

INDIA
INTEGRATED DISEASE SURVEILLANCE PROJECT (Credit 3952-IN)
MID-TERM REVIEW
AIDE MEMOIRE
November 12-27, 2007

1. The Mid Term Review (MTR) of the Integrated Disease Surveillance Project (IDSP) was started with the implementation support mission undertaken by a World Bank team¹ with technical support from the World Health Organization and Centers for Disease Control (CDC), Atlanta during November 12-27, 2007. During the mission, visits were undertaken to Uttarakhand, Maharashtra and Karnataka states to assess on the ground implementation progress. The Bank team members also visited the states of Andhra Pradesh, Mizoram and Gujarat to review the social and environmental safeguards issues. In addition consultations were held in Delhi with nodal officers from 12 project focus states. The Bank team would like to place on record its appreciation for the strong political commitment to improve disease surveillance and openness to address implementation challenges shown by the Ministry of Health & Family Welfare (MOHFW) team led by Mr. Deepak Gupta (Additional Secretary), Dr. Shiv Lal (Director for the IDSP and National Institute for Communicable Diseases) and Mr. Pravir Krishn (Joint Secretary). The Bank team would like to specially thank the IDSP team that included Dr. R.L. Ichhpujani (National Project Officer for the IDSP), Dr. Jagvir Singh (Public Health), Dr. Shashi Khare (Laboratory Services and Avian Influenza), Dr Shah Hossein, Chief Medical Officer (Non Communicable Diseases and Information Technology), and project staff from the center and the focus states for the high quality technical discussions and highly informative field visits. The WHO team that participated in the mission included Dr. Sampath Krishnan, Dr. Yvan Hutin, Dr. Samuel and Dr. Ritu Chowhan. Dr. Sanjeev Upadhyaya, from USAID also participated in technical discussions and state visits. The mid term review also immensely benefited from the recent review of IDSP undertaken by the CDC.

2. The mission has successfully achieved its objective of initiating a comprehensive review of the project, working closely with MOHFW, the project focus states and technical agencies supporting the project such as WHO and CDC and identified immediate actions required to accelerate project implementation along with specific actions to complete the midterm review process during the next 3 months. The Bank team reported its findings at a wrap-up meeting, chaired by the Secretary, Health and Family Welfare, on 27 November 2007. This Aide Memoire summarizes the mission findings on the IDSP component. A separate Aide Memoire will be issued for the Avian Influenza Component. The MTR will be completed during the next 3 months taking in to consideration the progress in agreed immediate actions and implementation status of Avian Influenza, and will recommend any changes in project objectives and scope.

3. **Key Project Data**

Project Data	Project Performance Ratings		
<i>Board Approval: July 8, 2004</i>	<i>Summary Ratings:</i>	<i>Last</i>	<i>Now</i>
<i>Effectiveness Date: October 28, 2004</i>	Achievement of PDO	MS	MS
<i>Original Closing Date: March 31, 2010</i>	Implementation Progress	MS	MS
<i>Revised Closing Date (if relevant):</i>	Financial Management:	MS	MS
<i>MTR Date (Actual if completed):</i>			
<i>November, 2007</i>			
<i>Original Ln./Cr. Amt: US\$ 68 Million</i>			
<i>Revised Ln./Cr. Amt:</i>			
<i>Amount Disbursed: US\$ 10.17 Million</i>			

Ratings: **HS**=Highly Satisfactory; **S**=Satisfactory; **MS**= Moderately Satisfactory; **MU**= Moderately Unsatisfactory; **U**=Unsatisfactory; **HU**=Highly Unsatisfactory; **NA**=Not Applicable; **NR**=Not Rated

¹ Members of the mission were GNV Ramana (Task Team Leader, SASHD), Shanker Lal (Procurement), Mohan Gopalakrishnan/Arun Manuja (Financial Management), Ruma Tavorath, (Environment), S. Ojha and M. Gupta (Information Technology), Robert Martin (Laboratory Services-CDC Atlanta); Claire Broome (Consultant); K. Suresh (Public Health); Gowrinath Sastry (NCD Risk Factor Surveys), and Nira Singh (Program Assistant)

Summary

4. The project supports Government of India's efforts to strengthen the core public health function of improving disease surveillance in the country covering all the states in a phased manner. The project had a slow start and disbursed around 16% of the credit during the first three years of implementation. In January 2007 the project was restructured to provide nearly half of the total credit (SDR 21.53 million) for urgent financing requested by GOI for Avian Influenza pandemic prevention and control. Thus, the overall credit available for the originally envisaged project activities remained at SDR 25.37 million. The scope of this review is limited to the original project and another mission is planned for reviewing the avian influenza activities.

5. Under the project surveillance units have been established at national level, and at state and district levels in 23 states covered under first two phases. 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. The GOI's decision to locate the central surveillance unit at the National Institute for Communicable Diseases helped in ensuring enhanced technical support for the project and provided additional human resources for improved state oversight and trouble shooting. Efforts to enhance coordination with national disease control programs has begun with rationalization of fever reporting forms with the National Vector Borne Diseases Control program and agreement was reached with the National Polio Surveillance project to pilot enhanced partnership with IDSP in 10 districts.

6. Information on priority diseases is being regularly reported by rural primary health facilities from over 90% of 252 districts belonging to the 14 focus states. Many states have started reporting outbreaks and documenting responses, even though improvements are required in the areas of laboratory confirmation, and quality and timeliness of response. The non communicable disease risk factor surveys are in progress in 8 states and preliminary results are expected by March 2008. Baseline assessment of laboratories and external evaluation of training have been completed. With technical support from WHO, a two week training program on field epidemiology and epi-lab trainings have been developed and piloted. The scope of information technology services has been expanded by including (a) video conferencing which enables quick communication and prompt expert advice during outbreak situation; (b) establishing a national call center for reporting outbreaks; and (c) providing satellite connectivity to 400 locations where terrestrial networks weak. Following the GOI's decision to use services of National Informatics Centre (NIC) for integrating all information technology (IT) inputs under the National Rural health Mission (NRHM), services of NIC are being used for IDSP as well. So far, the NIC has supplied IT hardware to 524 locations out of which 92 and 173 sites respectively are connected either through broadband and satellite network. Software for data entry and analysis has been developed and the beta version is currently being tested. The NIC has awarded contract for operating a national call centre for reporting disease outbreaks by health professionals and this site is expected to be functional by January 2008.

7. 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 turnover of state and district surveillance officers also adversely affect the achievement of identifying disease outbreaks early and improving on the ground response. 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 requires to be revised focusing on making few public health laboratories functional and link each district to such labs. The GOI has initiated efforts in this direction by initiating actions to create positions of epidemiologists under the National Rural Health Mission and scaling down the laboratory strengthening component to make 50 public health laboratories functional during the next 6 months. Piloting of disease surveillance in 4 metro cities needs acceleration to provide lessons for scaling-up urban disease surveillance in other cities.

8. The project is now using the services of Empowered Procurement Wing of MOHFW for the centralized procurement instead of a procurement support agency. While these arrangements took some time to get streamlined, the final phase of procurement is currently underway. The findings of post procurement reviews carried out by the Bank for FY 2005-06 and field visits during the mission noted concerns about quality and end use of some equipment supplied under the project as well as weaknesses in decentralized procurement. It was agreed that a rapid assessment of supplied equipment would be undertaken to assess the magnitude of these problems and nodal officers will be more rigorously monitoring the decentralized procurement. As the expenditure levels are expected to steadily increase, agreements were reached on actions required to strengthen the financial management arrangements including preparation of consolidated audit statements, reconciliation of audited expenditures with those reported in the financial monitoring reports and orientation training to state surveillance officers and financial consultants.

Disbursements

9. The project has reported an expenditure of Rs. 421 million (USD 11.7 million equivalent) till September 30, 2007 and USD 10.63 million equivalent IDA credit has been disbursed including the Special Account advance of USD 7.01 million as of November 26, 2007. Claims for expenditure reported from January to September 30, 2007 aggregating to USD 4.7 million (gross), are in the pipeline.

Progress towards Development Objective:

Indicators	Measurement					
	Baseline Value		Progress To Date		End-of-Project Target Value	
	Number or text	Date	Number or text	Date	Number or text	Date
1. Number and % of districts providing monthly surveillance reports on time	93 districts included in National Surveillance Program for Communicable Diseases	10/26/2004	78% of districts (312 out of 399) covered in the first two phases are generating weekly surveillance reports mainly from the public primary facilities.	11/27/2007	>50% of the districts providing monthly surveillance reports on time	03/31/2010
2. Number and % of districts in which private providers are contributing to disease information	None	10/26/2004	19% districts (77) are reporting data from private sector and most of these are from Kerala, Tamil Nadu, Gujarat, Haryana, Uttara nchal Nagaland and Madhya Pradesh.	11/27/2007	at least 50% of reporting districts	03/31/2010
3. Number and % of laboratories providing adequate quality of information	None	04/04/2006	<1% of the L1 and L2 laboratories are reporting data and quality is variable. The External Quality Assurance has begun in 12 public health labs.	11/27/2007	>75%	03/31/2010
4. Number and % responses to disease-specific triggers assessed to be adequate	Not existing	10/26/2004	Weekly outbreak reporting started from September 2007 and around 50 outbreaks are being reported in October. The quality is however variable.	11/27/2007	>75%	03/31/2010

10. The overall progress towards development objective is rated “*moderately satisfactory*”. Despite a slow start and low disbursement, the decision to focus on few states has resulted in

improved reporting and private sector participation has begun on a modest scale (Table 1). Most states have also started listing outbreaks and documenting responses even though there is scope for improving the quality. More importantly, the GOI's recent effort to create a dedicated cadre of epidemiologists at district and state levels under NRHM will have a significant impact on decentralized disease surveillance envisaged by the project. Results from the first round of household surveys for non communicable disease risk factors are expected by March 2008. The disconnect between DO rating and low disbursement is mainly due to MOHFW's decision use services of NIC and ISRO on a single source basis due to which the USD 8 million expenditure incurred on these activities. At the request of GOI, the Bank is currently reviewing the possibility of reimbursing this expenditure if GOI is willing to enter in to separate contracts with the government corporations as per Bank norms. .

Component-wise Implementation rating

Indicators	Measurement					
	Baseline Value		Progress To Date		End-of-Project Target Value	
	Number or text	Date	Number or text	Date	Number or text	Date
1. IT software developed and operating through the national network established for the project	No software and networking	10/26/2004	Beta version of the software being piloted. Hardware supplied to 524 locations and connectivity established at 92 and 173 locations respectively through broadband and satellite.	12/27/2007	National IT network established for Integrated Disease Surveillance	03/31/2010
2. Number of state surveillance units established with adequate staff, IT hardware, linked to national network	Not applicable	10/26/2004	All Phase I & II states (23) (established state surveillance units	12/27/2006	All major states of India will have state surveillance units	03/31/2010
3. Number of staff trained in disease surveillance epidemiology and outbreak investigation	Not applicable	10/26/2004	1,558 members of district/state surveillance teams trained. In addition, over 18,000 medical officers, 78,290 health workers and 1411 lab technicians also received training in disease surveillance	12/27/2007	2500	03/31/2010

11. Based on the progress in intermediate outcome indicators presented in table 2 and detailed in annex 1, the implementation progress made by two components -- establishing and operating a central level disease surveillance unit and training for disease surveillance and action -- is rated '*satisfactory*'. Implementation of component on improving laboratory support has been very slow and hence rated '*unsatisfactory*'. The component on integrating and strengthening disease surveillance at state and district levels is rated '*moderately satisfactory*'.

Agreed Key Actions

12. The agreed key actions for different agencies involved in project oversight and implementation are presented below. Each section under detailed implementation progress has detailed set of actions.

MOHFW

Actions to be completed by January 31, 2008

- Share the comments and action taken report on the post review report for 2005-06.

Actions to be completed by March 31, 2008

- Ensure final approvals for creation of positions of epidemiologists and microbiologists at state and district levels under the NRHM.
- Confirm willingness to enter into contract with Antariksh Corporation for supply of satellite communication and video conferencing equipment and with National Informatics Centre Services Inc. for supply of computer hardware, software and support services in the model contract format of the Bank with justification for direct contracting/single sourcing.
- Based on the feedback received from the states on staffing, revise the final quantity of laboratory equipment to be procured for Phase II and III states .

Action to be completed by June 30, 2008

- Prepare a vision document clearly articulating the place of the IDSP and the proposed National Centre for Communicable Diseases (NCDC) within NRHM as well as the new urban health mission.

Central Surveillance Unit

Actions to be completed by January 31, 2008

Share consolidated audit reports for FY 2006-07 that includes expenditure for both CSU and SSUs reconciled with FMR submitted along with state-wise audit observations

Actions to be completed by March 31, 2008

- Clearly delineate functions and operational responsibilities within CSU senior staff with a monthly reporting of progress in the agreed work program to the Project Director and National Project Officer
- Arrange training on FM for state surveillance officers and as well as financial consultants in order to strengthen the internal controls.
- Revise the P forms to reduce the load on reporting systems by eliminating non-specific conditions by medical providers.
- Revise the plan for laboratory strengthening in consultation with states taking into consideration availability of critical human resources like microbiologists as well as clearly mapping each district with a reference lab.
- Strengthen the CSU with additional technical staff and ensure that regular state visits are undertaken at least once a quarter to provide hands on support, resolve operational problems and provide prompt feedback. The states of Andhra Pradesh, Himachal Pradesh and West Bengal should be visited early.
- Undertake a rapid assessment of laboratory equipment supplied to Phase I states to determine the quality and use.
- Effectively use video conferencing to provide technical support and program reviews.
- Develop an action plan for finalizing and implementing Standard Operating Procedures and waste management plans.
- Advise states to procure laboratory consumables/minor lab equipment under NRHM flexible pool and limit project expenditures at district and state levels to contractual staff and operating costs.

Actions to be completed by June 30, 2008

- Establish a mechanism for quality assurance of test kits for outbreak prone diseases including exploring the option of central rate contracts.
- Update the checklists for state visits to include internal controls and review of decentralized procurement.
- Establish network of Infectious Diseases Hospitals (IDH) starting with the focus states with clearly defined inputs to be provided by the IDSP.

Indian Council for Medical Research

Actions to be completed by March 31, 2008

- ③ Inform the state and regional survey agencies regarding the inclusion of blood glucose in the surveys and providing guidance on standardized equipment.
- ③ Promptly organize training in data entry and analysis to state survey agencies.

Action to be completed by June 30, 2008

- Ensure availability of the results for 8 states included in the Phase I of NCD risk factor surveys by April 1, 2008.

States

Actions to be completed by March 31, 2008

- Prepare revised state plans for laboratory strengthening taking into consideration available human resources and inputs received from different disease control programs.
- Improve reporting of clinically confirmed cases by promoting coordination between different players within public sector such as major hospitals, medical colleges, and local self governments.
- Start implementation of urban disease surveillance pilots approved by MOHFW.
- Share consolidated audit reports for FY 2006-07 and strengthen internal controls.

Actions to be completed by June 30, 2008

- Improve reporting from private sector starting with select group of hospitals and popular health providers and establishing simpler mechanisms for gathering information.
- Pilot innovations such as community surveillance.
- Make model laboratories fully functional incorporating Standard Operating Procedures (SOP) and waste management plans

Date for Next Implementation Mission:

13. The next implementation support mission for the project will be held in April 2008.

Annexes:

14. The following annexes are attached
 - (I) Detailed Implementation Progress
 - (II) State Performance Ranking
 - (III) Technical Note on Disease Surveillance: Dr. Claire Broome
 - (IV) Technical Note on Laboratory Strengthening: Dr. Robert Martin
 - (V) Financial Management – Summary from Karnataka

Detailed Implementation Progress

1. **Component 1: Establish and Operate a Central-level Disease Surveillance Unit:** A central disease surveillance unit (CSU) has been established and the full contingent of staff envisaged under the project are in position. The decision taken by the MOHFW to co-locate the CSU with the National Institute of Communicable Diseases (NICD) has helped the IDSP to fully integrate with the national nodal agency mandated with providing oversight for specialized outbreak investigations and the new international public health regulations. More importantly, IDSP is able to draw additional technical support from NICD for outbreak investigations as well as for training.
2. Operational guidelines for disease surveillance for district surveillance units, medical officers and health workers have been prepared and disseminated. Standardized formats for weekly surveillance and outbreak reporting have been prepared and are being used. Based on the implementation experiences, the CSU has initiated a consultative process for revising these forms to obtain more specific disease information and reduce workload of reporting units. A manual on laboratory techniques and health care waste management has been prepared and state laboratory coordinators have been sensitized. The CSU has developed interim software for computerizing weekly surveillance reports and some preliminary analysis. The beta version of web-enabled software recently developed by NIC is currently being tested. Focal points have been identified for each of the focus states for implementation support and trouble shooting. Coordination with other disease control operations notably the National Vector Borne Diseases Control Program (NVBDCP) and National Polio Surveillance Project (NPSP) has improved resulting in rationalization of surveillance forms for malaria and intensive collaboration with a pilot program of intensive collaboration with NPSP in 10 districts.
3. While the above achievements are noteworthy, the CSU now needs to evolve a broader vision on how a well functioning surveillance system can support national policies and strategies for prevention and control of communicable diseases under the National Rural Health Mission (NRHM). Such vision should be embedded with the emerging vision for the NICD as the National Centre for Disease Control. More creative thinking is required for prioritizing information collection so that only relevant information is gathered, analyzed and used effectively to prevent and control outbreaks as well as to understand the impact of ongoing disease control operations. The implementation experiences during the past three years clearly suggest that state ownership and capacities are critical for making IDSP effective. For example, Phase II states of Gujarat and Haryana could make IDSP operational much quicker than many Phase I states. To meet the national and international priorities, reliable disease surveillance information will be required from non-focus states as well. In these states, sentinel surveillance arrangements involving large public and charitable hospitals may be more appropriate till a fully functional IDSP is in position. Rapid urbanization resulting in overcrowding and poor environmental conditions can perpetuate major disease spread as evident from the recent outbreaks of Dengue. The progress in urban disease surveillance pilots has been slow. It is important for the CSU to evolve strategies for urban disease surveillance for different types of urban areas (agglomerations, large corporations, medium and small sized towns) as an integral part of the new Urban Health Mission.
4. A more refined focus is required for outbreak investigation. This requires strong epidemiological capacities at district and state levels with technical support from CSU. Though adequate technical competencies are available at the CSU in this area, with the current staffing it is not possible to provide hands on support on a sustained basis even for the focus states. The strategy of having focal points to states has not been successful as many of these focal points could not visit the states regularly due to their other responsibilities and inability of the CSU to act quickly on observations from the field and provide prompt feedback to states. The functional delineation of responsibilities within the CSU requires some degree of administrative decentralization to respective program officers to ensure adequate and timely response to states and maintain accountability relationship with the Project Director (PD) and National Project Officer (NPO). Despite most states and districts having the data managers in position, due to lack of formal induction, and familiarity

with epidemiologic analysis, they are not optimally fulfilling their roles and responsibilities in IDSP. The financial consultants also require further orientation on procedures to be followed to ensure adequate internal controls.

5. Agreed Actions

(i) To be completed by March 31, 2008: (a) Obtaining required approvals for creating posts of epidemiologists at district and state levels and under the NRHM; (b) Completing the CSU team with additional epidemiologists (8), microbiologists (2) and IT professionals (2); (c) Further rationalizing the P form to limit data reporting to diseases prone for outbreaks and those with specific clinical case definitions; (d) Rapidly mounting an induction program for state level data managers with focus on trend analysis; and financial consultants on IDSP requirements; (e) Issuing office circular clearly delineating functions and operational responsibilities within CSU senior staff with a monthly reporting of progress in agreed work program to the PD and NPO; (f) Signing the MOUs and releasing funds for implementing urban disease surveillance by 4 metros; (g) Identifying a focal point from CSU for intensive collaboration with NPSP in 10 pilot districts.

(ii) To be completed by June 30, 2008: (a) Vision document clearly articulating the place of the IDSP and the proposed NCDC within NRHM as well as the new urban health mission; (b) Strategy for strengthening sentinel disease surveillance in non-focus states and in urban areas.

Component 2: Integrate and Strengthen Disease Surveillance at State and District Levels

6. As envisaged, all Phase I and II states have established State Surveillance Units (SSU) headed by a state technical officer and most of them are sharing weekly surveillance reports with the centre. With the introduction of outbreak reporting by the CSU, reporting of the outbreaks improved during the last three months. District Surveillance Units (DSU) have been established in all 398 districts included in the project from the Phase I and II states. Among the Phase I states 188 out of 210 districts (90%) and 124 out of 189 districts (66%) are reporting data.

7. The biggest challenge continues to be frequent turn-over of the state and district surveillance officers. Even where these officers are available, they tend to have multiple responsibilities and generally do not have public health or epidemiology training (except in states of Tamil Nadu, Maharashtra and Gujarat) which limits their effectiveness in analyzing the surveillance data and taking appropriate action, including quality assurance surveys. So far, the data that is being generated is mainly from the public sector primary health care facilities. The system is yet to capture data from in-patient and out-patient departments of public hospitals, especially district, teaching and infectious disease hospitals which handle a large number of cases. There is also no evidence of monitoring the quality of data and provision of regular feedback to districts is limited. Only 67 districts are reporting some data from the private sector.

8. Surveys for Risk Factors of Non Communicable Diseases. The project aims to support periodic surveys to assess the magnitude and trends in risk factors for Non Communicable Diseases (NCD). An expert committee was constituted to guide the development of the study protocol and tools. There was a delay in finalizing the implementation arrangements and it was finally agreed that the Indian Council of Medical Research (ICMR) will have the overall coordination responsibility for these surveys and the National Institute for Medical Statistics (NIMS) will function as the national nodal agency responsible for standardization of tools including training, data entry and analysis, and for preparing the report. The IDSP has entered into a Memorandum of Understanding (MOU) with the Indian Council of Medical Research (ICMR) on March 19, 2007. For 8 out of 9 Phase I states, a survey agency has been identified in consultation with each state and 5 regional agencies were selected to monitor quality. The ICMR has constituted a National Technical Advisory Committee (NTAC) on May 24, 2007. After holding series of consultations the NTAC has approved the survey protocol and instruments prepared the national nodal agency in July 2007. This was followed by a trainers workshop for state and regional survey agencies. The NTAC has recently reviewed the suggestion from the Bank to include Biochemical parameters in the survey and recommended their inclusion. NIMS is in the final phase of developing an analysis plan and software for data entry and analysis. The surveys are expected to be completed soon and final results are expected by end-March 2008.

9. Recently, MOHFW has taken a policy decision to pilot the proposed national program for NCDs in 6 districts in states of Assam, Kerala, Rajasthan, Punjab, Karnataka and Tamil Nadu. During the mission a meeting was held with the officers from NCD cell of MOHFW, WHO IDSP, ICMR and NIMS. The current sampling protocol for NCD survey provides estimates at state level while the NCD intervention pilot is planned only at district level. It was agreed that IDSP should address the program requirement of baseline assessment of risk factors in the pilot districts after discussions with the NCD cell. This survey will be carried out in 3 states common for both NCD program and IDSP surveys using existing survey agencies after the current round of surveys. In the remaining states NIMS will either provide training and technical support for agencies identified or include the district surveys in the scope of state survey agencies identified. The NIMS will be sharing a proposal with the IDSP for this additional scope of work.

10. Community surveillance. The IDSP envisaged active community participation by identifying diseases appropriate for community based surveillance and encourage communities to report such diseases and actively participate in outbreak investigation and control operations. Unfortunately, there has not been any progress in this area. As agreed in April 2006, it would be appropriate to pilot community participation in disease surveillance in areas where the communities are well organized and mobilized. In Andhra Pradesh, the Bank team had discussions with representatives of Society for Elimination of Rural Poverty (SERP) which is working with a network of self-help groups and the health department. SERP is willing to support a pilot on community based disease surveillance in three districts of Andhra Pradesh (Anantapur, Vizianagaram and Adilabad) representing three geo-economic regions of the state. An initial joint visit by SERP and the health department are planned soon, based on which the outline for the pilot will be finalized.

11. Strengthening data quality, analysis and links to action. This component of IDSP has great potential to transform the infrastructure for disease surveillance and public health response. The National Informatics Centre (NIC) was identified by the MOHFW one year ago to implement the IT component of the project. The intent is to connect approximately 800 sites throughout the country, including CSU, SSU, DSUs, key PH laboratories, and appropriate medical colleges. The broadband connectivity is crucial for: (i) IDSP data entry and data sharing among the district, state and national levels; (ii) in many of these sites it will also support video-conferencing capacity. NIC reports that orders have been placed for computers, printers, scanners, and UPS for 624 sites; 524 have been delivered; 370 are installed. Broadband connectivity is planned via landline (624 ordered; 92 installed) or satellite (400 locations, 207 installed). In addition, availability of IT contract employees is managed by NIC. NIC reports that 379 of 485 data managers have been recruited and are in position. NIC is also tasked with developing (or acquiring) the software needed to support IDSP - including data collection, analysis, display, investigation, and program monitoring. Finally, NIC has awarded a contract for a national call center to receive information about disease outbreaks from health providers.

12. NIC has made real progress in broadband connections, including videoconference between the State Surveillance Units and the Central Surveillance Unit. Videoconferencing has the potential of becoming a routine form of communication for IDSP managers in the states and NICD to discuss program status and seek solutions to problems. However, many districts do not yet have broadband connections operational, so they are limited to using dial up internet and email (or postal service mail) to submit surveillance data. They also cannot participate in videoconferencing for IDSP management or for training sessions. At present, the software available is primarily for data entry; the districts have limited capacity to analyze the data they are collecting, and the data managers are unfamiliar with the types of analyses needed. There is little use of data to track IDSP program performance indicators at the district or state level. Furthermore, a formal process is needed to obtain user (CSU, SSU, DSU) input for software development/acquisition. The proposed call center can be useful as an alternative route to collect information from anywhere in the country, including strategic marketing of the system to the providers and health personnel, links to SSU (and DSU) for promptly evaluating reported outbreaks 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).

13. **Agreed Actions**

To be completed by March 31, 2008: (a) improve reporting by promoting coordination between different players within public sector such as major hospitals, medical colleges, and local self governments; (b) start implementation of community and urban surveillance pilots approved by MOHFW; (c) complete the network to district level in the focus states (both for data transmission and for videoconferencing); (d) modify videoconferencing system so that SSU can communicate easily with all their districts, as well as supporting state to state videoconferences (currently these formats are routed through/controlled by Delhi); (e) support interim data analysis for districts, e.g. by training NIC data managers and/or creating easy to use data display templates so that temporal and geographic trends in collected data can be easily visualized by district surveillance personnel; (f) effectively implement call center; (g) IDSP and the NCD cell will exchange information on each others activities which will be followed by a video conference with state surveys agencies, NCD nodal officers of 6 states; (h) for Phase I states the scope of biochemical parameters will be limited to Glucose estimation while ICMR is undertaking pilots for assessing sensitivity and specificity of new kits for Cholesterol; and (i) NIMS will develop a sampling plan for district level estimates and share a proposal for undertaking these surveys with IDSP.

Actions to be completed by June 30, 2008: (a) completion of the network to district level in the Phase II states (both for data transmission and for videoconferencing); (b) plan from NIC for ongoing staffing, performance, security, and maintenance of network and videoconferencing; (c) IDSP should develop a strategic plan to use data to monitor program performance; and (d) initialize the reports of first round of NCD surveys and organize dissemination workshops in coordination with NCD cell of MOHFW.

Component 3: Improve Laboratory Support

14. The IDSP envisaged upgrading of laboratories to provide rapid and reliable confirmation of suspected cases, monitoring drug resistance and monitoring changes in disease agents and introduction of laboratory quality assurance systems. A five level laboratory network is planned under IDSP which included: Peripheral Laboratories and Microscopic Centers (L1 labs); District Public Health Laboratories (L2 Labs); Disease Specific State Laboratory (L3 Labs); Regional Laboratories (L4 Labs) and National Reference Laboratories (L5 Labs). After a protracted delay, baseline survey of laboratories in Phase I (by a consultant agency) and Phase II states (by project states) has been completed. The key finding is that most of districts do not have microbiologists and some of them do not even have a qualified doctor or technician to operate a lab. Even in places where staff is available, there has been no training and bio-medical waste management practices are not being followed.

15. On quality assurance, the NICD has prepared an External Quality Assurance Scheme (EQAS) with a panel consisting of 3 slides and bacterial isolate and shared with L3 labs of 12 focus states during a one day orientation held for lab coordinators. These laboratories were to analyze this panel as per their routine protocols and share the results with NICD. The results have just started flowing back. Most states do not have dedicated public health laboratories and public health services are provided by multiple laboratories and usually the clinical lab attached to the district hospital is proposed for strengthening under IDSP. Though few states (Karnataka, Maharashtra and Gujarat) have dedicated public health labs, the services of these labs are mostly limited for undertaking water analysis. IDSP proposed to strengthen 49 districts labs identified in consultation with states as model labs and organized a one day orientation for state lab coordinators recently. Lab Manual and Bio-safety manual have been finalized, printed and disseminated. A 5 week epi-lab training course was created and 12 districts included in the 49 districts identified for PH lab strengthening were trained.

16. The most critical challenge for IDSP is to identify appropriate range of accurate tests that can be done at different levels of laboratories. The baseline survey as well as state visits and IDSP initial experiences suggest significant human resource shortages making it difficult for the district public health laboratories to function as envisaged under the project. Therefore, any laboratory support should first consider the human resources available in each state and should evolve its own plan based on the feasibility. Furthermore, rapid tests (antigen or antibody) may be the test format most feasible for use at district laboratories. However, this requires attention at the national level by

identifying what tests should be provided; developing performance specifications for such test kits, and a process for ongoing kit quality control. There will also need to be a plan in collaboration with district hospitals for how such kits would be used (e.g. only for outbreak investigations, only for inpatients, etc.). There is also need to improve coordination of laboratory services offered by different national programs to optimize efficiency and quality of the existing laboratory network. All these actions require appropriate vision and strong leadership at the CSU. While the CSU has such capabilities, due to multiple responsibilities these officers are not able to provide required attention for IDSP and state lab focal points will be required for continuous consultation and management with the states.

17. Agreed Actions

Actions to be completed by March 31, 2007: (a) The IDSP nodal officer will revise the plan for laboratory strengthening based on the findings of baseline surveys and implementation experiences so far. Such a plan, in addition to scope, will include, training, establishment of quality systems for serological kits, etc.; (b) IDSP team to have two consultants for laboratory services, who along with the two new staff appointed at NICD, will liaise with states by undertaking monthly visits and provide hands on support to laboratory strengthening; and (c) all Phase I states to have full time laboratory coordinator in place and prepare state-specific action plans for laboratory strengthening.

Component 4: Training for Disease Surveillance and Action

18. The initial training envisaged for district surveillance teams as well as public health staff (one worker per sub centre and one doctor per primary health centre) has been more or less completed by many focus states. However, the project design did not include training of hospital staff who are important for passive surveillance. While states like Tamil Nadu and Gujarat have promptly rectified this anomaly by training doctors and staff from hospitals, this remains an issue in the other states. The training division of IDSP needs to be commended for its effort to pilot a 2-week field epidemiology training. It is now important to develop institutional mechanisms by training master trainers to roll out this training in focus states. It was agreed that by March 31, 2008 the training plan will be updated including the 2 week field epidemiology training as well as training for doctors and medical records staff working in major hospitals.

Financial Management

19. The budget and funds flow for the project has been satisfactory with the budget for the year 2007-08 being Rs 800 million which includes a provision of Rs 148.6 million for the Avian Influenza (Human Component), although no expenditure has been incurred under this component till date. The project has taken steps to improve the financial management by submitting pending claims for the last nine months and preparing grant monitoring ledgers for the states. With the expenditure levels expected to pick up in the next one year, certain important actions will need to be taken to bring the overall financial management arrangements of the project to a satisfactory and acceptable level. These include (i) submission of audit report of CSU and all the states for the financial year 2006-07 along with consolidated statement of audited expenditure and summary of audit observations, (ii) reconciliation of audited expenditure with the expenditure reported in the FMR and in the SOE claims submitted, (iii) improving monitoring systems for flow of financial information from the districts to the SSUs to CSU to facilitate submission of complete Financial Monitoring Reports (FMRs) in a timely manner, and (iv) providing financial management training-cum-orientation to all the states surveillance officers and financial consultants based on internal control weaknesses observed during the visit to the state IDSP office in Karnataka.

20. Agreed actions: By January 31, 2008 the CSU will share consolidated audit report that includes both CSU and SSUs reconciled with FMRs submitted along with state-wise audit observations. By March 31, 2008 the CSU will arrange training on FM for state surveillance officers and as well as financial consultants.

Procurement

21. The Project became effective in October 2004 and actual procurement commenced in year 2005-06. For Phase-I (9 states) procurement was done centrally for all laboratory/office equipment by the Hospital Services Consultancy Corporation (HSCC). However from July 2006, the procurement of laboratory equipment such as autoclave, hot air oven, water bath and office equipment like photocopier, fax machine, etc. has been decentralized. The deliveries under all the contracts issued by HSCC (totaling to Rs.28.66 Million) have already been completed to the states, while some of the installations are still in progress. The mission requested MOHFW to expedite the completion of the installation without any further delays.

22. Substantial delays occurred during the Phase I procurement due to which MOHFW decided to take up the procurement for Phase II and Phase III of residual IDSP through Empowered Procurement Wing (EPW) of the MOHFW for contracts exceeding Rs.5 million in value, while remaining procurement is to be handled by CSU in NICD. The estimated value of the central procurement for Phase II and Phase III states is likely to be Rs.160 million, while the value of decentralized procurement by states is likely to be Rs.60 million. The procurement under Avian Influenza – Human Health component, would cost another Rs.125 million and will be handled centrally. Few items (such as office equipment, UPS, Generators, Inverters, stabilizers, autoclave, hot air ovens, etc.), which are covered by existing DGS&D rate contracts, would be purchased by states. The mission was informed that EPW has already invited bids for lab equipment for 2007-08 and the bid evaluation is underway. However, in view of the implementation experiences in Phase I states and revisions being made in the plan for laboratory strengthening, this bidding process may require cancellation.

23. During the mission, Bank shared the findings of the post review of the contracts issued during the year 2005-06 with MOHFW. The collection of contract data from most of states was a major issue, because of which the Bank's consultant could not cover the contracts issued by the states in the post review. To address this, MOHFW may urgently request the states to share the data about the contracts issued by them on quarterly basis. The general compliance of agreed procurement procedure and quality of documentation are other areas of concerns. During the state visits, the Bank team has observed some indications of possible fraud and corruption.

24. In view of the risks involved in decentralized procurement, MOHFW was requested to ensure the regular monitoring of decentralized procurement and capacity building of the staff handling the decentralized procurement at state/district/lab levels. This would perhaps also need additional procurement manpower at CSU. Other contracting options such as use of central/state level framework agreements (rate contracts in format acceptable to the Bank) may also be explored to enable the districts/labs to use these in lieu of shopping. MOHFW may also consider providing procurement review checklists to the chartered accountants auditing the state societies. A sample checklist was handed over to NICD during the last mission. MOHFW may also compile the procurement related remarks/observations from state audit reports, and forward these to the Bank along with the observations on financial audit. As most of the procurement being undertaken at district level is very small in value, MOHFW proposed to do away with the district level procurement from the next financial year so that supervision efforts could be focused on remaining larger value procurement. To ensure the quality of diagnostic kits being procured at state levels, MOHFW may shortlist the suppliers whose products meet minimum quality standards and the states may invite quotations from such shortlisted suppliers for procurement of diagnostic kits under Shopping.

25. The contracts proposed for developing computerized surveillance system were also discussed during the mission – a matter pending for quite some time. During the last mission, it was clarified by the Bank that NIC and ISRO being part of the Government of India will not be acceptable as service providers but as implementing agencies. Bank further clarified that if the justifications for direct contracting/single sourcing are acceptable to the Bank and the service providers (NICS and Antariksh Corporation) are otherwise eligible and willing to enter into a contract with MOHFW in the format acceptable to the Bank, these two contracts could be financed from the credit. The Bank shared the model contract document to be used for these procurements with MOHFW and it was agreed that MOHFW shall submit the proposal for this component to the Bank latest by December 5, 2007.

Environment

26. The mission found that the implementation of this component remains slow and some of the key activities are still incomplete. The mission feels that the CSU has not provided sufficient guidance to the states for the implementation of this component. It is reiterated that activities are still not being undertaken in a structured manner, defined by an Action Plan, as was recommended in the last mission in May 2007. The mission rates this component as Moderately Satisfactory.

27. The Standard Operating Procedures (SOP), which are very critical for efficient operations of labs, have not yet been developed. While the Bio-Safety Manual was completed and distributed to all labs, there has been no effort in further dissemination to labs at district levels and no monitoring mechanism set up to ensure its usage. Within the 3-week EpiLab training course conducted in August, 2007, there was a one day session on Biosafety and Healthcare Waste Management issues. The mission notes that there has been no systematic guidance to the states for undertaking ongoing training of this component at the state level. Additionally there is no systematic format for monitoring and evaluation by the CSU or by the states. No facility-specific Waste Management Plans for Laboratories have been developed.

28. The Bank consultant undertook a field review in L1, L2 and L3 laboratories in Mizoram and Gujarat. Implementation of this component is varied in the states, one of the reasons being the lack of structured guidance from CSU. In Gujarat, it was found that training of different categories of employees has been conducted regularly and copies of the Biosafety manual were distributed to district and other laboratories. This was not the situation in Mizoram. Likewise, biosafety practices, IEC and waste management practices were found to be better in Gujarat laboratories.

29. Agreed actions: The mission recommends the following action plan for next three months: (a) development of an action plan for finalizing and implementing Standard Operating Procedures (SOP) and waste management plans including training and M&E arrangements; and (b) finalize the SOPs and waste management plans and organize a national workshop to disseminate to state laboratory coordinators for decentralized training.

STATE PERFORMANCE RANKING

States	Outcome reporting		Weekly reporting				Critical Staffing					Total 50
	Number of outbreaks reported during the last quarter (July -Sept 07)	Number of outbreaks confirmed and documented	Primary health facilities	Hospitals	Private sector	Data analysis & feedback	SSO	State Lab coordinator	State & Dist. SO training	Medical Officer's training	Para-medical staff	
	> 10 =6; 5-10:4; <5=0	> 100% = 6; 50- 100%:4; <1-50%=1	> 90% =5; 60- 90%:3; <1- 60%=1	> 75% =5; 50- 75%:3; <1- 50%=1	>50% = 5; 25- 50%:3; < 25%=1	State & Districts giving feedback =4, Only state giving feedback to districts= 3 only some districts giving feedback =2	Full time SSO >1 year= 5; Full time SSO 6 months - 1 year= 3 yrs; Full time SSO < 6 months =1	Full time SLC >1 year= 5; Full time SLC 6 months - 1 year= 3 yrs; Full time SLC < 6 months= 1	> 75%=1, <75=0	> 80% of all=4, < 80% of all =3, >80% of PIP= 2; 60-80 Of PIPT=1 <60% PIP=0	> 80% of all=4, < 80% of all =3, >80% of PIP= 2; 60-80 Of PIPT=1 <60% PIP=0	
Major States												
Tamil Nadu	6	6	5	3	3	3	3	5	1	4	4	44
Gujarat	6	6	5	3	3	3	5	0	1	3	3	38
Karnataka	4	4	5	3	3	3	3	5	1	2	2	35
Maharashtra	4	4	1	2	2	3	5	5	1	2	1	30
Haryana	4	4	5	3	3	3	5	0	1	2	2	32
Orissa	6	6	3	0	0	2	3	0	1	2	2	25
West Bengal	4	4	1	0	0	3	5	0	1	2	1	22
Rajasthan	4	4	3	1	1	3	1	0	1	2	2	22
Kerala	NA	NA	3	3	3	3	1	0	0	2	2	17
Andhra Pradesh	NA	NA	3	3	1	2	1	0	1	2	2	15
Smaller States & UTs												
Goa	0	0	5	5	5	3	5	0	1	4	4	32
Uttarakhand	4	4	5	3	3	3	5	0	1	2	1	31
Himachal Pradesh	3	3	2	2	0	0	1	0	1	2	2	16
North Eastern States												
Mizoram	3	6	5	3	5	3	5	NA	1	2	2	34
Nagaland	3	6	1	2	NA	3	6	NA	1	2	2	26
Maximum Score	6	6	5	5	5	4	5	5	1	4	4	50

Technical Note on Disease Surveillance and Epidemiology

by

Claire Broome, MD, World Bank Consultant

Background

India has long experienced one of the highest burdens of infectious diseases in the world, fueled by factors including a large population, high poverty levels, poor sanitation, and problems with access to health care and preventive services. It has traditionally been difficult to monitor disease burden and trends in India because of the high disease burden and poor surveillance infrastructure. It has been even more difficult to detect, diagnose, and control outbreaks until they had become quite large.

In an effort to improve the surveillance and response infrastructure in the country, in 2004 the Integrated Disease Surveillance Project (IDSP) was initiated with funding from the World Bank. This project seeks to improve (1) reporting of a series of reportable diseases and syndromes, (2) laboratory capacity to diagnose these priority diseases, (3) recording and transmission of the information, and (4) the ability to detect outbreaks, and promptly investigate and control them. This national program is to accomplish these goals by working with the states to improve the completeness, reliability, and timeliness of information collected at the peripheral levels of the health care system, engage the large private health care sector in disease reporting, conduct training of surveillance personnel, equip and staff public health laboratories, build information technology infrastructure for data transmission and analysis, and improve capacity of rapid response teams.

Given the surveillance challenges in India, the project seeks to accomplish its goals through relatively easy to implement activities. These include having a small list of priority conditions, many of which are syndrome-based and easily recognizable at the lowest levels of the health care system, a simplified battery of laboratory tests, and reporting of largely aggregate data rather than individual case reporting. However, the project also includes activities that are relatively high technology, such as computerization, electronic data transmission, and video conferencing links for communication and training.

The project was planned to be implemented all over the country covering different states of India in a phased manner during the first three years. However, there was a slow take off even among the phase I states known to have good capacities, and it was agreed that the project would focus on a limited number of states to demonstrate the operational feasibility of integrated disease surveillance especially in terms of strengthening local analysis and action, including promotion of private sector participation in disease surveillance. Since November 2006, 14 focus states have been identified for intensive follow-up to demonstrate successful implementation of IDSP.

Mid-Term Review**Process**

The mid-term review team reviewed relevant documents, including recent project reviews by World Bank Consultants, and the US Centers for Disease Control; participated in meetings at the CSU in Delhi; visited three states, including facilities at the state, district, PHC, and sub-center (detailed itinerary appended); participated in a meeting at the CSU with focus state IDSP leaders; attended a meeting on the status of the non-communicable disease survey, and discussed epidemiology training programs with the WHO staff and with the Public Health Foundation of India.

Component I. Establish and Operate a Central-level Disease Surveillance Unit

Under this component, MOHFW will establish a disease surveillance unit at the central level. The new unit will support and complement the states' disease surveillance efforts. The activities of the unit will include: (a) preparation of national guidelines for disease surveillance based on agreement with the states and other stakeholders on the priority diseases and conditions to be included in the surveillance system, standardized case definitions and the methods to be used for their surveillance; (b) promoting compliance by the states with central policies and technical guidelines; (c) providing overall support to states and coordinating national surveillance activities, including the preparation of a national plan of action; and (d) data analysis to identify epidemiological trends and preparation of national reports on the epidemiological situation

Observations

- The Central Surveillance Unit was originally created in the MOHFW, and is now in the National Institute for Communicable Disease; there are now staff for whom IDSP is their full time responsibility. Additional positions have been approved for 7 epidemiologists, 2 microbiologists, and 2 IT professionals.
- Conditions under surveillance and case definitions are detailed in the Medical Officers Manual issued by the GOI in May 2005. This manual also encourages revisiting the list of conditions under surveillance every two years. A proposed revision of the "S form" for reporting syndromic data from Sub Centers and the "P form" for reporting probable cases from clinical facilities is under consideration.
- The IDSP and the Indian Council of Medical Research (ICMR) signed a formal Memorandum of Understanding (MOU) on March 19, 2007 for implementing NCD risk factor surveys and data collection is in progress in several states; state level data will be provided as a report to the states. The technical advisory group has recommended collection of blood glucose measurements as part of the surveys.
- There has been significant improvement in surveillance reporting by the districts (from 43% in November 2006 to over 90% within two weeks by October 2007) in the focus states. Fifty-nine per cent of the districts share data with the Central Surveillance Unit within one week of reporting period, and 69 districts (27%) are now able to capture some data from private providers. However, enrollment of private sector hospitals continues to be a challenge. In the Phase II states, 65% of districts are reporting to the CSU.
- CSU is now receiving routine reports on outbreaks occurring from focus states. There appears to be a major improvement in recognition, reporting and response to outbreaks (see list of conditions investigated below under state section).
- An officer from the Central Surveillance Unit has been designated as a focal point for each of the focus states to provide technical support and help resolve implementation bottlenecks. A weekly videoconference has recently been initiated between this officer and the state to discuss outbreaks and resolve issues.
- These regular conferences were acknowledged by both CSU and SSU in Maharashtra and Karnataka to be valuable for resolving problems and enhancing communication. Occasionally personnel available for the video conference at the state were noted to be too junior/wrong capacity (e.g. data manager) to be effective participants.
- CSU is initiating an urban surveillance plan focused on hospitals, urban health centers and private sector with support from state governments and medical education department. This initiative is planned to address the current paucity of surveillance data from urban areas, as the IDSP system to date is strongest in the rural areas where government health system is stronger.
- CSU is also planning a sentinel ID hospital network at 8 areas around the country.
- NIC reported that the contract for the **call center** has been awarded and is expected to become operational in December 2007. The center will focus on reports from providers and health personnel. An important discussion occurred regarding a) the routing of information about

outbreaks received at the call center b) whether the call center should be integrated with civil emergency response (ambulance, police) and c) how information about the call center should be communicated to clinicians and reporting units.

Component II. Integrate and strengthen disease surveillance at the state and district levels

This included 4 sub-components—state, district, community levels and data analysis/IT:

(a) **Sub Component -State-level Activities:** A disease surveillance unit will be established at the state level under the project. The State Surveillance Unit (SSU) will be headed by a technical officer from the state cadre. The state office will also hire 3 technical consultants and 4 support staff. Emphasis will be on strengthening integration of the activities of existing health staff, laboratory information, the private sector and the community into the overall system through implementation of procedures and activities spelt out in the district-level and state-level disease surveillance manuals. Activities at the state level will include: (a) preparing and sending monthly summaries of the disease situation to the central level; (b) training state and district level staff; (c) implementing periodic surveys for non-communicable diseases and/or their risk factors; (d) integration of disease control efforts based on the surveillance data; (e) supporting districts in data analysis, transport of laboratory specimens, and outbreak investigations; and (f) analyzing surveillance data across districts.

(b) **Sub Component - District level Activities:** The District Surveillance Unit (DSU), established under the project, will be headed by a medical graduate with a background in public health and/or epidemiology. Other contract staff will include a microbiologist and 4 support staff, including data entry operators. Activities will include: (a) analyzing surveillance data from the peripheral level; (b) providing support for collection and transport of specimens to laboratory networks; (c) initiating investigation of suspected cases; (d) providing feedback to the health facility; (e) responding promptly to information provided by communities.

(c) **Sub Component- Community level Activities:** Activities will include: (a) notifying the nearest health facility of a disease or health condition selected for community-based surveillance; (b) supporting health workers during case or outbreak investigations; (c) using feedback from health workers to take action, including health education and coordination of community participation.

Observations

- All focal states provided reports on **outbreaks identified and investigated**. Many of these were gastroenteritis, assumed to be water borne. In addition, hepatitis, leptospirosis, cholera, typhoid, dengue, chikungunya, AES, malaria, kalazar epidemic fever, mass hysteria, scrub typhus, response to avian influenza, measles, and anthrax were investigated by the states.
- The DSU at Pune provided information on source of outbreak reporting—7 were reported by medical officers, 1 was detected from media reports, and three were notified by villages.
- Urban Health Center in Mumbai described following up on a case of measles by visiting households in the same community to search for additional cases.
- All focus states provided updates on IDSP activities—information on reporting by districts is summarized above under CSU. In general, reporting from PHC and SC is improved; government and private hospitals continue to present challenges. Several states reported that they are still planning to conduct workshops with private sector colleagues.
- Uttarakhand (at state level) and Maharashtra (state and district levels) have full time epidemiologists involved with their IDSP activities.
- Uttarakhand has encouraged medical officers to include written diagnosis in their OPD records by making this a criteria for performance evaluation
- The epidemiologist positioned at Uttarakhand SSU is providing weekly feedback to districts
- ANM in Kolar SC had participated in IDSP training and demonstrated excellent understanding of her responsibilities for disease reporting and outbreak reporting to the relevant PHC. She did not have a mobile phone, and said she would travel 5 km to PHC when report is necessary.

- Kolar District in Karnataka, data from the hospital OPD has not been reported to the DSU. An option discussed was to provide services by the DSU data entry clerk to the District Hospital to tally and record the data.

Recommendations for improving disease surveillance at district, state and community levels

I. Outbreak detection and 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 SC reporting units should be explored.
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.
3. In some states, it will also be important to improve coordination between IDSP and epidemiology cells/response units.
4. 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** (eg expedited access to reference diagnostic tests, information about clinical presentation of rare conditions, access to limited therapy—eg 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). I recommend a system specific to public health, but if the system is part of a civil response system, it will be critical to evaluate whether it is meeting the needs of outbreak detection.
5. **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 (I recommend further revision of P form, e.g. dropping fever, ARI/ILI, ADD/Acute Gastroenteritis (leaving cholera) -- the categories I recommend dropping are non-specific and high volume, so they create a large burden of data collection on the system, but the data are difficult if not impossible to interpret.

4. To better define the appropriate diagnostic tests to include for IDSP surveillance of severe pediatric Acute Gastro Enteritis (AGE) and fever, an **operational surveillance research** approach would be valuable—an area with excellent laboratory and epidemiologic capacity could design studies of agents responsible for AGE and fever in hospitalized children using improved laboratory diagnostics in collaboration with a district hospital. For AGE, this could include culture for cholera, salmonella and shigella, as well as rotavirus rapid tests. For fever/sepsis/meningitis, it would be critical to include blood culture, as well as latex antigen testing (Hib, pneumococcal, meningococcal) for CSF. It would also be crucial to include testing for presence of antibiotic activity in urine, to facilitate interpretation of culture results. These studies could be particularly important as India considers utilization of expensive new vaccines to prevent *Haemophilus influenzae* b, pneumococcus, and rotavirus; an effective surveillance system should help measure impact of use of such vaccines.

III. Accelerate laboratory diagnosis of cases²

1. **Strengthen reporting of laboratory confirmed data** using L form. The L form asks for a line listing of cases with positive lab tests, which should be useful. I suggest adding a column for type of specimen—a CSF or blood culture result is quite different from sputum, eg. Also, I understand the need to focus on a limited number of tests, but IDSP should consider collecting reports of positive tests for Hib, rotavirus, pneumococcus, and other salmonella species.
2. 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. Convergence with national disease control programs

1. Encourage IDSP to better engage with National Disease Control Programs in harmonizing surveillance data collection, support for laboratory services (e.g. PHC lab techs should perform microscopy for both TB and malaria; efficient provision of rapid diagnostic kits for dengue); efficient development and utilization of reference laboratories (as IDSP seeks to identify and strengthen state and key district labs, one could consider harmonizing efforts with NVBDCP sentinel dengue labs; sentinel Avian influenza labs, NPSP reference labs, etc); and prevention and control activities.
2. IDSP should collaborate actively with NPSP on the proposed pilot of joint surveillance in 10 districts.

(d) **Sub Component: Strengthen data quality, analysis and links to action:** Activities will include: (a) 'real-time' on-line entry, management and analysis of surveillance data through use of computers, the Internet and the WWW; (b) reporting surveillance data using standard software, including GIs, while allowing flexibility to add new systems as needed; email services between central sections and departments, within and between states, laboratories and other persons and institutions involved in public health; (c) rapid dissemination of 'health alerts' and

² see report from Dr. Robert Martin (Annex III) for details on laboratory observations and recommendations. Particularly important for improving surveillance will be appropriate wider utilization of validated rapid tests for IDSP conditions.

other textual information; and electronic distribution of reports both to the public health staff and civil society;

The Information Technology aspects of the project will involve setting up a network to transfer data between various levels of the system, provision of stand alone computers at the district level and links to district, state and national units. Software for the system will be developed to facilitate simplified data entry with multilingual formats, analysis and consolidation of data at each level, generation of alerts on the basis of disease-specific thresholds, documentation of the system and development of manuals, phased deployment of software, skills assessment of staff and provision of appropriate training.

Observations

- This component of IDSP has great potential to transform the infrastructure for disease surveillance and public health response and should receive substantial attention. After some delay, the National Informatics Centre (NIC) has been identified by the MOHFW for implementing the IT component of the project. The intent is to connect approximately 800 sites throughout the country, including CSU, SSU, DSU's, key PH laboratories, appropriate medical colleges—an enormous task.
- In addition, availability of IT contract employees is managed by NIC. NIC reports that 379 of 485 data managers have been recruited and are in position.
- I note that IDSP staff at all levels used the term “IT” broadly—I suggest categorizing IT into three functional areas to assure clarity in communication, defining tasks and measuring progress.
 - 1) **broadband internet connectivity (and computer infra-structure)** for use of generic internet functions—email, WWW, (and email file transfer of disease reports in those districts where direct web entry of case reports into IDSP software is not yet feasible)
 - 2) **videoconferencing** via satellite or broadband
 - 3) **data entry and analysis software** acquisition or development and use
 - 4) **call centre establishment and use**
- The broadband **connectivity** aspect of the network is crucial for IDSP data entry and sharing among the district, state and national levels. NIC reports that orders have been placed for computers, printers, scanners, and UPS for 624 sites; 524 have been delivered; 370 are installed. Broadband connectivity is planned via landline (624 ordered; 92 installed) or satellite (173 locations-? Number installed)
- All DSU and SSU visited had computers present and installed. However, availability and utilization of broadband was highly variable. In Tehri Garhwal District, Uttarakhand for example, dial up connection was the only option (and did not appear to be functioning at the time of our visit), even though DSU is located adjacent to an NIC site.
- We observed state videoconference facilities linked to the CSU in Maharashtra and Karnataka SSUs.
- NIC is tasked with developing (or acquiring) the software needed to support IDSP—presumably including data collection, analysis, display, investigation, and program monitoring.
- Although the need for software is clearly identified in IDSP documents, I did not see documentation of a process involving IDSP and end users (ie DSU's) for determining the functionality software should have; obtaining user input during development/acquisition; user acceptability testing at beta stage, and a systematic ongoing change management process, all of which are necessary stages for the highly complex task of software development/acquisition/utilization. Software can be key to IDSP success, supporting functions such as:
 1. easy to use data display templates so that temporal and geographic trends in collected data can be easily visualized by district surveillance personnel, ideally flagging disease rates above expected
 2. analytic capacity to support more experienced epidemiologists
 3. use of data to track IDSP program performance indicators
 4. robust support for data entry, “cleaning”, and management

- At present, the districts we visited had **limited capacity to analyze the data** they are collecting. Software available is primarily for data entry. Although several districts had exported data into MS Excel, the worksheets included data for all conditions for a single week, and the data managers were not able to display data for a specific condition over time—a fundamental analysis to readily visualize increasing trends, or a sudden spike in cases.
- I saw graphs showing increasing numbers of districts reporting over time from several states. Beyond that, there appeared to be limited use of analyses to monitor IDSP program performance at the state and district level.
- Several states expressed interest in access to population denominators to enable analysis by rate, rather than just by number of cases; there was disagreement regarding how these data should be made available (i.e. acquired by NIC, by SSU, or by CSU). Although some expressed the opinion that these should come from official census figures, one PHC in Bangalore was generating their own denominators from household surveys.
- **Call center** contract has been awarded and is expected to become operational in December 2007. During the initial phase focus will be on reports from providers and health personnel. An important discussion occurred regarding a) the routing of information about outbreaks received at the call center b) whether the call center should be integrated with civil emergency response (ambulance, police) and c) how information about the call center should be communicated to clinicians and reporting units

Recommendations for strengthening of data quality, analysis and links to action

1. **Rapid completion of the network (both for data transmission and for videoconferencing)** 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. It allows public health officials in different locations to share information, display data, and develop plans of action in the midst of an outbreak. It is becoming a routine form of communication for IDSP managers in the states and NICD to discuss program status and seek solutions to problems. Once the system is operational at districts, there will be even greater opportunities for frequent communication without difficult travel.
2. The system should also facilitate **SSU communication with all their districts, as well as state to state videoconferences** (currently these latter formats are routed through/controlled by Delhi)
3. It will be crucial that the necessary staff and infra-structure are available at sites so that this relatively complex technology is well used; the involvement of the NIC in assuring **ongoing staffing, performance, security, and maintenance** is important.
4. Information from calls should be routed simultaneously, not sequentially, to relevant DSU (for follow-up) and to SSU and CSU (for information and to recognize cross-state outbreaks).

IDSP Software Needs

1. An interim option for data visualization capacity at the DSU. It is axiomatic that those responsible for collecting data should be able to benefit from their efforts. It should be possible to create export routines and Excel templates that would provide interim support.
3. I recommend active participation by IDSP personnel at national, state, and district level with NIC in defining software needs and evaluating options for development vs acquisition.
4. For projects with substantial software development, I recommend that IDSP identify appropriate person(s) to actively monitor NIC products throughout the development life cycle—ie use cases, software project plans, as well as early versions of actual software.
5. IDSP should also enhance use of data to monitor program performance. A resource demonstrating extensive and creative **use of data for program monitoring** is the data system for the National Polio Surveillance Program. I recommend participation from NPSP as well as IDSP when considering design of appropriate performance monitoring systems for IDSP.

Summary of Key Recommendations

1. Continue to strengthen IDSP capacity for early outbreak detection

- by emphasizing **urgent outbreak reporting** to districts (by mobile telephone if feasible) from reporting units
 - i. **outbreak reporting to IDSP has substantially improved** since June 2007 mission; many focal states are identifying and reporting outbreaks. Further attention is needed on quality of outbreak investigation.
 - ii. **continued collection of S form data from sub-centres** 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..
 - iii. However, **other reporting units** (PHC's, hospitals, private hospitals, medical colleges) should report **more specific case definitions (revised P form, dropping fever and Acute Gastroenteritis, accelerate laboratory diagnosis of cases, and report laboratory confirmed data**
 - by analysis of routinely collected data
 - i. district surveillance officers should analyze weekly data before submitting to SSU
 - ii. **improved data management and analytic templates** are urgently needed to facilitate visualization of data
 - by implementing the 24/7 call center for health personnel
 - i. information from calls should be routed simultaneously, not sequentially, to relevant DSU (for follow-up) and SSU and CSU (for information and to recognize cross-state outbreaks)
 - by implementing systematic media scanning
 - i. States should be encouraged to pilot approaches for local media scanning

2. Accelerate recruitment and data collection from sentinel reporting units

- By targeting large and strategically located hospitals for special attention as reporting units such as Medical College, private hospitals, and Infectious Disease Hospitals
- By targeting large and strategically located laboratories for special attention and strengthening, including accelerated distribution of validated IDSP rapid reagents
- By ensuring that some of these sentinel units are in states with less developed IDSP programs.

3. Rapidly implement, and utilize the Videoconferencing/broadband hybrid satellite network for IDSP

4. Strengthen IDSP analytic capacity and use of data to document public health program impact

- There is an urgent need for an interim option for data visualization capacity at the DSU.

- Active participation by IDSP personnel at national, state, and district level with National Informatics Center in defining software needs and evaluating options for development vs acquisition
- Accelerate IDSP epidemiologic technical expertise, utilizing expertise of WHO Field Epidemiology Training Program and potential collaboration with the Public Health Foundation, India.
- Implement and publicize effective epidemiologic investigations through monthly videoconferences and reports in national and state bulletins

5. Encourage IDSP to better engage with National Disease Control Programs in harmonizing surveillance data collection, laboratory, and prevention and control activities

Conclusion

IDSP is an important project for improving surveillance for key diseases in India, particularly focused on improving early detection of outbreaks. Substantial progress has been made in recruiting and training staff, creating guidance and manuals, but the challenge of changing “culture”-- the long-standing experience of data collection not linked to action -- is enormous. The challenge is multiplied by the size of the population and the different capacities in different states.

The current “Focus state” strategy is an excellent approach to achieve successes, as well as to assess implementation strategies as the project proceeds. In the past six months, the states have identified and investigated a substantial number of outbreaks. For maximum impact of the Focus State approach, it will be important to document and communicate “successes” effectively.

At the same time, one can strategically strengthen surveillance activities at key sites throughout the country, as well as providing a Call Center and media scanning capacity to complement the surveillance infra-structure. This provides some capacity nationwide, while building the more in depth surveillance, laboratory, investigation, and action capability.

**Technical Note on Laboratory Strengthening
by Dr. Robert Martin, Centers for Disease Control**

Summary

1. The Indian government's Integrated Disease Surveillance Project (IDSP) with World Bank support has been ongoing since 2004. During the past three years, attempts to address laboratory capacity have focused on provision of equipment and materials and, more recently, some training activities. However, advances in assuring laboratory capacity to detect/confirm and monitor disease outbreaks have not progressed as planned. At this point, it is important to take a step back from very specific activities (e.g., purchase of equipment, etc.) and put a significant effort into revising the original plan by paying attention to shortage of qualified human resources for public health laboratory services and quality assurance systems that are necessary to support a national disease surveillance system.
2. At the national level, there is a need for evolving a clear vision for the laboratory system and ensure adequate authority for National Institute of Communicable Diseases (NICD) and IDSP to develop the system working collaboratively with other key players, notably the Indian Council of Medical Research (ICMR) and National Polio Surveillance Project (NPSP). While it is often intuitive that a strong laboratory system is necessary in all countries, the very concrete steps to be taken are often elusive in most countries. As a result, the same systemic bottlenecks are likely to recur with every outbreak that reaches national attention. Development of a national vision and approach for "*essential public health laboratory services*" therefore will provide the ability to respond with confirmation of disease outbreaks, monitor ongoing outbreaks/health problems, and measure the effectiveness of implemented health interventions.
3. Under the IDSP, the Indian Government has an opportunity to create a national system of laboratories that can be developed through district and state laboratories that in turn link to national level. While the needs of each district and state may vary marginally, there will be still more similarities among them than differences. At the national level, a national laboratory coordinator supported by competent staff is required for providing local and state support. The responsibilities of this team can include providing technical support, technology transfer, cooperative development of standards, on-site reviews, assistance in developing personnel standards, assistance in equipment maintenance, development of standards for records (both accessioning and retention), standards for transportation of specimens, development of external quality assurance programs (proficiency testing), assistance in acquiring and/or development of control materials and other activities that are essential to laboratory system that supports disease detection, control and prevention.
4. In the October 2007, a CDC team provided recommendations regarding the plans for upgrading laboratory infrastructure. While those recommendations remain valid, it is important to note that we recognized the variation among states in terms of capability and capacity. For example, Maharashtra, Tamil Nadu, Uttarakhand, and Karnataka are all capable of development of capacity, but the way in which the public health laboratory strengthening will be carried out in each state will vary.

Key Findings

5. Variation across States: As would be expected in a country of great diversity, there is also great diversity of capability and capacity to implement IDSP. States like Maharashtra and Karnataka have capability and have already embarked on building laboratory capacity for IDSP. However, it is clear that there is much work to be done throughout India. In states where capability for surveillance exists, there is a need to address quality of data collection and a need to further develop analytic skills. 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.
6. Leadership for evolving public health laboratory services: There is an urgent need for a strong leadership at the national level to evolve approach appropriate for India to assure high quality laboratory services. There is also a need to address issues of coordination of laboratory testing.

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. The approach that will be required in order to provide an easily shared vision is to identify specific needs (e.g., culture of cholera) and then back into how to develop a quality service.

7. Range of tests by district labs: Most district laboratories currently provide chemistry and hematology services. Hematology is most often provided using manual methods, but some facilities have automated equipment. Semi-automated or fully automated equipment is being used for chemistry services. While many district labs are performing serological tests for Chinkungunya, Dengue and Typhoid, generally culture and sensitivity testing is limited at district level.

8. Fragmented laboratory services: There is a great opportunity and need to strengthen laboratory capacity in India under the auspices of the IDSP. Currently, laboratory capacity in India for diagnosis of infectious diseases is fragmented with some capacity at the National Institutes of Communicable Diseases, at the India Council for Medical Research and at Medical Colleges around the country. However, these appear to be independent efforts rather than a coherent approach to assure broad availability of services to public health. 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 kits purchased within the country.

Challenges

9. The challenges to developing the described requirements of a national system of laboratories are many. However, these are challenges that face every country and there is significant technical assistance available to overcome these challenges.

- How to evolve a cohesive public health laboratory system for India that links every district to a reference lab with ability to confirm diagnosis of diseases included under IDSP?
- How can NICD/IDSP provide leadership for the effort to strengthen public health laboratory services in India?
- How to ensure quality of laboratory services?
- Will one strategy work for India or each state needs to evolve its own plan based on its capacities and needs?
- How to support development and implementation of plans for systematically building central state and district level capacities for public health laboratory services?

10. In addition to the challenges mentioned above, another significant challenge that must be addressed is related to the personnel. Development of a national system of laboratories will require personnel that possess leadership and management skills at a level beyond the bench scientist but below the administrators. A level of expertise and leadership is required that enables advocacy at the appropriate levels within the laboratory environment, whether that be at the national level or at the state or district level. The leadership of the laboratory must be able to interact with peers (e.g., medical staff) in order to assure proper choice, utilization, and interpretation of laboratory testing.

Recommendations

- The organization chosen to provide national leadership for strengthening of the laboratory services must immediately address the following three issues. First, there must be a system which allows availability of quality test kits at district and state laboratories. While the district/state may pay for the test kits from their own budgets, a national approach is necessary to assure quality of test kits purchased from either other countries or from within India. Second, there must be a national training program to build capacities for performing testing and obtaining high quality results. For some tests, it would be possible to provide that training via the satellite videoconferencing system that has been developed. Third, there must be a process established by which an appropriate quality assurance program can be implemented. These three activities must be addressed at the national level and cannot be

left up to individual states/districts. Without national leadership there is no national system of laboratories.

- The NICD should evolve a national plan (with technical assistance from appropriate resources) that will support state needs. For example:
 - Providing the leadership in quality systems training and developing an office with responsibility for quality assurance. This office will be responsible for interacting with state coordinating microbiologists, and at times, responsible for consultations at the district level upon request of the coordinating microbiologist.
 - Training (beyond initial IDSP orientation) starting with national workshops (possible via satellite videoconferencing) providing a broad concept of the importance of practices that lead to a test result that is accurate (i.e., quality systems development).
 - Evolving a process for providing appropriate training for each test that will be used in the IDSP. For example, implementation of appropriate rapid serological testing.
- Given the size and diversity of India, it is unreasonable to implement a plan that would address all districts and states. Rather, some **pilot states** should be chosen where there is reasonable expectation of success in order that the experiences and successes can be applied in other districts and states. In each pilot state, the diseases for which confirmation is required will have to be determined and a one year plan for implementation be evolved. Training for state coordinating microbiologist will take place at NICD to assure a consistent approach.
- 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. This requires national leadership and regular interaction/follow up with the states. Probably around 8 state laboratories may be upgraded and the experiences of Tambaram suggest that each site may require up to \$500,000 depending on their current status.
- As noted above, states will differ with respect to capability and capacity. In Karnataka, where 12 specialists with MSc medical microbiology qualification have been hired and a state coordinating microbiologist has been identified, it is possible to establish a **pilot model** that might work for states at a similar level. For example, while all district laboratories will benefit from equipment that has been provided and will also benefit from the addition of a microbiologist to their staff, it would be prudent to think about the levels of service in this environment.

A framework for laboratory development and key responsibilities of coordinating state microbiologist are presented below:

Framework for Laboratory Development in IDSP

Laboratory level	Laboratory capacity	Laboratory Objective	Needed Actions	Issues for further attention
L 1: Peripheral laboratories and microscopy centers	Diagnosis of malaria, and TB; Chlorination levels in water and fecal contamination of water	Diagnosis of malaria and TB, Chlorination levels in water	Training of contractual lab technicians recruited under different programs in diagnosis of both malaria and TB	How to improve quality assurance at L1 labs? How to ensure better coordination of available supervisory resources?
L 2: District Public Health Labs	Diagnosis of malaria, TB, Typhoid, and Cholera; and water quality	Diagnosis of malaria and TB, Availability of confirmatory tests for Typhoid and Cholera to confirm outbreaks and for specific clinical situations	Develop a specimen transportation policy: appropriate medium, transportation, reference labs etc. Strengthen serological diagnosis and establish: (a) standard list of tests to be done based on IDSP disease list specific to the states and (b) systems for national quality assurance of test kits such as specifications, process for batch control and national rate contract; (c) avoiding duplication lab resources (sentinel labs) and the supply of kits for example Dengue kits by NVBDCP	How to address the special and emerging needs such as anti-biotic resistance? How IDSP can establish a system of undertaking high quality operational research studies eg to identify common causes of severe pediatric fever and gastroenteritis cases admitted in hospitals?
L 3: Disease based state laboratories	Confirmation of union and state specific diseases; Support of outbreak investigations	Confirmatory testing depending state situation.	Developing a realistic action plan for laboratory strengthening clearly defining which laboratories will be providing microbiological culture. Positioning a state laboratory coordinator with clear TOR.	
L4: Reference and Quality	Support of outbreak investigation		Identifying reference laboratory capacity	

control laboratories			for: (a) exotic diseases notified by IDSP and (b) evaluation/validation of diagnostic kits	
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Responsibilities of Coordinating State Microbiologist

- Participate in the development and implementation of the state IDSP plans focusing on establishing confirmatory testing procedures for outbreak prone diseases.
- Work with NCID in development of training programs.
- Identify gaps that may prevent implementation of appropriate quality assurance.
- Determine how oversight and follow up will be addressed within the state.
- Develop specimen transportation system(s) relevant for the state.
- Work with NICD in development of appropriate SOP's for all laboratories in the system (e.g., malaria, TB, serological assays).
- Develop and implement a schedule for regular field visits to all laboratories in the state.
- Participate in the training programs for IDSP as well as specific technical training related to isolation and identification of appropriate agents.
- Participate in development of appropriate epidemiologic applied research relevant for the state.
- Interact with the medical staff at the local level to determine which microbiological services may be appropriate to implement.
- Interface with state and district epidemiologists and data managers participating in regularly scheduled meetings.

Financial Management – Karnataka

Finance Staffing

The project has adequate staff capacity to handle the financial management issues in the state. At the state office, the project has recruited a financial manager (M.Com, M.Phil) who is supported by an accounts superintendent from the state government. All 25 districts have finance staff (called district accountants) in position. The financial manager at the state office is technically qualified and capable to handle the financial management of the project at the state level, but would need more guidance from the CSU on the project requirements.

Budgeting and Funds Flow

The state project office, referred as PD(IDS) has now institutionalized an efficient system of preparing the Annual Action Plan by collecting necessary inputs from the districts and request for funds from CSU. There had been surplus/idle funds with the PD(IDS) in the past about two years as the project received substantial amount of funds in 2004-05 and 2005-06 (Rs 2.92 crores and Rs 1.1 crores respectively). While this was more than double the requirement of that time, it prompted the state project office to initiate a more systematic way of preparing Annual Action Plan effective 2007-08; and request for necessary funds accordingly.

Accounting, Record Keeping and Internal Controls

The project maintains manual Books of Account. The booking keeping and internal controls at the state level need to be strengthened further and the issues identified during the mission that need to be addressed immediately are as follows.

- ③ It could not be checked if the PD(IDS) has maintained any supporting documentation (spreadsheet etc) for consolidating the FMRs from the districts and expenditure incurred by PD(IDS), which would be the basis for submitting the consolidated FMR to the CSU. This supporting documentation (in the form of print outs) is however available for the operational funds provided by the state government for IDSP. Reportedly, the information pertaining to the Bank provided funds was available in a computer that had been infected by virus and therefore the information was lost.
- ③ At PD(IDS) level, a separate general ledger record for each district in terms of opening balances, funds sent to each district during the quarter/year (for lab consumables etc), expenditure reported and closing balance is not maintained, which should be the basis to track balance of advances with the districts and keep a control on them. It was agreed that this would now be prepared and the balance of funds with each district as on September 30, 2007 reported in the FMRs sent by them will be reconciled with the respective balances of districts in the PD(IDS)'s books. This will help establishing internal controls at the PD(IDS) office on the advances pending with the districts at any given point of time.
- ③ The bills/invoices that have been paid and are enclosed with the payment vouchers are not defaced with the 'PAID' stamp, voucher reference and date; thereby carrying the risk of duplicate payments using the same bills again at a later date. It has been agreed to implement this with immediate effect.
- ③ It is appreciated that the bank reconciliation statement is prepared on monthly basis. This should however be duly approved by the Project Director and kept in record. It was agreed that this system will be put in place with immediate effect.
- ③ Physical verification of assets has not been done since the inception of the project. It was agreed that the physical verification of the assets will henceforth be done on yearly basis and the results will be documented.

External Audit

The external audit for 2006-07 for the IDSP project at the state level has been completed and the report has been sent to CSU. There are however significant weaknesses pertaining to the quality of audit in the state, which are stated below and would need to be addressed in consultation with state NRHM. It is understood that the auditor for all disease control programmes in the state will be finalized by state NRHM from 2007-08.

- The appointment of the auditor at the state as well as district levels has been made without reference to the TOR and the guidelines provided in the financial manual of the project. As a result of that it can not be ascertained if the auditor has audited the accounts as per the scope provided in the financial manual.
 - a) At the PD(IDS), the auditor has not provided a management letter, which is required as per the financial manual of the project, and
 - b) The financial statements have been prepared and audited at some districts by the auditor without providing any audit report.
- The process of appointment of the auditor is not clear. Also, the fees of Rs 5,000 paid to the auditor at the PD (IDS) is prima facie too low for a quality job to be done.

Integration with NRHM

Integration with NRHM at the state level is effective to the extent that all financial reports sent by the PD(IDS) to CSU are copied to State NRHM office. No meeting with NRHM finance staff could however be organized as it was reported that the only finance staff (a Chartered Accountant) at the State NRHM office has resigned and is in the process of leaving.

