak investigations and specimen transportations. However, SSUs are still not in a position to support data analysis as the requisite software is not yet developed by the National Informatics Center (NIC).

vi) Oversee the implementation of IDSP, monitor quality of laboratory services etc.
Due to quick turn over of both the regular state surveillance officer (SSO) and the contractual technical staff the mechanism of oversight and monitoring of the laboratory services is poor.

**District level:**

i) Establish district surveillance unit (DSU): Each State will establish a DSU in each district headed by medical graduate with a background of Public health, supported by one microbiologist and 4 support staff from project (data entry operators-2, office assistant and accountant). The emphasis is on integration of disease surveillance activities, laboratory coordination, and involvement of private sector, NGOs and community.

All the states in Phase I & II and some in phase III have established DSU by now. District Vector Borne Diseases control Medical officers or a Deputy Chief Medical (Additional /Assistant) officer of Health at the District Chief Medical office (District Health and Family Welfare Office) has been given additional responsibility of IDSP. This again is an impediment for the progress of the project as the officer is able to give about one thirds of his time only. It is also a fact that most of these officers do not have public health background.

Lack of qualified microbiologists at the district level (except in Karnataka and Maharashtra) has left the oversight and coordination responsibility of laboratories loose. One thirds of the district are able to involve private sector that too on a small scale. Majority of the districts surveillance units with medical colleges have not been able to negotiate with them for a productive partnership for surveillance and improved diagnostic capabilities. Integrating the surveillance at the district level is a distant dream due to different developmental status of vertical programs like national vector borne disease control program (NVBDCP), national tuberculosis control program (NTCP) etc.

ii) Analyzing the surveillance data from the peripheral institutes and providing feedback.

Most of the districts are able to input the data online. Analyzing surveillance data and feedback during monthly meetings and on visit to the peripheral units has started in states like Gujarat, Tami Nadu, Karnataka, Uttarkhand.

iii) Train sub-district health staff

Training of the health staff at the primary health center (PHC)s and sub-centers has been completed in phase I & near completion in phase II. The staff (doctors, pharmacists and lab technicians etc) at the district and sub-district hospitals was taken up in late 2007 and being intensified in 2008.

iv) Initiate investigation of suspected cases/outbreaks & institute public health action.

Investigation of suspected cases and outbreaks has been initiated in majority of the districts. Identifying the outbreak from routine reporting (based on alert of more than expected cases) and taking investigation is still wanting. On outbreak investigation public health action is invariably taken.

v) Support for collection and transport specimens to laboratory networks

The specimen collection and transportation in a district is mainly done by the district staff.

vi) Responding promptly to the information provided by the community.

The system of recording the community information and responding is yet to be developed.

**Community Level:**

i) Notify the nearest health facility of a disease or health condition selected

There is no official formalization of community reporting, though sometimes community does report to the nearest PHC. Use of call center is limited to health staff only.

ii) Support health workers during outbreak investigations

Most communities do support during outbreak investigations for fear of spread of disease.

iii) Community mobilization and empowerment for community participation in containment measures.

Community mobilization and empowerment of community participation for containment measure is still a distant dream.
Strengthen data quality, analysis and links to action:

i) ‘Real-time’ on-line entry, management and analysis of surveillance data using computers, internet and www:

Real-time on line entry of data at the district level is happening in phase I & II districts. Collation, analysis using computers and internet is waiting for the development of appropriate software.

ii) Email services between CSU, SSU, DSU and laboratories and other stakeholders

E-mail services between CSU, SSU and DSU are established but need to stabilize. The laboratories and other stakeholders (medical colleges) are yet to have similar facilities.

iii) Rapid dissemination of health alerts to public, health staff and civil societies

Rapid dissemination of health alerts to public health staff and civil societies is being developed, through 24X7 call service center (1075). Videoconferencing facilities are established in state headquarters and the CSU is interacting with states periodically. Converting state units as teaching ends is under consideration.

iv) Quality assurance surveys of laboratory information

The mechanisms of quality assurance and control of laboratory information are being developed.

Improve laboratory Support:

Currently, laboratory capacity in India for diagnosis of infectious diseases is fragmented with some capacity at the National Institutes of Communicable Diseases, at the Indian Council for Medical Research and at Medical Colleges around the country. Presently, laboratory services exist in a number of categorical programs with limited coordination and, compounding the problem, there is no apparent perceived need for coordination or leadership at the national level.

There is no focal point within this mixture of laboratories to ensure services are available where needed and assure quality of testing. For example, there is no place that assures quality of rapid diagnostic kits purchased within the country. As would be expected in a country of great diversity, there is also great diversity of capability and capacity in laboratory services. States like Maharashtra and Karnataka have capability and have already embarked on building laboratory capacity for IDSP. Where laboratory services exist, there is a need to improve quality and to address fundamental problems in the system related to procurement and subsequent distribution of supplies. In general, limited testing should be offered at the district level. Peripheral health centers and sub-centers are often performing microscopy (AFB and malaria) should be left at that level. At the district level, testing of human specimens should be limited to those tests for which high quality rapid assays are available (e.g., dengue, leptospirosis). Presently, culture should be limited to those laboratories designated as “state” laboratories or facilities where there is a very clear demonstration of sufficient volume of specimens to retain the necessary skills. A process for quality assurance needs to be established at each site identified for laboratory strengthening.

1. The upgrading of laboratories at the state and district level to improve laboratory support for providing on time and reliable confirmation of suspected cases, monitoring drug resistance

2. The introduction of quality assurance system for laboratories:

3. Establishing External Quality Assurance System (EQAS):

IDSP had envisaged 4 levels of laboratories namely: L1 = Peripheral laboratories that will have diagnostic facilties for Malaria, TB, Typhoid and chlorination of well water and fecal contamination of water, L2= District Public health laboratories will carry out tests for Malaria, TB, Typhoid and chlorination of well water and fecal contamination of water primarily to confirm results from L1, and for quality control. They would also have oversight responsibility of L1 laboratories. L3= Regional/State laboratories will carry out all tests to confirm L1 and L2 results and for some state specific diseases (e.g. Leptospirosis, KFD, Anthrax etc). They would also have culture facilities for bacteria and viruses along with drug sensitivity studies. L4= Central and L4 reference laboratories for routine work and specific outbreak investigations.
Way Forward:

**Infrastructure strengthening:** Despite recent improvements, obtaining information regularly from the larger public hospitals and private sector from the urban areas still remains a challenge for the IDSP. The initiative started to rationalize the weekly reporting forms needs to be implemented to reduce the burden of nonspecific conditions on the surveillance system. More importantly, the ability to analyze and act on the information being generated is critically lacking especially at the district level. Frequent turn-over of state and district surveillance officers also slowed down the effective implementation of surveillance activities. To address this, a specialized cadre of epidemiologists - which was not originally envisaged under the project - has been strongly recommended by the Bank as well as Centre for Disease Control (CDC) teams that recently reviewed the project. Similarly, due to limited availability of microbiologists, the original plan for laboratory strengthening has been revised focusing on making 50 public health laboratories functional and link each district to such labs. The GOI has created positions of epidemiologists, Microbiologist and entomologists under the National Rural Health Mission (NRHM). The challenge is to fill in these posts urgently with motivated people and arrange for their induction training with necessary field epidemiology and microbiology training. Scaling down the laboratory strengthening component to make 50 public health laboratories functional during the next 6 months appears to be doable task. Piloting of disease surveillance in 4 metro cities needs acceleration to provide lessons for scaling-up urban surveillance in other cities.

1. **Outbreak response:**

   1. The enhanced reporting and investigation of outbreaks by IDSP is an important accomplishment of the project, and warrants recognition. However it will be important to further strengthen IDSP capacity for early outbreak detection by emphasis on prompt outbreak reporting to the district surveillance officer. Special emphasis is required on seeking such information from the health providers and different options such as giving mobile telephones to the sub center (SC) reporting units should be explored.

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2. In addition to enhancing detection and prompt reporting of outbreaks, determining the quality of outbreak investigations should be an essential evaluation component of the project. This will require expanded and standardized recording of information about outbreaks investigated: the number of cases and deaths, causative agent, timeliness of detection and response, results of systematic investigation, including epidemiologic characterization and determination of source(s), and public health response. In some states, it will also be important to improve coordination between IDSP and epidemiology cells/response units.

3. IDSP should invest substantial efforts to assure the proposed Call Center is effectively implemented. This will require strategic marketing of the system to the providers and health personnel in the area covered by the call center. It will also require links to SSU (DSU) for promptly evaluating the information, and giving feedback to the provider (e.g. expedited access to reference diagnostic tests, information about clinical presentation of rare conditions, access to limited therapy—e.g. diphtheria anti-toxin) and initiating appropriate actions. Information from calls should be routed simultaneously, not sequentially, to relevant SSU (for follow-up) and CSU (for information and to recognize cross-state outbreaks).

4. Media scanning can detect possible outbreaks, as well as identify rumors which need addressing. Although it can be the responsibility of an SSU to systematically monitor local newspapers, web pages, etc, media scanning can also be done by a contracted service. The benefit of a contracted service is systematic, prompt scanning which is not contingent on public health personnel; also, any items noticed can be routed immediately to the appropriate (and possibly multiple) district, state, or national units.

II. Conditions to be reported under IDSP

1. IDSP should continue to refine strategies for improving the interpretability of data by emphasizing a) reporting units/data sources most likely to provide usable and important information, b) enhancing specificity of case definitions, c) encouraging laboratory confirmation and laboratory reporting and d) encouraging consistency in reporting.

2. Continued collection of S form data from sub-centers reinforces community engagement with IDSP so that outbreaks at the village level will be recognized and reported through IDSP reporting channels; for a single SC data collection burden is not too high, and the proposed revision of S form to eliminate age and sex breakdown of cases will further minimize burden.

3. However, other reporting units (PHC’s, hospitals, private hospitals, medical colleges, ID hospitals) should report a revised list of conditions using more specific case definitions. Revision of P form may consider dropping non-specific and high volume conditions e.g. fever, ARI Acute Gastroenteritis (leaving cholera) etc. as they create a large burden of data collection on the system, but the data are difficult if not impossible to interpret.

III. Strengthen laboratory diagnosis of cases

1. Doctors in Hospitals with large load of outpatients do not generally demand for investigations to arrive at a diagnosis. The states need to promote utilization of existing laboratory investigations routinely and also make efforts to improve diagnostic capabilities in these facilities.

2. Routine specimen transportation (from outbreaks and hospitals) to the laboratories both in public and private sector system (especially L3, L4 and L5) needs streamlining.

3. Keeping vigilance on the quality of investigations in these laboratories by external quality assurance mechanism is equally important.

4. Promote reporting of laboratory confirmed data using laboratory investigations reporting forms (L-to L5 forms). Line listing of cases with positive laboratory tests, and adding a column for type of specimen (a cerebrospinal fluid (CSF) or blood culture result is quite different from sputum) will improve the utilization. IDSP should consider
collecting reports of positive tests for Hib, rotavirus, pneumococcus, and other salmonella species.

5. At the present, linkage of reports from clinical and laboratory sources is not feasible (outside of the individual patient record), so one may need to accept some degree of duplication in order to have information on the number of laboratory confirmed cases.

IV. Sentinel Reporting Units

1. Continue to implement initiatives such as urban surveillance and sentinel ID hospitals to target large and strategically located hospitals for special attention as reporting units. These sources are likely to draw more severely ill patients from a large population, thus efficiently providing “sentinel” information about a large area. In addition, they are likely to have, or can be supported to have, better laboratory and clinical diagnostic facilities.

2. Targeting reporting units such as strategic hospitals and laboratories is a reasonable priority in all sites, but it may be particularly important in states that are less advanced in their IDSP activities, so that at least some surveillance information is available for these areas.

V. Rapid completion of the network (both for data transmission and for video-conferencing) is urgently needed; getting the districts operational will be critical to realize the full impact for IDSP. Videoconferencing should be viewed as an “essential public health tool” for surveillance and for outbreak management. Once the system is operational at districts, there will be even greater opportunities for frequent communication without difficult travel.

References:

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