Integrated Disease Surveillance Project (IDSP) in Gujarat: An Evaluation with particular reference to Malaria

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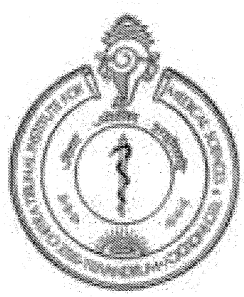
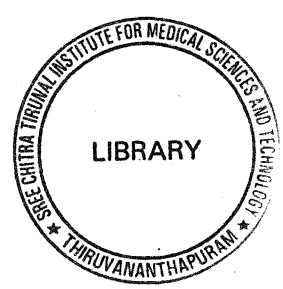
Dissertation submitted in partial fulfillment of the requirement for the award of the degree of Master of Public Health.





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Amar N. Shah

Declaration

I hereby declare that this dissertation work titled "*Integrated Disease Surveillance Project (IDSP) in Gujarat: An Evaluation with particular reference to Malaria*", is an original work of mine and it has not been submitted to any other institution or University.

Dr. Amar Shah
Thiruvananthapuram
27 October 2007.

Certificate

I hereby certify that the work embodied in this dissertation titled '**Integrated Disease Surveillance Project (IDSP) in Gujarat: An Evaluation with particular reference to Malaria**' is a bonafide record of original research work undertaken by Dr AMAR SHAH, in partial fulfillment of the requirement for the award of the MPH degree, under my guidance and supervision.

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List of abbreviations

AFRO	WHO Regional Office for Africa
AMCHSS	Achutha Menon Centre For Health Science Studies
BHO	Block Health Office(r)
CDC	Centre for Disease Control
CDHO	Chief District Health Office(r)
CHC	Community Health Center
CSU	Central Surveillance Unit
DALYs	Disability Adjusted Life Years
DPHL	District Public Health Laboratory
DSO	District Surveillance Officer
DSU	District Surveillance Unit
FHW	Female Health Worker
GIS	Geographic Information System
GSWAN	Gujarat State Wide Area Network
IDSP	Integrated Disease Surveillance Project
IDSR	Integrated Disease Surveillance and Response
MHW	Male Health Worker
NICD	National Institute for Communicable Disease
NRHM	National Rural Health Mission
NSPCD	National Surveillance Project for Communicable Diseases
NVBDCP	National Vector Born Disease Control Program
PHC	Primary health Centre
RNTCP	Revised National Tuberculosis Control Program
RRT	Rapid Response Team
RU	Reporting Units
SEARO	WHO Regional Office for South East Asia
SSU	State Surveillance Unit
WHO	World Health Organization

Abstract

Background and Objectives: Government of Gujarat started the Integrated Disease Surveillance Program from 2003, and this program was merged with India's Integrated Disease Surveillance Project (IDSP) from November 2005. Its aim is to assist health staff to detect and respond to diseases of public health importance. By the year 2007, all the Indian states have started implementing the IDSP. So far no major study has been conducted in any Indian state regarding functioning of IDSP. Therefore I decided to conduct an evaluation study to find out merits and demerits of the project with specific focus on malaria

Methods: All the 25 districts in the state were grouped into two based on the median slide Falciparum rate. One district from each group was selected randomly. From each district 17 health facilities including four sub centres, eight primary health centres, two community health centres, one chief district health office and two block health offices were selected for the study. Data were collected using semi structured questionnaire for health staff, observatory check list for health facility, in-depth interviews for selected health staff and record reviews. Positive patients were visited at their homes for cross checking the validity information.

Results: In general there was a well established infrastructure for surveillance system in all districts which provided electronic data reporting on a weekly basis. Surveillance data showed a definite increase in the case and outbreak detection and decrease in deaths, which indicates favorable outcome for IDSP. The parallel pre-existing disease control programs also helps in managing the disease situation. Laboratory confirmation of disease (checked for Malaria) was consistently found at every level. Compliance of the system particularly timeliness & completeness of the reported data was good (89% and 98% respectively) at the rural reporting units. The routine weekly analysis of data at state and district level was found to be consistent and of the desirable standards. Specifically assigned Rapid Response Teams along with allocation of funds up to taluka level ensured the epidemic preparedness of 92% in studied districts. Attitude & satisfaction of health staff regarding IDSP was found to be 94%, which is a good sign for the future development of the project.

On a negative note, involvement of Private sector was very limited (3%) and the strategies of involving them were not shown in both districts. The written case management protocol for epidemic situation was not found at any health facility studied. Use of Geographic Information System is not based on epidemiological data. The data operators were not provided training regarding data management at state and district level. Reporting systems were weak in terms of data documentation and the data were not recorded in a standard way in 55% of health facilities visited.

1. INTRODUCTION

1.1 Introduction to disease surveillance

Disease surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential to the planning implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know.[1]

1.2 Why we need surveillance?

There is a significant magnitude of communicable disease.

Worldwide, one death in every three (32.3%) is from (communicable diseases, maternal-perinatal conditions, and nutritional deficiencies).[2]

There is a high rise in non-communicable diseases.

The proportion of deaths due to non-communicable disease is projected to rise from 59 per cent in 2002 to 69 percent in 2030.[3]

India has also rising burden of chronic diseases, which are estimated to account for 53% of all deaths and 44% of DALYs lost in year 2005.[4]

Epidemics cost lives and money.

Besides direct costs in outbreak control measures and treatment of a patient, the indirect costs due to negative impact on tourism and trade is also devastating. For example, the failure to detect and control the epidemic of plague in 1994 at its early stages resulted in tragic loss of life as well as disruption of trade, commerce, transportation and tourism - estimates of the total cost are as high as US$ 1.5 billion; and the emergency and large scale response eventually required placed a heavy burden on the health system.[5]

Indirectly these are costs to not having an effective disease surveillance system.

Importance of malaria surveillance

At the end of 2004, 107 countries and territories had areas involving 3.2 billion people at risk of malaria transmission.[6]

A global total of 402 million cases were estimated for 2004, of which about 57% was from AFRO and 30% from SEARO.[7]

For India the estimate was 83 million cases for year 2004.[7] but if we see reported cases of malaria for India it was 1.78 million cases. The reason is inadequate health information system. Completeness of reporting of data is just 2.5%. [8]

1.3 What type of surveillance we need?

India is currently passing through an epidemiological transition. Many states in India have good health delivery systems while other states are lagging far behind.

Health problems of some states are predominantly due to communicable diseases while in others it is due to non communicable diseases.

Need for comprehensive surveillance

A study in Tamilnadu state clearly showed that India needs a surveillance system, which is integrated, decentralized and involving private and government sector.[9]

Logic of having surveillance

It is believed that disease surveillance program will avert a sufficient number of disease outbreaks, reduce human suffering, morbidity and mortality in specific diseases by improving disease control programs so that the incremental cost of running the project can be financed from the savings of actual health expenditure in the state.[10]

1.4 Literature related to surveillance evaluation

1.4.1 International

The primary evaluation of integrated disease surveillance and response (IDSR) in Tanzania was one of the first approaches to evaluate such type of system.[11]

- The instruments used in evaluating the system were record review, group interview and self-administered survey.
- 33 indicators were used in the four broad group namely reporting, use of surveillance data, outbreak management and management of IDSR system.
- Within each district, the selection of health facilities was made on a convenience basis with an effort to make the sample as representative as possible in terms of facility location, size, performance, and ownership (government/private), taking into consideration time and transport constraints.

In September and October 2004, WHO teams evaluated the project on strengthening surveillance and control of vaccine-preventable and epidemic-prone diseases, which had been implemented in four countries in the WHO African Region (Burkina Faso, Ghana, Guinea and Mali) and in one country in the WHO Eastern Mediterranean Region (Sudan) in 2001.[12]

The final project evaluation's main objectives were:

- To measure the achievements of the project objectives, outputs and outcomes based on the expected results;
- To assess the changes in each country's surveillance system using the core indicators of Integrated Disease Surveillance and Response (IDSR) that measure the effectiveness of the system and thus serve as proxy measures of project outcomes;

The evaluation process employed a qualitative approach, but it also drew on available quantitative information. In order to reduce costs, the information-gathering process was organized in two phases: a "distance phase" of retrospectively reviewing available country specific project documents and a "field phase" to gather information not captured through document reviews by interviewing key informants involved in implementation. The field phase also served to confirm and expand on what had been learnt from other sources.

In February 2000, ministry of health, Makerere University Institute of Public Health, WHO, and CDC performed a cross-sectional survey to determine the performance and support of infectious disease surveillance systems at health facilities (e.g., dispensaries, health centers, and hospitals) and district health offices.[13] The six systems assessed were the Health Management Information System, the Weekly Epidemiological Report, Tuberculosis/Leprosy, HIV/AIDS, Polio/Acute Flaccid Paralysis, and Guinea Worm Eradication.

The assessment covered 52 (3%) of 1639 health facilities and eight (18%) of the 45 district health offices (two in each of the four geographic zones of Uganda). The districts were selected by UMoH on the basis of timeliness of reporting. Three or four health facilities were selected randomly within each district. Performance was measured using surveillance indicators (i.e., detection, registration, and confirmation of case-patients; reporting; data analysis and use; and epidemic preparedness and response) and infrastructural and managerial support (i.e., feedback, performance reviews, training, and resources) of surveillance activities using a protocol developed by WHO-AFRO with support from CDC.

A study on timeliness of reporting of four notifiable diseases in 8 states of the USA showed that delay in reporting varied markedly by type of disease and it is territory. The method for data collection was review of records.[14]

A modified version of the WHO draft protocol for assessing surveillance and response systems was seen in one of the assessment performed by the WHO member in assessment of the national communicable disease surveillance and response system, Ethiopia.[15] It had assessed the core and support functions of IDSR system. The health facilities were selected with a mix of random and convenient sampling.

1.4.2 National

Tamilnadu NADHI (North Arcot District health Information) model outlined various reasons for successful surveillance, which includes simplicity, low budget, private sector participation, regular feedback of information through a monthly bulletin.[9] This study also pointed out that though data on malaria and HIV infection were available at national level, no one has used the data at the district level before.

A study by Sathyanarayana for "Evaluating Integrated Diseases Surveillance Project in Bellary Unit, Karnataka state" used a record review and interview schedule tool for data collection. This evaluation concentrated on the parameters like timeliness, trained manpower, use of surveillance data and protocol adherence. [16]

1.4.3 State

A situation analysis for IDSP Navasari District, Gujarat revealed that the surveillance for risk factors for non-communicable disease has not been started yet and the participation from the private practitioner is minimal.[17, 18]

1.5 Rationale for the study

- IDSP is currently in the implementation stage in all the Indian states and till date no major study has been conducted in any Indian state regarding functioning of IDSP.

- So it is of public health importance to evaluate the performance of the IDSP so that merits and demerits of the project can be examined and appropriate public health strategies can be planned for future development of the project. As one of the objectives of the IDSP is "To integrate existing surveillance activities so as to avoid duplication and facilitate sharing of information across all disease control programs and other stake holders it is very important to evaluate the surveillance adequacy by IDSP so that decision regarding merging it with existing vertical disease surveillance system can be taken up correctly.

- Gujarat State has been selected for this evaluation based on feasibility

2. BACKGROUND OF THE GUJARAT STATE

2.1 Geography

Gujarat is situated between 20°1' and 24°7' north latitudes and 68°4' and 74°4'east longitudes on the west coast of India. It is bounded on the west by the Arabian Sea, on the north-west by Pakistan, on the north by Rajasthan, on the east by Madhya Pradesh and on the south and south-east by Maharashtra.

2.2 Demography & Socio-economic factors

In Gujarat there are 25 districts, 226 Talukas, 242 towns & 18618 villages.

Its official and primary language is Gujarati. The population density is 258 per square km.[19] The religion of the majority of its residents is Hinduism, in addition to significant percentages following Islam, Jainism, Zoroastrianism and Christianity. Most of the Gujarati people are vegetarians. Amongst Hindus the deity of Krishna is famously worshipped in His form of Sri Nathji throughout Gujarat. Gujarat is the birthplace of Ghandhiji.

Table 1: Demographic, Socio-economic profile of Gujarat State as compared to India[19]

S. No.	Item	Gujarat	India
1	Total population (in million)	50.67	1028.61
2	Decadal Growth (%)	22.66	21.54
3	Population below Poverty line (%)	14.07	26.10
4	Schedule Caste population percentages	7.09%	16.2%
5	Schedule Tribe population percentages	14.76%	8.2%
6	Female Literacy Rate (%)	58.6	54.28

2.3 Health systems

2.3.1 Health services infrastructure

As per the norm the number of subcentres is adequate, however, there is a shortage in Primary Health Centre (PHC) and in Community Health Centre (CHC) of 100 and 20 respectively.[20]

The other Health Institutions in the State comprise of 13 medical colleges, 25 district hospitals and 409 referral hospitals. Also there are 106 city family welfare centers and 8347 rural dispensaries. Apart from this there are 48 Ayurvedic hospitals and 493 dispensaries, 14 homeopathic hospitals & 216 dispensaries and no Unani hospitals.

2.3.2 Human resources for health:-

Against the total required multipurpose worker (Female)/ ANM at sub centers & PHCs, 77.9% are in position, whereas for health Worker (Male) /MPW (M) at Sub centers only 38.12% positions are filled. For the Health Assistant (female)/ LHV post at PHCs, 80.4% and Health Assistant (Male) 57.5% are in position. Among the Radiographer, Pharmacist, Lab technician and Nurse/midwife, 40%, 59.3%, 64.3% and 53% are in position respectively. While 84.6% of PHC doctor positions are filled, only 7.7% of specialists are in position at CHCs.

2.3.3 Health status

Table2: selected indicators

	Selected Indicators	Gujarat	India
1	Crude Birth Rate [21]	23.7	23.8
2	Crude Death Rate [21]	7.1	7.6
3	Total Fertility Rate [22]	2.42	2.7
4	Infant Mortality Rate [22]	50	57
5	Maternal Mortality Ratio [23]	389	466
6	Sex Ratio [19]	921	927

2.3.4 The burden of diseases

Malaria is one of the major public health problems in Gujarat and it accounts for 6.06 percent of total India's burden. [24]

2.3.5 Review of existing surveillance systems

Disease surveillance activity in Gujarat

The NSPCD (National Surveillance Project for communicable Diseases) was initiated in 1998 as a pilot project with WHO supporting the initial 5 districts. The reporting was on monthly basis.[25]

Following earthquake in Gujarat (2001), WHO was involved in relief and rehabilitation activity.[25] As a part of this package, WHO developed the weekly disease surveillance programs in Kutch district. By 2003 Integrated Disease Surveillance Program being implemented in 8 districts and 3 municipal corporations of the state. By July 2004 the program was expanded to all the 25 districts of the state. In June 2005 WHO handed over

the program to Government of Gujarat and was merged with National level project IDSP on 8-11-2005. Now Government of India is giving technical and financial assistance and for these activities Rs. 18 Crores have been sanctioned for the period of year 2005-2009. Diseases like Malaria, Leprosy, HIV/AIDS, Blindness control, tuberculosis, Polio have their own surveillance activity in their respective disease control programs.

2.3.6 Brief description of existing component of surveillance system

OVERVIEW OF IDSP

In the country the IDSP was implemented in three phases in three years and in Gujarat it was implemented in Phase II (2005-06)

Objectives of IDSP [10]

- To establish a decentralized state based system of surveillance for communicable and non-communicable diseases so that timely and effective public health actions can be initiated in response to health challenges in the country at the state and national level.
- To integrate existing surveillance activities so as to avoid duplication and facilitate sharing of information across all disease control programs and other stake holders

Specific Objectives[10]

1. To integrate and decentralize surveillance activities
2. To establish systems for data collection, reporting, analysis and feedback using information technology
3. To improve laboratory support for disease surveillance
4. To develop human resources for disease surveillance and action
5. To involve all stakeholders including private sector and communities in surveillance.

2.3.6.1. ***Priority diseases***[10]

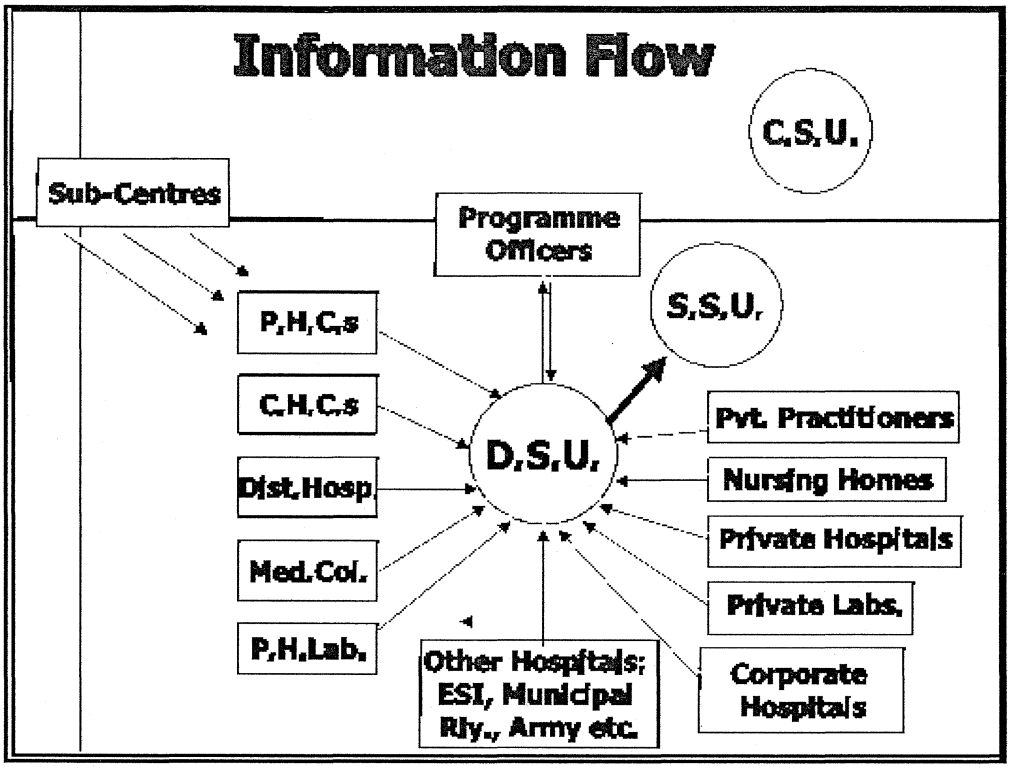
Table3: List of priority diseases in Gujarat

Regular Surveillance	
Vector Borne Disease	1. Malaria
Water Borne Disease: (Cholera)	2. Acute Diarrhoeal Disease 3. Typhoid 4. Hepatitis
Respiratory Diseases	5. Tuberculosis 6. Acute Respiratory Infection
Vaccine Preventable Diseases:	7. Measles
Diseases under eradication	8. Polio
Other Conditions	9. Road Traffic Accidents (Linkup with police computers)
Other International commitments	10. Plague, Yellow fever
Unusual clinical syndromes: (Causing death/hospitalization)	11.Menigoencephalitis/ Respiratory Distress, Hemorrhagic fever Undiagnosed conditions
Sentinel Surveillance	
Sexually transmitted diseases/Blood borne	12. HIV, HBV, HCV
Other Conditions	13. Water Quality 14. Outdoor Air Quality (Large Urban centers)
Regular periodic surveys	
NCD Risk Factors	15 Anthropometry, Physical activity, blood pressure, tobacco & diet
State specific diseases	
Gujarat State specific diseases	Dengue, Leptospirosis, diphtheria, Hepatitis A & E

The number of core diseases is limited to improve quality of surveillance and to reduce workload on the peripheral health worker.

Process, Structure & linkages

Flow Chart 1: Information flow under IDSP



SOURCE: GOI, Integrated Disease Surveillance Project India: Project Implementation Plan 2004-2009

Output

Surveillance Action in IDSP

Preset trigger levels for diseases will be identified and specific responses prescribed for various levels. The levels will depend on the epidemic potential, case fatality of the disease and the prevalence of the problem in the community.

1. Trigger Level-1 Suspected /limited outbreak – Local response

2. Trigger Level-2 Epidemic – Local & Regional Response

3. Trigger Level -3 Widespread Epidemic – Local, Regional and state level responses

Communication

To ensure quick data flow and accessibility of data to all stakeholders at the district, corporation, medical college and hospital, RDD and the State levels, special software for IDSP has been designed. This software (Web based application software) will be available to the offices of the CDHO/MOH/MC/RDD/and the State through the Gujarat State Wide Area Network (GSWAN).

3. OBJECTIVES OF ASSESSMENT

- To assess the overall structure and support function of the Integrated Disease Surveillance Project in Gujarat State.
- To assess core functions and surveillance quality with particular reference to Malaria surveillance component of the Integrated Disease Surveillance Project (IDSP).

4. METHODOLOGY

4.1 *Preparation for the assessment*

- Review of literature regarding disease surveillance studies in India and abroad.
- Situation analysis in December 2006 in one district of Gujarat to determine which aspect of the Disease surveillance needs to be evaluated.
- Indicators: - Framework for components of surveillance systems targeted for evaluation is given in the following table. [26, 27]

Table 4: Framework for components of surveillance system

Core functions	Support functions	Surveillance quality	Surveillance structure
Case detection	Standards & guidelines	Completeness	Strategy
Case registration	Training	Timeliness	Stakeholders
Case confirmation	Supervision	Usefulness	Networking & partnerships
Reporting	Communication facilities	Acceptability	
Epidemic preparedness	Resources	Simplicity	
Response & feedback			

Indicators adopted and modified from guideline given by WHO.[27]

- Exclusion criteria: indicators, which were optional, not context specific and repetitive in nature were excluded from the list and a few context specific indicators were added.

Proposed list of Indicators for evaluation please refer ANNEX 1

4.2.1 Selection of districts

Districts were arranged in ascending order according to average Slide Falciparum Rate (2001-2006) and then divided into two groups by taking median SFR as the dividing point. One district was selected randomly from each group. (ANNEX 2)

4.2.2 Selection of health facilities

Within each district 16-18 health facilities were selected based on multi stage selection as shown in the flow chart.

Flow Chart 2: selection of health facilities

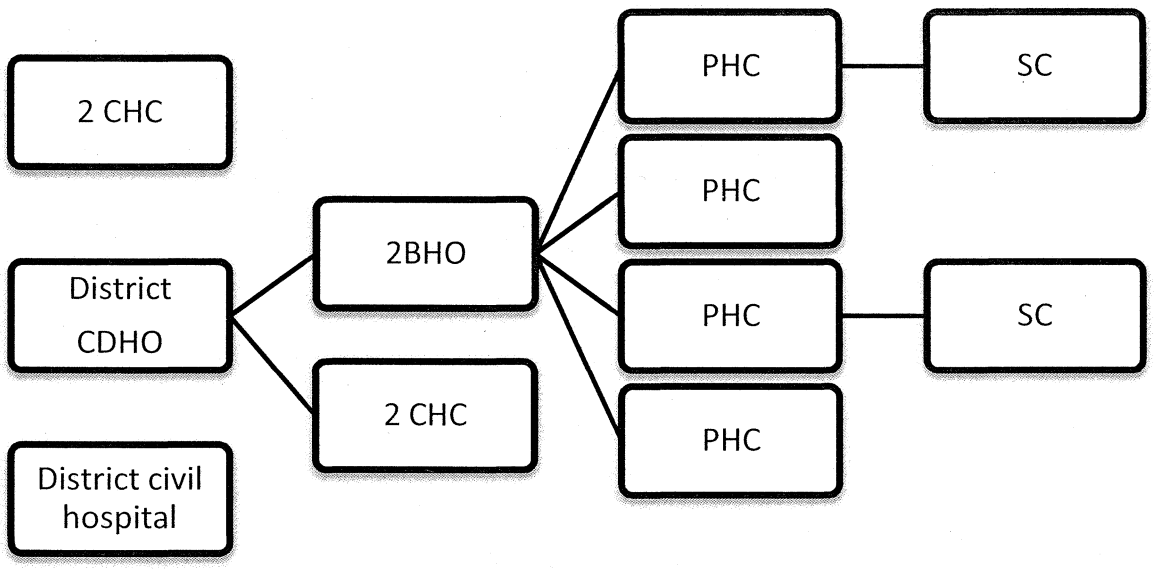


Table 5: Total health facilities visited: 35

Health Facility	Number
Sub Centre	8
PHC	16
CHC	4
BHO Office	4
CDHO Office	2
IDSP state office	1
Total	**35**

Table 6: Total interviewed person: 53

Type	Number	Proportion
Health Worker	8	15%
Medical Officer	20	38%
Lab Technician	16	30%
Health Officer (BHO, DSO, CDHO)	8	15%
Project officer	1	2%
Total	**53**	**100%**

4.3Procedure and data collection tools

4.3.1. Procedure

- Written permission was taken from Gujarat Govt. for the study.
- Ethical clearance for the study was given by the Sree Chitra Tirunal Institute for medical sciences and technology, Trivandrum.
- All participants were thoroughly explained about the purpose of the study and voluntary nature of the participation. Participants were also assured for anonymity of their identity. Prior to interview written informed consent from all participants was taken.

4.3.2. Assessment tool

4.3.1.1 Semi structured questionnaire and observation check list guideline were used for data collection among sampled health facility and health professionals. (ANNEX 3) A modified version of the WHO draft protocol for assessing surveillance and response systems was used.[28, 29] An assessment tool comprising of five sets of questionnaires was developed for use at the health facility (for health worker, lab technician, medical officer), intermediate level (DSO, BHO, CDHO) and state level (project officer). Questions were reviewed, modified, and adapted to suit the local realities.

4.3.1.2 WHO modified questionnaire was used for In-depth interviews of Key informants (from sub sample of semi structured questionnaire health professionals five in numbers.[12] It included the various types of health care providers (MPHW, medical officer, district surveillance officer chief district health officer, IDSP state nodal officer). (ANNEX 4)

4.3.1.3 Review of reports (ANNEX 5)

1. Quarterly review reports by State IDSP Cell
2. Weekly IDSP alerts– from District and State IDSP Cell.
3. Reports on malaria by NVBDCP
4. IDSP project documents
5. Village wise Focal spray report
6. Outbreak reports from State Epidemic Cell.
7. District: Outbreak reports, results of data analysis, epidemic preparedness plans, meeting minutes, schedules and reports for health education and other activities, and District Health Action Plan.

4.4 Field assessment

Data collection time: - 15th June to 15th September

4.5 Data analysis

4.5.1 Quantitative analysis

Data from the record review and semi structured questionnaire were entered into Microsoft excel spreadsheet and analyzed with SPSS version 14.0.

Action taken based on data: - By NVBDCP protocol, for malaria control 'regular spraying' should be followed in endemic areas, but in non endemic areas 'focal spraying' should follow the reported malaria cases. Therefore to check the action taken on the basis of reported data, the dates of the focal spray with IDSP reported malaria cases were tallied. This was done by reviewing the records for a period of one month (July 2007) in both the districts. The action was considered to be appropriate if the focal spray followed within one week of malaria case reporting.

4.5.2 Qualitative analysis

Qualitative data were collected by recording the five interviews. Later on transcripts were prepared from it and analyzed based on each component assessed. They were used to complement the quantitative data.

Accuracy of the reports

Accuracy of the reports was cross checked by paying home visits to the diagnosed malaria cases. For this purpose eleven health facilities were selected randomly. The recorded malaria cases diagnosed in the last two weeks were cross checked for accuracy of the report.

5 FINDINGS

5.1. Presence of Surveillance Systems

The surveillance system was present in all the 25 districts of Gujarat since July 2004 and it was merged with IDSP in November 2005. The Integrated Disease Surveillance System targets 17 selected diseases. Immediate and weekly reporting were expected for tuberculosis, cholera, plague, yellow fever, meningococcal meningitis, measles, acute flaccid paralysis/polio, neonatal tetanus, malaria, typhoid fever while AIDS, leprosy, and sexually transmitted diseases were reported on sentinel surveillance. State specific diseases include dengue, Hepatitis A & E, Diphtheria, Leptospirosis & unusual syndrome. This disease surveillance system was functioning in all offices and health facilities sampled (N=35).

Although tuberculosis and malaria are part of the IDSP, there were vertical data collection for these diseases coordinated by the Revised National Tuberculosis Control Program and NVBDCP in all health facilities sampled (N= 35).

Priority of diseases: - During discussions with key respondents the inclusion of TB into weekly surveillance system could not be justified. Instead a monthly reporting system would be more meaningful to capture the trend of TB (static, increasing or decreasing).

5.2. Case detection and confirmation

5.2.1. Use of standard case definition

5.2.1.1 Standard case definition availability: -

All facilities (n=28) implementing malaria surveillance had standard case definitions. At district level and the PHC level the 'IDSP medical officer manual' was available. All the eight health workers had the reference manual in Gujarati language.

5.2.1.2 Standard case definition knowledge: -

All the 20 medical officers interviewed satisfactorily answered the question regarding the probable malaria case definition.

5.2.1.3 Use of IDSP stamp: -

Last three days OPD papers were checked for use of IDSP stamp on it. At health facility level (PHC & CHC) (N=20), 55 percent of health facilities did not use IDSP stamp on the case papers. Others reported either unavailability or they hadn't started using it. Thus, though medical officers had the IDSP manual and knowledge about the case definition, the data were not recorded in a standard way (without IDSP stamp) which allows room for error. In addition a number of uncommon abbreviations were found in OP registers which can lead to incorrect tallying of data.

5.2.1.4 Proceedings with suspected malaria case: -

The above question was asked to the lab technician & health worker. All of them (N=24) had given satisfactory answer, which matched the IDSP protocol. Here the male health worker's duty was to do active surveillance and female health workers were detecting malaria passively (during ANC check ups, immunization OPD).

5.2.2. Diagnosis of Malaria

5.2.2.1 Capacity to collect blood specimen

All sub-centers and PHC/CHC staff (N=44) answered that they were able to collect the blood for suspected malaria. Required materials were present at all visited health facility (N=20). (Slides and stains were available)

5.2.2.2 Capacity to transport specimen to higher laboratory

There was capacity at all levels to transport specimens to higher reference labs (N=16).

5.2.2.3 Diagnosis of malaria within a week

All lab technicians (N=16) reported that the OPD cases of malaria were confirmed on the same day whereas the cases referred by the health worker (slides) were confirmed within seven days of receiving of slides. Four out of 16 (4 CHCs & 12 PHCs) were cross-checked for records for period of previous two weeks. The duration between the date of receiving slide and that of confirmation was within a week for all the four health facilities.

5.2.2.4 Knowledge of reference lab

This question was asked to lab technician and out of total 16 lab technician 14 knew about the referral Laboratory at state level.

5.3. Reporting

5.3.1. Total reporting units

In the studied districts, district-1 had 32 government reporting units (RU) with no private sector involvement. For district-2, there were 64 government RU and also two private RU.

Table 6: total reporting units in IDSP Gujarat

Name of institution	Government Reporting units	Private reporting units	Total
Districts (25)	1367	32	1399
Municipal Corporation (6)	75	15	90
Medic al college (6)	52	0	52
Total	1494	47	1541

All the systems required reports to be passively sent to the next higher levels. The private sector involvement was only three percent. According to norms, at least one private facility per block should be involved in surveillance reporting. The reasons identified for the very low involvement of the private sector were lack of incentives and no regulation for participation.

5.3.2. Availability of register

PHCs & CHCs were checked for rumor register & presumptive surveillance register. Out of the total 20 facilities verified four didn't have the rumor register. All facilities had registers for presumptive surveillance and in six of them; the pharmacist was maintaining presumptive surveillance register. Four facilities had not maintained these registers for the last two weeks. Out of the eight health workers interviewed, seven had register for syndromic surveillance. Among those seven, one health worker didn't maintain it for the last two weeks.

5.3.3. Shortage of reporting forms in last 6 months

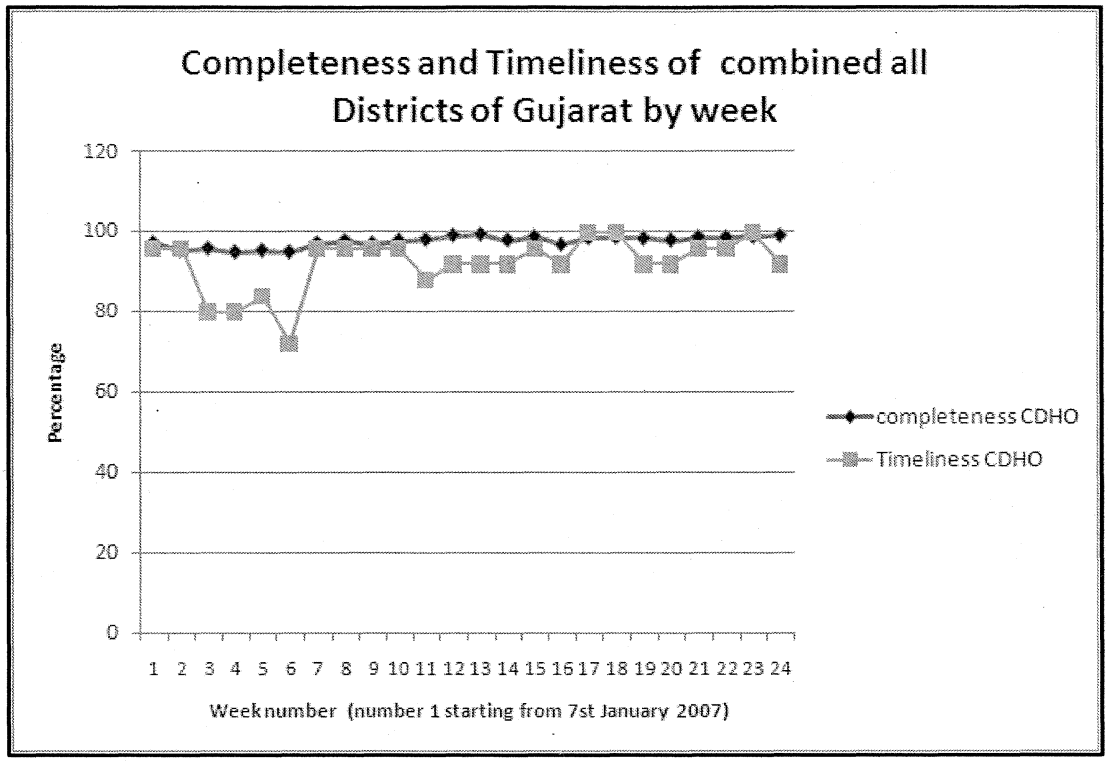
Out of total 52 health professionals only one medical officer reported about shortage of reporting forms in last six months.

5.3.4. Completeness and Timeliness of Surveillance Reporting

Completeness and timeliness are key indicators of reporting performance. These are defined as the proportion of expected reports received (completeness), and the proportion of expected reports received on time (timeliness). Reports were considered late if they had not been received by the established deadline. Calculation of completeness of reporting included all of the reports received late and on time.

The studied district 1 showed 100% completeness and 100% timeliness, where as district 2 showed 71% timeliness and 95% completeness (range: 84-100). Reporting was particularly weak among district civil and urban hospital. They did not report for 9 & 8 times respectively out of total 24 times. When inquired about poor reporting performance in some facilities, it was found that the periods of poorest performance often correlated with those periods when the person responsible for reporting was away from the post, remote location of health facilities, vacant posts and administrative problems at district civil hospitals.

Graph 1: Completeness & Timeliness of reporting unit Gujarat state



The timeliness & completeness of IDSP reports in all districts of Gujarat state for first 6 months in year 2007 is given below (ANNEX 6 & 7).

For Gujarat state, the timeliness for all districts (CDHO) was 89% (districts range 51-100) and completeness was 98% (districts range: 91-100) in first 6 months of the year 2007. The urban area MOH had completeness of 87% and timeliness just 61%. And Medical colleges (N= 6) had completeness of 97% and timeliness 69%. An explanation for this type of finding could be low percentage (43%) of trained medical officer staff in Urban MOH than that of rural medical officers (86%).

5.3.5. Data Reporting Comparison Between two surveillance system

Though the reporting staffs for the malaria cases in IDSP and in NVBDCP were same, still there was a difference between the reporting of malaria positive cases in the studied districts. The average difference in reported positive malaria cases in District-1 was 2.05

cases per week among the two reporting systems with highest difference being 11, and in District-2 the difference were 2.4 cases per week with highest difference being 21. The key respondents agreed with these findings and mentioned about the new common reporting form between NVBDCP & IDSP for malaria, which was in its final process of launch, curtailing this type of error.

5.3.6. Accuracy of reports

Cross checking of malaria positive cases in last two weeks was done for 9 health facilities (2 CHC and 7 PHC) out of total 20. The positive patients list from register was taken and visited back at their home to verify the correct entry. All had registered entry correctly. Out of the eight sub centers two sub centers were checked for the same and the case entry was found to be correct.

5.4. Analysis

5.4.1 Routine Analysis

The comparison of routine analysis between two districts was done using nine parameters. WHO/AFRO recommends two specific types of analysis – tracking of monthly malaria inpatient cases and deaths and long-term trend analysis (for example year to year) of malaria, both for children aged less than five years and total population. The findings are given below.

Table7: - Comparison of routine analysis in studied area

Parameter Observed as routine analysis		District-1	District-2	State IDSP cell
Timeliness		√	√	√
Completeness		√	√	√
Defaulters		√	√	√
Disease trend		√	√	√
Malaria Trend	Monthly	√	√	√
	Weekly	√	√	√
GIS mapping		X	X	√
List of top 10 high risk area for malaria (in collaboration with NVBDCP)		√	√	NA
Denominator (a) <5 year population		√	√	√
(b) Total population		√	√	√
Tallying of date for PHC confirmed IDSP malaria report and focal spraying report in non endemic area (Period of one month)		90%	80%	NA

The IDSP in collaboration with NVBDCP analyze the routine data for malaria. Though both the districts scored well in all nine parameters, some issues came into notice.

The information regarding number of out breaks of malaria and related data of morbidity and mortality for last 3 years was not documented either in NVBDCP or in IDSP. Though computers were available at all PHCs, Medical officers did not perform trend analysis.

When explored the reasons for not doing, it was found that the data analysis at every level required repetitive training which lacked due to high turn over of staff and deficiency of staff at every level. Also, as the lower health facility staff gets the weekly feedback and analysis from district level officials regularly, the felt need for analysis at lower level was low.

5.4.2 Planning and action based on data

The idea behind tallying the report of the 'focal spraying' with IDSP reported malaria case was to see how much routine analysis was used for taking action. For District-1, 90 percent of the date matched with that of IDSP report and for District-2, it was 80 percent. (Table 7)

5.5. Epidemic preparedness

5.5.1 Epidemic Preparedness Infrastructure

IDSP budget guideline was found in each District. Also state Government budget had 2245 crores rupees head grant spare for natural disaster. The epidemic preparedness plans submitted by both districts in their 'District Health Action Plan' year 2007-12 under NRHM were reviewed. The results are shown in the table below.

Table 8: IDSP plans under NRHM (2007-2012)

Element	District1	District2	Total
Staffing	√	√	2
Buffer stocks	√	√	2
Training	√	√	2
Health education	√	√	2
Preventive action (Chlorination/ Gambu fish)	√	√	2
Office automation	√	X	1
Total	6	5	92%

Note: - √ means element was taken in to account in planning. X means element was not taken in to account in planning.

State level RRT (Rapid Response Team) & district level RRT were assigned for management of any epidemic outbreak. Out of total 101 team members of RRT, 49 were trained for epidemic preparedness. Both the districts under study had their district level and Taluka level RRT team documented. IDSP mainly concentrated on the waterborne outbreaks. The Malaria outbreaks information was kept by the NVBDCP only.

Existence of a written case management protocol for malaria epidemic was lacking at all PHC/ CHC level.

5.5.2 Epidemic threshold Knowledge

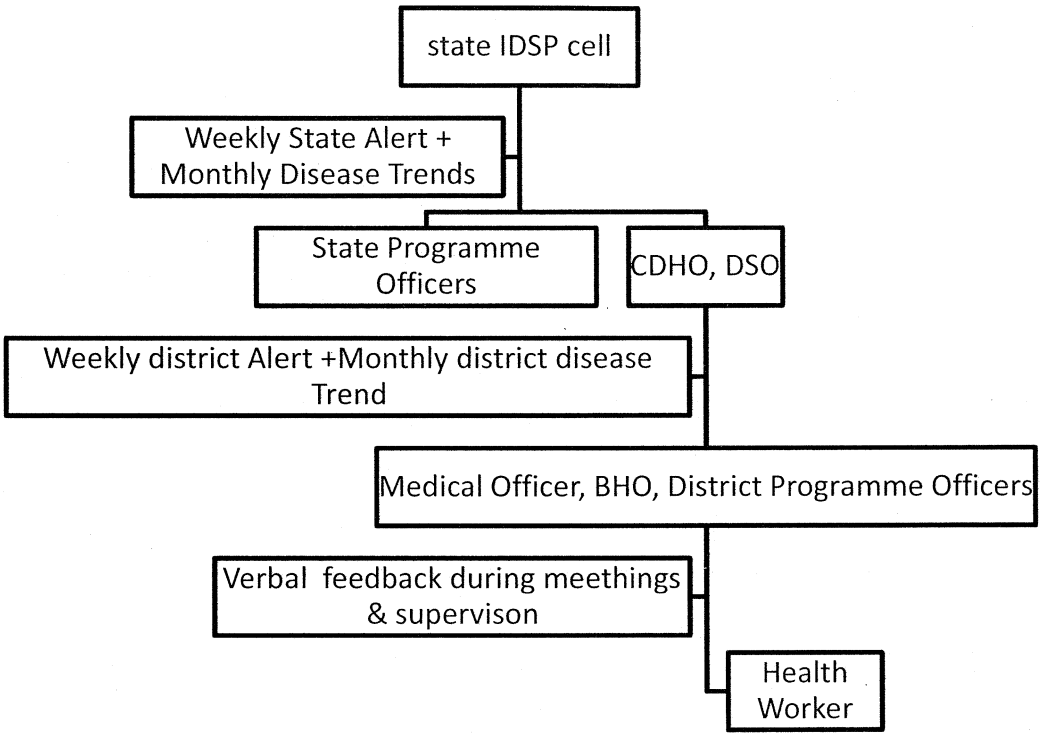
Epidemic threshold knowledge regarding malaria was asked at all levels of health facility. Out of the eights health workers seven knew about the local epidemic threshold. At PHC & CHC level out of 20 officers 13 knew about the epidemic threshold level for malaria. And at District level (BHO, DSO, CDHO) out of total eight officers only four gave the satisfactory answer for malaria epidemic threshold. The lack of emphasis on this component in training of higher officials could be one of the reasons for low awareness among higher officials.

5.6. Outbreak Management

As there were no outbreaks in the study districts during study period, RRT response to any epidemic could not be assessed for these districts. To confirm whether there was really no outbreak, records were checked for case data and verified for any unusual rise or crossing of threshold limit during the data collection period. In both district no unusual rise or crossing of threshold was found during the study period, which indicated good quality of routine analysis of data.

5.7. Feedback

Flow Chart 3: feedback pattern observed in the system



The frequency of feedbacks in the two districts are given below for last 3 months. All Medical officers (BHO + MO) (N=24) replied when interviewed that in the last 3 months, in addition to written feedbacks they also got weekly district alerts (12) and monthly district disease trend reports (3). All the CDHO, DSO (N=4) replied that they were getting weekly state alert report and monthly state disease trend report without fail during last 3 months. Health workers (N=8) replied that they were getting feedback by medical officer as and when required during meetings as well as during supervisory visits by DSO. On asking the opinion about the feedback, 96% (50 out of 52) replied that, they felt that the feedback was positive in nature. The common feedback topics were quality of reports (49%) and assistance in task (60%). There were no feedbacks given by means of quarterly or yearly bulletin by central MOH regarding technical updates in last 3 months.

5.8. *Supervision*

Central team from Delhi (World Bank team accompanied by NICD officers) had visited Gujarat state for IDSP implementation progress on 7-9 May 2007. By IDSP protocol, the supervisory visits should be at a rate of one visit per facility per month.

In the studied districts the reported numbers of supervisory visits by CDHO and DSO in the last three months are given below.

Table 9: Supervision

	Supervisory visits by CDHO/DHO in last 3 months	Supervisory visits by DSO in last 3 months
District 1	3	12
District 2	5	18

District-2 had faced a major epidemic in 2004. This could be the probable reason behind more number of supervisory visits in the district.

On asking how many times you have been supervised for IDSP by DSO / BHO in last three months, the answers given (by medical officer, health worker, lab technician) ranged from 1 to 9 with mean value of 4.

5.9. *Coordination*

Strengthening surveillance at the district level involves working with a variety of partners (or stakeholders) both within the health system and outside it. These partners may include vertical program officers within the health sector (such as NVBDCP), and other community leaders. . Chief District Health Officers of studied district and State IDSP nodal Officers were asked about their communication and coordination with others during the previous six months in two particular areas: sharing data & coordinating resources.

The results are given below.

Table 10: Coordination

Element	District1	District2	State IDSP cell
Community involvement in prevention	Yes	Yes	Yes
Sharing data & Coordinating resources with NVBDCP	Data regarding disease & human resource coordinated	Data regarding disease & human resource coordinated	Data regarding disease coordinated with all program officers but outbreak related morbidity and mortality data were not shared between IDSP and NVBDCP

Both the CDHO showed examples of various campaigns (for example cycle rally, school children rally), which involved community. Also they conducted a monthly meeting with DMO and DSO to coordinate the activities of both programs. The state IDSP officer invited all program officers of different department at state level to participate in their IDSP meeting and to discuss some coordination issues.

On a negative note data regarding outbreak related morbidity and mortality were not shared between IDSP and disease control programs. Here the IDSP didn't have the figures regarding the number of malaria outbreaks and the mortality and morbidity statistics associated with it, which was available with NVBDCP.

5.10. Training

Training status under IDSP- May 2007: - Out of total 105 required master trainers, 94 had been given training. Data entry operators had not been trained for IDSP and 7 out of 25 districts had no data entry operators. 171 block health officers were trained.

Table 11: Training status in Gujarat under IDSP (till May 2007)

	Medical officer (CHC+PHC)		Medical officer (general Hospital)		Workers, supervisors & pharmacist		Laboratory technician (state+ DPHL)		Laboratory technician (PHC+CHC)	
	Training load	complete	Training load	complete	Training load	complete	Training load	complete	Training load	complete
Total	1722	1482	364	156	11649	10476	54	51	988	749
%	86.06		42.86		89.93		94.44		75.81	

Here the Medical officer (general hospital) training was found to be 42.86% which was low as compared to other staff's training status, which could contribute to the lower compliance (timeliness and completeness of reports) in urban area.

Table 12: Observed training status among the sampled staff

Health professionals	Total visited	Trained for IDSP	Reason for not trained
Health worker	8	7	Newly appointed
Lab technician	16	16	-
Medical officer	20	20	-
BHO	2	1	Trained as MO
DSO	2	2	-
CDHO	2	2	-
IDSP state officer	1	0	Trained & Worked in NSPCD

During the in-depth interview with State IDSP nodal officer, CDHO, DSO and Medical Officer, the barriers in providing effective training to the health staff were reported to be high turn over of staff, vacancy and change in the reporting format every 2-3 years.

5.11. Laboratory

The laboratory functioning was assessed particularly with reference to malaria. It was found that all the laboratories (L1 level, N=20) were equipped with microscopes. Malaria was consistently confirmed in all laboratories assessed. Reagents and supplies shortage was not a problem in the last 3 months (reported). There was a state reference laboratory (L3 level) which also carried out disease and outbreak confirmation. The line listing of diseases like diphtheria was done as probable cases without laboratory confirmation and hence it carried little epidemiological significance. According to key respondents, District Public Health Laboratory (DPHL) will soon be established in four districts which would provide case confirmation (culture & serology) at district level.

5.12. GIS

5.12.1 **Level of health facility at which GIS is used**

The system was using GIS (geographic information system) at state level. At district level GIS use was at primitive level in both districts studied.

5.12.2 **Type of information available on GIS**

At state level they had base maps for administrative boundaries up to district level of Gujarat. Base maps were not available for the geographic part (such as road, rivers and elevation) and geo-referenced village database (facility/school) was also not available

5.12.3 **Training regarding GIS**

Data entry operators were on contract basis and not trained for IDSP/GIS. About the type of GIS software the officer gave the information that the GIS software was custom made and developed by Gujarat State. The software was soon going to change in line with national IDSP software.

5.13. Communications

Table 13: Communication Status in studied Districts

Equipment	District 1	District 2
Computer Telephone	Up to PHC level	Up to PHC level
Fax	Up to BHO level	Up to BHO level
GSWAN	Up to district level	Up to district level

Target sites for EDUSAT installation 34

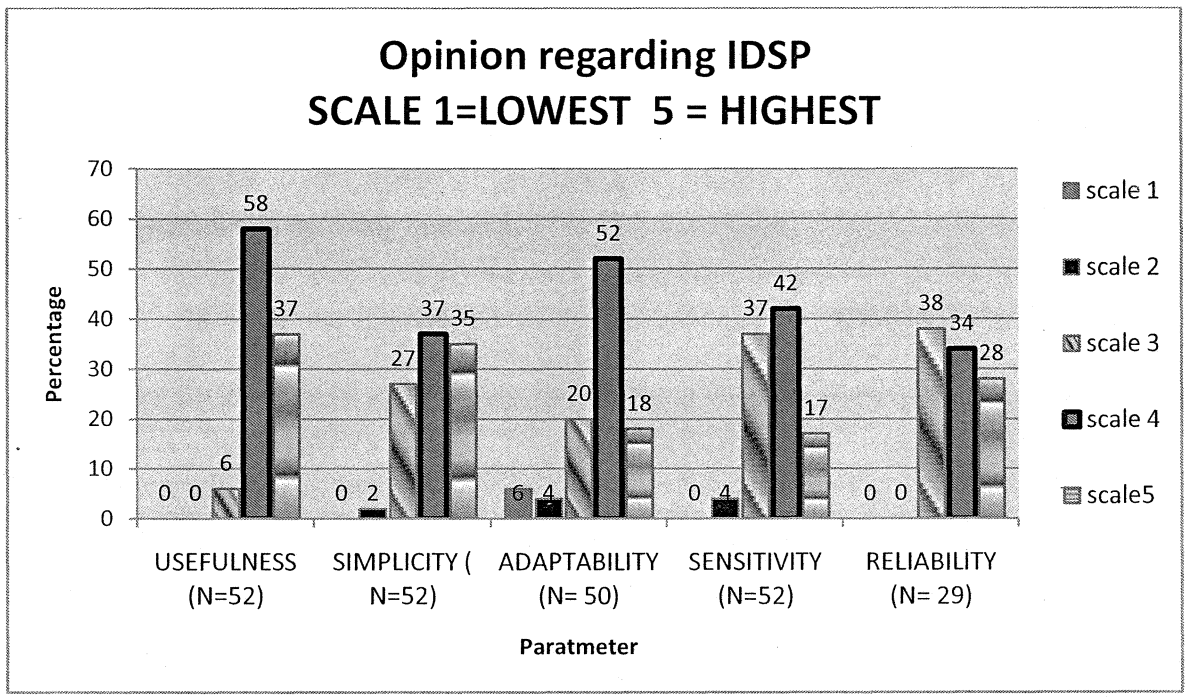
Sites, which were functional 29

Frequency of using the EDUSAT in last 3 months was once monthly with central surveillance unit. The EDUSAT also had component of Video conferencing, which connected CSU to DSU directly (in process). All districts were reporting to the State cell via GSWAN. On asking any major operational constrains experienced, the officer had replied that "the major problem in transmitting the weekly data through IT network was interruption of the GSWAN connectivity."

5.14. Opinion regarding IDSP

Total 52 health professionals were interviewed. They were questioned about the five parameters. The results are given below.

Graph2: - View regarding IDSP from Interview staff (Full table in ANNEX 8)



Interpretation

Usefulness: 37 % of the interviewed staff gave opinion that IDSP was extremely useful and 58% said it to be very useful. Remaining opined it to be useful.

Simplicity: 35 % of the interviewed staff gave opinion that IDSP was extremely simple and 37% said it to be very simple. 27% opined it to be simple & 2% said it was some what simple than in past.

Adaptability: 18 % of the interviewed staff gave opinion that IDSP was extremely adaptable and 52% said it to be very adaptive. 20% opined it to be adaptable & 4% said it was some what adaptable. Six percent said IDSP was not at all adaptable to the situation.

The reason for lower adaptability given by the health worker was that in rainy season the surveillance reporting becomes daily and overall large amount of vacancy in the health worker cadre (vacancy at post for MHW 72%, and for FHW 23%) created difficult situation to fulfill the task. In this situation usually they had been assigned extra duty, which was sometimes practically impossible to do.

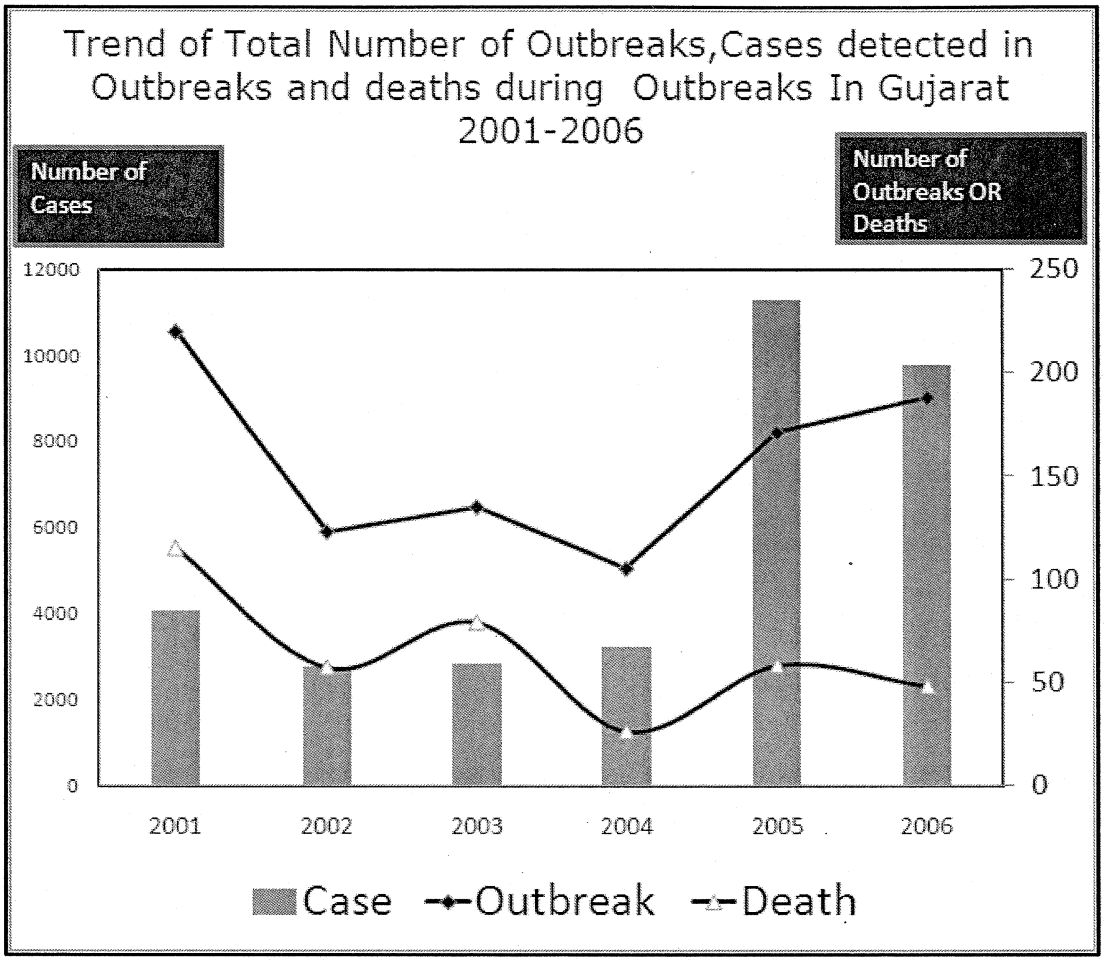
Sensitivity: 17 % of the interviewed staff gave opinion that IDSP was extremely sensitive and 42% said it to be very sensitive. 37% opinioned it to be sensitive & 4% said it was some what sensitive in detecting outbreak.

Reliability: - 28 % of the interviewed staff gave opinion that IDSP was extremely reliable and 34% said it to be very reliable. Remaining opined it to be reliable.

On asking overall satisfaction with the IDSP, 94% health care provider (N=52) showed satisfaction with the system.

5.15. Review of surveillance data before and after implementation of IDSP in Gujarat state

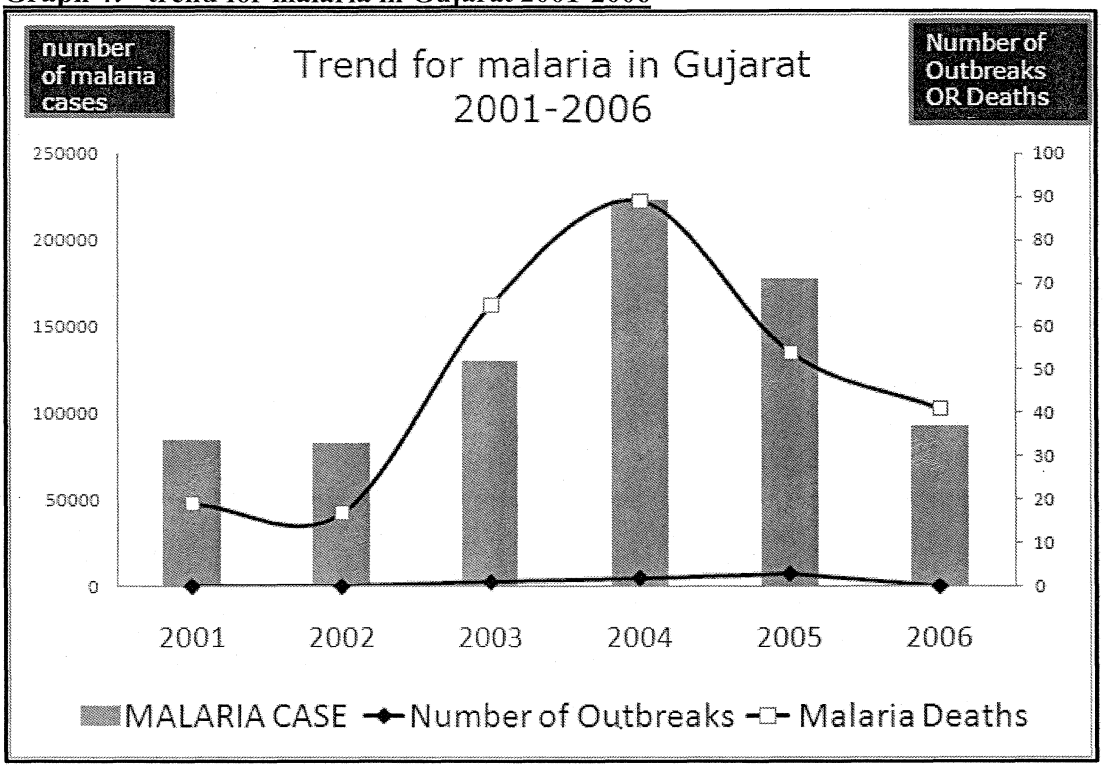
Graph3: -Records of outbreak detected in Gujarat since 2001(ANNEX 9, 10)



Data Source: State Epidemic Cell, Gandhinagar (Table given in Annex)

Interpretation: Surveillance started in all district from 2004 July. It can be noticed that reporting of the number of outbreaks and cases are increasing whereas the numbers of reported deaths are decreasing. This means that outbreaks are being detected earlier than before which can be one of the explanation in reduction of deaths.

Graph 4: - trend for malaria in Gujarat 2001-2006

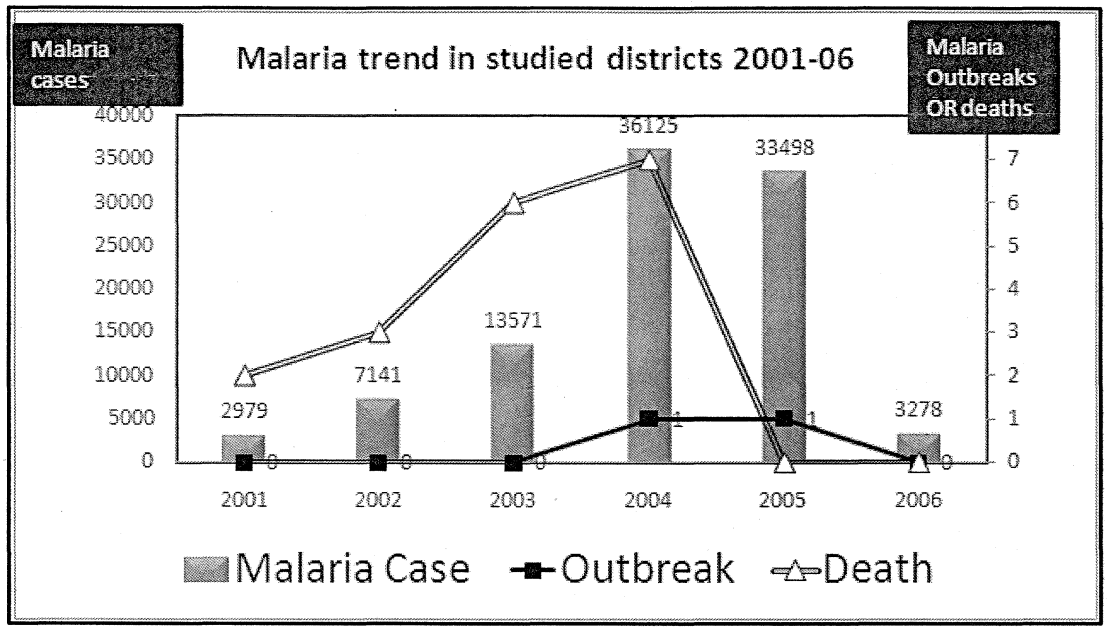


Data Source: NVBDCP, Gujarat (Table given in ANNEX)

Interpretation

Gujarat state faced a major epidemic of malaria in 2003 (Valsad) & 2004 (Kheda). Excluding the two epidemic years , as compared to year 2001 & 2002 when there was no weekly reporting system(paper reporting was done on monthly basis), the case detection rate had increased from year 2005 onwards. This can be attributed to the weekly reporting system followed in IDSP and seasonal weekly reporting by NVBDCP. (Note: since Jan 2007, the NVBDCP was also reporting on a weekly basis through out the year).

Graph 5: Malaria trend in studied districts



Interpretation:

In studied districts also we can notice the same trend of increase in case detection and decrease in deaths after implementation of IDSP.

6. CONCLUSION & RECOMMENDATION

This evaluation revealed a number of areas in which the integrated disease surveillance project was performing well, and identified a few areas that required strengthening. This section summarizes the strengths and challenges of IDSP in the two districts and discusses recommendations to strengthen IDSP.

6.1 Strengths

- There was a well established infrastructure for surveillance system in all districts which provided electronic data reporting on a weekly basis. (Received award for innovation).
- Surveillance data showed a definite increase in trend in case and outbreak detection and decrease in deaths which indicates favorable outcome for IDSP. The parallel pre existing surveillance system of malaria also helped in managing the disease situation. So activities related to controlling the outbreak (focal spraying, drug impregnated nets distribution) were done with ease.
- Laboratory confirmation for malaria was consistently found at every level.
- Compliance of the system – Timeliness & completeness of the reported data was good (89% and 98% respectively) at the rural reporting units.
- The routine weekly analysis of data at state and district level was found to be consistent and of the desirable standards. This was followed by regular feedback & supervision to concerned units.
- Specifically assigned Rapid Response Teams along with allocation of funds up to taluka level ensured the epidemic preparedness of the system.
- Attitude & satisfaction of health staff regarding IDSP was found fairly high which is a good sign for the future of the project.

6.2 Challenges

- Reporting systems were weak in terms of data documentation and the data were not recorded in a standard way in 55% of health facilities visited. Though medical officers had the IDSP manual and knowledge about the case definition, the data were not recorded in a standard way (without IDSP stamp) which allows room for error. In addition a number of uncommon abbreviations were found in Out Patient registers which can lead to incorrect tallying of data.
- The involvement of private sector is still minimal (3%) and the strategies of involving them were not shown by any district studied. The private sector was not trained in IDSP and no incentives were made to involve them.
- Compliance of the urban sector in reporting was low.
- Documentation of Outbreaks. For malaria there was a poor inter departmental information sharing particularly for outbreaks related morbidity and mortality. The data were also not properly documented.
- The written case management protocol for epidemic situation was not found at any health facility studied.
- Use of GIS was still not up to the desirable standards. The geographic base maps and village wise data can enhance the quality of surveillance. The data operators were not provided on the job training regarding data management at state and district level.

Limitations of the study

- Laboratory functioning was checked for only one disease (Malaria)
- In the absence of any outbreak during study period, all component of Outbreak management were not examined.

6.3 *Table of conclusion & recommendations*

IDSP in the two districts has improved data collection resulting in early reporting and intervention for epidemic control. Even when the number of outbreaks increased in the state number of deaths due to malaria has come down. There is still scope for increasing private participation, using GIS for epidemiological data and using written case management protocol.

Table 14: Conclusions and Recommendations

Conclusion	Recommendations
1. Low private participation	1. Incentive 2. Regulation
2. GIS use not up to desirable standards	1. Training/ Workshops
3. Poor data documentation & absence of written case management protocol	1. Supervision with special emphasis on this component
4. Weak coordination between inter-departmental data sharing	1. Integration of programs (IDSP & NVBDCP)

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8. ANNEX 1- selected indicators

No	Indicator	Indicator definition	Component & element	Type & purpose of indicator	Value	Surveillance level	Method
1	Disease prioritization	Evidence of prioritization of diseases for surveillance	structure priority setting	Process/ output	Y/N/ N	National	Document review, KI interview
2	Intersectoral collaboration net-working and partnership	Existence of intersectroral collaboration, networking and partnerships with other sectors (water, NVBDCP)	Structure Networking & partnership	Process	Y/N/U	National, intermediate peripheral	KI interview, observation
3	Capacity for sharing outbreak related information between neighboring territory	Existence of inter country and cross-border commu-nication during outbreak	Structure Networking & partnership	Process	Y/N/U	National	KI interview
4	Health facilities with standard case definitions	Proportion of health facilities with standard case definitions for diseases to be reported regularly	Core function case detection	Input	%	National, Sub-national	Observation

5	Existence of event based surveillance	Existence of a mechanism to capture unusual or public health events from non-routine sources in the health system (e.g. from the community, media or other informal sources)	Core function case detection	Process	Y/N/U	National, intermediate peripheral community	KI interview
6	Availability of registers	Proportion of health facilities with standardized registers	Core functions case registration	Input	%	District, National	Observation
7	Correct filling of registers	Proportion of HF with correctly filled registers	Core functions case registration	Process	%	District National	Review of registers
8	Existence of rumour log	Existence of rumour log or database for registration of suspected public health events from informal sources	Core functions case registration	Input/ process	Y/N/U	National intermediate peripheral	Observation

9	Confirmation of priority diseases	Capacity to confirm selected priority diseases either within the laboratory or at a reference laboratory	Core functions, case confirmation	process	Y/N/U	National intermediate peripheral	KI interview, observation
10	Documented list of reference laboratories	Presence of documented list of reference laboratories for confirmation of epidemic-prone diseases	Core functions case confirmation	Input/ process	Y/N/U	National intermediate peripheral	KI interview observation
11	Laboratory confirmation of outbreaks	Proportion of outbreaks that are laboratory confirmed	Core functions case confirmation	Output	%	National provincial district	KI interview, document review
12	Surveillance units having epidemic threshold values	Proportion of surveillance units with defined epidemic threshold values for priority diseases	Core functions data analysis & interpretation	Input	%	National, sub-national	KI Interview, observation

13	Adequacy/ availability of supplies and drugs for outbreak management and control	Proportion of public health units that experienced shortage of drugs and supplies for the most recent outbreak (define the time frame)	Core functions epidemic preparedness	Output	%	National sub-national	KI interview document review
14	Capacity for outbreak response	Proportion of outbreaks responded to in the previous 12 months	Core functions response & control	Output	%	National sub-national	Review of documents
15	Feedback disseminated	Proportion of feedback reports disseminate d	Core functions feedback	Output	%	National sub-national	KI interview, observatio n
16	Feedback received	Proportion of feedback reports received from the next high level	Core functions feedback	Output	%	National sub-national	KI interview, observatio n
17	Availability or reporting forms at district levels	Proportion of districts that were not short of reporting forms in the previous 6 months	Support functions standard & guidelines	Input	%	District provincial national	KI interview, observatio n
18	Availability of training manuals modules for surveillance	Proportion of surveillance units with surveillance training manuals	Support functions training	Input	%	National, sub-national	KI interview, observatio n

19	Staff trained on surveillance	Proportion of surveillance staff trained in surveillance	Support function training	Input	%	National, sub-national	KI interview, document review
20	Availability of commu-nication facilities	Proportion of surveillance units with functional commu-nication facilities for immediate, weekly, reporting	Support functions supervision commu-nication	Input	%	National sub-national	KI interview observatio n
21	Availability of functioning computers	Proportion of surveillance units with functional computers for surveillance purpose	Support function finance	Input	%	National sub-national	KI interview, observatio n
22	Timeliness of submission of surveillance reports	Proportion of surveillance units that submitted surveillance repots to the next higher level on time	Quality/ outputs of surveillance systems Timeliness	Output	%	National sub-national	Review of reports
23	Completenes s of data reported	Proportion of surveillance reports with no missing required information	Quality/output s of surveillance systems completeness	Output	%	National sub-national	Review of reports

24	Usefulness of surveillance data	Rating or the usefulness of the surveillance system (for case detection, planning, priority setting & intervention s	Quality/ outputs of surveillance systems Usefulness, simplicity, flexibility, sensitivity, acceptability	Outcome	Scale 1-5	National sub-national	KI interview
25	Simplicity of the surveillance	Rating of the simplicity of the surveillance system(in terms of data collection, compilation, reporting analysis and utilization) by implementer s and users of the system	Quality/ outputs of surveillance systems	Outcome	Scale 1-5	National sub-national	KI interview
26	Flexibility/ adaptability of the surveillance system	Rating of the ability of the surveillance system to adapt to changing needs, as perceived by the national health managers and evaluators	Quality/ outputs of surveillance systems	Outcome	Scale 1-5	National sub-national	KI interview

27	Sensitivity of outbreak detection	Rating of the sensitivity of the surveillance system to detect outbreaks	Quality/ outputs of surveillance systems Usefulness, simplicity, flexibility, sensitivity, acceptability	Outcome	Scale 1-5	National sub-national	KI interview
28	Acceptability of the surveillance system	Rating of the acceptability of the surveillance system by users and implementers	Quality/ outputs of surveillance systems Usefulness, simplicity, flexibility, sensitivity, acceptability	Outcome	Scale 1-5	National sub-national	KI interview
29	Reliability of surveillance data reports	Rating of the reliability of the surveillance data/ reports by implementers and users of the system	Quality/ outputs of surveillance systems reliability	Outcome	Scale 1-5	National sub-national	KI interview

ANNEX 2

SELECTION OF TWO DISTRICTS

NUMBER	DISTRICT	AVERAGE SFR FOR LAST 6 YEARS	RANK OF AVGSFR	TWO GROUP OF AVGSFR
6	Mehsana	0.0352	1	1
25	Porbandar	0.0591	2	1
16	Valsad	0.0689	3	1
8	Banaskantha	0.0700	4	1
1	Ahmedabad	0.0779	5	1
5	Gandhinagar	0.1063	6	1
9	Sabarkantha	0.1094	7	1
18	Dang	0.1345	8	1
11	Godhara	0.2106	9	1
13	Bharuch	0.2302	10	1
14	Narmada	0.2452	11	1
10	Vadodara	0.2586	12	1
22	Bhavnagar	0.2607	13	2
19	Rajkot	0.2719	14	2
23	Amreli	0.2747	15	2
24	Junagdh	0.2866	16	2
7	Patan	0.3030	17	2
2	Kheda	0.3214	18	2
20	Jamnagar	0.3480	19	2
15	Surat	0.3950	20	2
3	Anand	0.4732	21	2
4	Surendranagar	0.6849	22	2
12	Dahod	0.8079	23	2
17	Navsari	0.8240	24	2
21	Kutch	1.1488	25	2

RANDOM SELCTION OF THE DISTRICT FROM EACH GROUP

ANNEX 3

Semi structured questionnaire & observation check list guideline for data collection

Integrated Disease Surveillance Project (IDSP) in Gujarat: An Evaluation with particular reference to Malaria

Achutha Menon Centre for Health Science Studies,

Sree Chitra Tirunal Institute for Medical Science and Technology,

Thiruvananthapuram, Kerala. 695011

Informed written consent:-

I am Dr. Amar Shah, Master of Public Health (MPH) student in Sree Chitra Tirunal Institute for Medical Sciences and Technology, as a part of study conducting study on the facilities that are involved with IDSP project within Gujarat state. In this I am trying to evaluate the IDSP performance in various districts. As a part of the sampling procedure, this health facility also has been included in my study. I would like to ask you some questions regarding IDSP functioning, which will take 15-20 minutes time. I have taken permission from the identified higher officials including the Health Commissioner Gujarat for this interview. Your identity and the identity of this health facility will not be mentioned anywhere and the information given by you will be kept confidential and will be used for research purposes only. There is no direct benefit to you but results of this study can benefit the project and thus community. Participation in this study is purely on voluntary basis. You can refuse any specific question or decline to answer the interview as a whole.

My guide Dr. K.R. Thankappan at Achutha Menon Centre, Thiruvananthapuram, Kerala) is available to answer any questions about this, should you have any doubts. His address & phone number is as follows.

Address: Achutha Menon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Science & Technology, Thiruvananthapuram. Kerala. 695011

Phone: 0471 – 2524231.

As part of routine procedure it is necessary for me to obtain written informed consent from the participants in my study as well. If you decide to participate please do sign this document in the space below. You can also signify your consent orally if you chose to.

Is the participant willing to sign? : yes 1, no 2.

Signature of the participant:

Signature of the witness (in case of oral consent):

Signature of the interviewer:

Date: Health facility code: District code: no: category:

Type and code of health care facility: SUB CENTRE ☐

Designation & code of the interviewed person: MULTI PURPOSE HEALTH WORKER ☐

1. Observe for availability of registers
   - Syndromic surveillance register for HW

   Yes □ No□ not maintained for last two weeks □

2. Proceedings with suspected malaria case
   - How will you classify the patient with fever?

   Answer given satisfactorily: Yes □ No□

3. At which threshold of fever cases will you take trigger 1 action?
   Answer given satisfactorily: Yes □ No□

4. Approximately how many times reporting forms (FORM S) were not available on time in last six months?
   Answer: ☐

5. Capacity to collect blood specimen. Slides and ink medium available? Yes □ No□

6. Do you receive feed back every week?
   Yes □ No□

7. How many fever cases have you registered last week?
   Answer:____

8. How many times have you been supervised in last 3 months?
   without observation □

   with observation□ ☐

9. Have you received training regarding IDSP?
   Yes □ No□

For the following questions rate your opinion

1 = least and 5 = maximum

10. How do you rate the usefulness of the IDSP (for case detection)? 1= not at all useful 5= extremely useful	1 2 3 4 5
11. How do you rate the simplicity of the IDSP (in terms of data collection, compilation, reporting, analysis & utilization)? 1=not at all simple 5= extremely simple	1 2 3 4 5

12. How do you rate the adaptability of the IDSP (to adapt changing needs)? 1 = not at all adaptive to situation 5= extremely adaptive to situation	1 2 3 4 5
13. How do you rate the sensitivity of the IDSP to detect outbreak? For example how many cases of Malaria would IDSP detect out of total Malaria cases in your area? 1= not at all sensitive 5= extremely sensitive	1 2 3 4 5
14. Overall usefulness of the IDSP	Yes □ No□
15. Observe for the correct filling of registers. (Check from the register for the Syndromic surveillance, pick any one data which is registered as malaria last week, take address and visit the place and confirm it.) Does it match with the register:	Not done □ Done □ Entry correct □ entry incorrect □

Type & code of health care facility: PHC, CHC ☐
Designation & code of the interviewed person: MO, RMO ☐
1. Observe for availability of registers • OP/IP register for presumptive surveillance Yes □ No□ not maintained for last two weeks □ • rumor register No□ Yes □ not maintained for last two weeks □
2. Standard case definition • Manual present Yes □ No□
• What do you consider as a case of malaria? Answer given satisfactorily: Yes □ No□
• When do you consider malaria as an epidemic in your area? Answer given satisfactorily: Yes □ No□
3. Observe for use of IDSP stamp on a case paper for every suspected malaria case (check for last 3 days OPD paper) not using□ using but inconsistent□ using consistently□
4. Observe the availability of diagnostic material for malaria. Is it present? Yes □ No□
5. Approximately how many times reporting forms (form P) were not available on time in last six months? Answer: ☐
6. Perform trend analysis? Yes □ No□ comment:
7. Existence of a written case management protocol for malaria epidemic Yes □ No□
8. Do you disseminate the report every week? Yes □ No□
9. Do you receive feed back every week? Yes □ No□
10. Have you been supervised in last 3 months? How many times? No□ Yes , without observation □ Yes , with observation □
11. Training received Yes □ No□
12. Observe for communication facility appropriate for that facility.

Yes □ No□ comment:	
For the following questions rate your opinion 1 = least and 5 = maximum	
13. How do you rate the usefulness of the IDSP (for case detection, planning, priority setting & intervention)? 1= not at all useful 5= extremely useful	1 2 3 4 5
14. How do you rate the simplicity of the IDSP (in terms of data collection, compilation, reporting, analysis & utilization)? 1=not at all simple 5= extremely simple	1 2 3 4 5
15. How do you rate the adaptability of the IDSP (to adapt changing needs)? 1 = not at all adaptive to situation 5= extremely adaptive to situation	1 2 3 4 5
16. How do you rate the sensitivity of the IDSP to detect outbreak? For example how many cases of Malaria would IDSP detect out of total Malaria cases in your area? 1= not at all sensitive 5= extremely sensitive	1 2 3 4 5
17. How much you rely on the data generated by IDSP? 1= not at all reliable 5= extremely reliable	1 2 3 4 5
18. Overall satisfaction with IDSP	Yes □ No□
19. Cross checking for last two weeks positive cases	Not done □ Done □ Entry correct □ entry incorrect □

Type and code of health care facility: PHC ☐

Designation & code of the interviewed person: LAB TECHNICIAN ☐

1. Observe for availability of registers
   - Malaria register

   Yes □ No□

2. Standard case definition

   Proceedings with suspected case of malaria?

   Answer given satisfactorily: Yes □ No□

3. Approximately how many times reporting forms (form L1) were short of time in last six months?

   Answer: ☐

4. Knowledge of reference laboratories.

   Yes □ No□

5. Diagnosis of malaria within a week

   No□ Yes without observation □ Yes with observation □

6. Do you disseminate the report every week?

   Yes □ No□

7. Do you receive feed back every week?

   Yes □ No□

8. Have you received training regarding IDSP?

   Yes □ No□

For the following questions rate your opinion

1 = least and 5 = maximum

9. How do you rate the usefulness of the IDSP (for case detection, planning, priority setting & intervention)? 1= not at all useful 5= extremely useful	1 2 3 4 5
10. How do you rate the simplicity of the IDSP (in terms of data collection, compilation, reporting, analysis & utilization)? 1=not at all simple 5= extremely simple	1 2 3 4 5
11. How do you rate the adaptability of the IDSP (to adapt changing needs)? 1 = not at all adaptive to situation 5= extremely adaptive to situation	1 2 3 4 5

12. How do you rate the sensitivity of the IDSP to detect outbreak? For example how many cases of Malaria would IDSP detect out of total Malaria cases in your area? 1= not at all sensitive 5= extremely sensitive	1 2 3 4 5
13. Overall satisfaction with IDSP	Yes □ No□

Type & Code of health care facility: ☐
Designation & code of the interviewed person: BHO, DSO, CDHO ☐
1. Capacity to transport specimen to higher laboratory Yes □ No□
2. Approximately how many times reporting forms were short of time in last six months? Answer: ☐
3. Performing trend analysis No□ Yes , without observation □ Yes , with observation □
4. Taluka rapid response team assigned? Yes □ No□
5. When do you consider malaria as an epidemic in your area? Answer given satisfactorily: Yes □ No□
6. Proceedings with malaria epidemic. Answer given satisfactorily: Yes □ No□
7. Do you disseminate the report every week? Yes □ No□
8. Do you receive feed back every week? Yes □ No□
9. How many supervisory visits made in last 3 months? ☐ without observation □ with observation □
10. Have you received training regarding IDSP? Yes □ No□
11. Observe for presence of a documented list of reference laboratories. Yes □ No□
12. Observe for communication facility appropriate for that facility. Yes □ No□
For the following questions rate your opinion 1 = least and 5 = maximum

13. How do you rate the usefulness of the IDSP (for case detection, planning, priority setting & intervention)? 1= not at all useful 5= extremely useful	1 2 3 4 5

14. How do you rate the simplicity of the IDSP (in terms of data collection, compilation, reporting, analysis & utilization)? 1=not at all simple 5= extremely simple	1 2 3 4 5
15. How do you rate the adaptability of the IDSP (to adapt changing needs)? 1 = not at all adaptive to situation 5= extremely adaptive to situation	1 2 3 4 5
16. How do you rate the sensitivity of the IDSP to detect outbreak? For example how many cases of Malaria would IDSP detect out of total Malaria cases in your area? 1= not at all sensitive 5= extremely sensitive	1 2 3 4 5
17. How much you rely on the data generated by IDSP? 1= not at all reliable 5= extremely reliable	1 2 3 4 5
18. Overall satisfaction with IDSP	Yes □ No□

Type & Code of health care facility: ☐
Designation & code of the interviewed person: state IDSP nodal officer ☐
1. Do you have standard case definition & epidemic threshold protocol? Yes □ No□
2. Approximately how many times reporting forms were short of time in last six months? Answer: ☐
3. Performing trend analysis No□ Yes , without observation □ Yes , with observation □
4. State & district level rapid response team (RRT) assigned? Yes □ No□
5. Do you disseminate the report every week? Yes □ No□
6. Do you receive feed back every week? Yes □ No□
7. How many supervisory visits made in last 3 months? ☐ without observation □ with observation □
8. Have you received training regarding IDSP? Yes □ No□
9. GIS used in IDSP Yes □ No□
10. Base maps available for administrative part Yes □ No□
11. Base maps available for geographic part Yes □ No□
12. Geo referenced village database Yes □ No□
13. Data entry operator trained for IDSP GIS? Yes □ No□
14. GIS software information. Which version Comment:
15. Number of sites need to be connected through IT network EDUSAT/GASWAN ☐
16. Number of sites currently connected through IT network ☐
17. Frequency of usage of IT network in a month ☐
18. Observe for communication facility appropriate for that facility.

Yes □ No□	
For the following questions rate your opinion 1 = least and 5 = maximum	
19. How do you rate the usefulness of the IDSP (for case detection, planning, priority setting & intervention)? 1= not at all useful 5= extremely useful	1 2 3 4 5
20. How do you rate the simplicity of the IDSP (in terms of data collection, compilation, reporting, analysis & utilization)? 1=not at all simple 5= extremely simple	1 2 3 4 5
21. How do you rate the adaptability of the IDSP (to adapt changing needs)? 1 = not at all adaptive to situation 5= extremely adaptive to situation	1 2 3 4 5
22. How do you rate the sensitivity of the IDSP to detect outbreak? For example how many cases of Malaria would IDSP detect out of total Malaria cases in your area? 1= not at all sensitive 5= extremely sensitive	1 2 3 4 5
23. How much you rely on the data generated by IDSP? 1= not at all reliable 5= extremely reliable	1 2 3 4 5
24. Overall satisfaction with IDSP	Yes □ No□
25. Central coordination	Yes □ No□

ANNEX 4

In-depth interview with Key informant

Integrated Disease Surveillance Project (IDSP) in Gujarat: An Evaluation with particular reference to Malaria

Achutha Menon Centre for Health Science Studies,

Sree Chitra Tirunal Institute for Medical Sciences and Technology,

Thiruvananthapuram, Kerala. 695011

Informed consent:-

As you have already answered the some questions now I would like to ask you more about your opinions regarding the functioning of IDSP. There is no right or wrong answers here; I am interested in your opinions only. It will take further 15-20 minutes. In case my notes are incomplete or I need some clarification, I may contact you. Are you willing to continue with the interview?

Yes ☐ No ☐

GUIDELINES FOR IN-DEPTH INTERVIEW

Informants/ Participants:

1. IDSP state nodal officer

2. Chief District Health Officer

Guidelines

1. What is your role in the project (IDSP)?
2. Where did you see the biggest problems in the implementation of IDSP?
3. How do you judge the coordination of the surveillance (the role of the coordination body)?
4. In your opinion, what do you consider to be the most important successes in the last three years in disease surveillance and response?
5. What explains them?
6. What would you recommend that this country's most important priority should be for improving IDSP now?

If aware of the project and involved:

7. What are the strengths and weaknesses of the project that you can identify?
8. Which are the experiences you would wish to share?
9. Your view about existence of intersectoral collaboration with other sectors like NVBDCP, water supply.
10. Your view about existence of inter-state communication during outbreaks.
11. Can you give examples where the project builds on experiences of polio or other successful initiatives?
12. What are the potential areas for success beyond original plans?
13. Are there any unexpected outcomes of the project that you are aware of?
14. What strategies have been implemented for involvement of private sector?

- Strategic alliance through professional association (IMA, IAP)
- Recognition & partnership
- Providing linkages through web or fax or courier or telephone.

15. What are the views of the targeted beneficiaries with regard to the project?
16. From above discussion points how do you judge the implementation of the integrated disease surveillance system?
17. Who else should I talk to who could give me some information on this issue?

Informants/ Participants:

- District surveillance officer
- Medical Officer

Guidelines

1. What is your role in the project (IDSP)?

2. Does the inclusion of Malaria in the IDSP have made any difference in the disease reporting? If yes how?

3. How adequate do you think is the reporting, and why?

4. What do you believe can or should be done to ensure more complete reporting in IDSP?

5. Is there existence of a mechanism to capture unusual fever cases from non-routine source? (E.g. community, other informal source)

6. What do you think about the attitude amongst the healthcare worker about IDSP? What measure will you take to improve their attitude?

Informants/ Participants:

1. health worker

Guidelines

1. What is your role in the project (IDSP)?

2. Does the inclusion of Malaria in the IDSP have made any difference in the disease reporting? If yes how?

3. The feed back that are you getting from the higher IDSP level? How do you feel about it, is it positive or negative feed back?

ANNEX 5

Integrated Disease Surveillance Project (IDSP) in Gujarat: An Evaluation with particular reference to Malaria

Achutha Menon Centre for Health Science Studies,

Sree Chitra Tirunal Institute for Medical Sciences and Technology,

Thiruvananthapuram, Kerala. 695011

Document review & IDSP reports & data by NVBDCP

1. Evidence of prioritization of the diseases for surveillance
2. Number of outbreaks responded to in the previous 12 months.
3. Proportion of staff trained in IDSP (details of each category staff)
4. Availability of materials (computers, training modules)
5. Availability of financial resources
6. Timeliness of submission of surveillance reports.
7. Completeness of data reported.
8. Pre & post IDSP malaria deaths in selected district (NVBDCP)
9. Pre & post IDSP trend of malaria disease in selected district.
10. Case study: Comparison between date of investigation for suspected malaria outbreak pre & post IDSP & correlating it with (SPR) slide positivity rate (data source NVBDCP reports, IDSP reports & outbreak investigation report)
11. Village wise 'focal spraying' report for both districts.

ANNEX 8 OPINION REGARDING IDSP

OPINION REGARDING IDSP

PARAMETER	USEFULNESS					SIMPLICITY					ADAPTABILITY (N = 50)					SENSITIVITY					RELIABILITY (N = 29)					OVERALL SATISFACTION	
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	NO	YES
Medical Officer (N=20)	0	0	3	14	3	0	0	5	5	10	3	0	3	7	5	0	0	9	8	3	0	0	7	5	8	0	20
BHO DSO CDHO (N=8)	0	0	0	4	4	0	0	0	2	6	0	0	0	6	2	0	2	2	2	2	0	0	4	4	0	0	8
LAB TECHNICIAN (N=16)	0	0	0	11	5	0	0	7	9	0	0	0	4	12	0	0	0	5	11	0	NA	NA	NA	NA	NA	3	13
HEALTH WORKER (N=8)	0	0	0	1	6	0	1	1	3	2	0	2	2	1	2	0	0	2	1	4	NA	NA	NA	NA	NA	0	7
STATE IDSP OFFICER (1)	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1
TOTAL(N = 52)	0	0	3	30	19	0	1	14	19	18	3	2	10	26	9	0	2	19	22	9	0	0	11	10	8	3	49
PERCENTAGE	0	0	6	58	37	0	2	27	37	35	6	4	20	52	18	0	4	37	42	17	0	0	38	34	28	6	94

PARAMETER	USEFULNESS					SIMPLICITY					ADAPTABILITY (N = 50)					SENSITIVITY					RELIABILITY (N = 29)					ALL SATISFAC	
PERCENTAGE	0	0	6	58	37	0	2	27	37	35	6	4	20	52	18	0	4	37	42	17	0	0	38	34	28	6	94

	SCALE 1=LOWEST 5 = HIGHEST				
PARAMETER	scale	scale 2	scale 3	scale 4	scale 5
USEFULNESS (N=52)	0	0	6	58	37
SIMPLICITY (N=52)	0	2	27	37	35
ADAPTABILITY (N= 50)	6	4	20	52	18
SENSITIVITY (N=52)	0	4	37	42	17
RELIABILITY (N= 29)	0	0	38	34	28

ANNEX 9: Outbreaks in Gujarat State

year 2001				year 2002			year 2003		
type of disease	**outbreak**	**case**	**death**	**outbreak**	**case**	**death**	**outbreak**	**case**	**death**
cholera	9	33	0	5	66	2	6	64	2
dia-vomiting	140	2154	87	60	1357	34	77	1161	56
jaundice	25	578	5	11	139	2	6	131	1
typhoid	5	55	0	7	118	0	3	53	0
food poisoning	41	1284	23	40	1109	19	43	1450	20

year 2004				year 2005			year 2006		
type of disease	**outbreak**	**case**	**death**	**outbreak**	**case**	**death**	**outbreak**	**case**	**death**
cholera	4	26	0	33	73	2	34	95	2
dia-vomiting	42	790	14	86	2907	36	67	3910	19
jaundice	18	1209	6	48	7882	20	44	4090	7
typhoid	4	189	0	4	446	0	10	243	0
food poisoning	37	1046	6				33	1450	20

Source: **State Epidemic Cell, Gandhinagar.**

ANNEX 10

diseases case/death 2001-2006 Gujarat state trend

	2001	2001	2002	2002	2003	2003	2004	2004	2005	2005	2006	200
	case	death	case	death	case	death	case	death	case	death	case	dea
enteritis	46406	111	44564	41	54031	74	64660	30	91289	40	165684	3
patitis	5881	33	5256	23	5470	17	9233	28	15557	28	14252	18
fever	3358	2	3903	2	4742	0	5502	0	5551	1	13198	
	109	0	60	2	101	3	65	0	84	1	100	
	84459	19	82966	17	130744	65	222807	89	177936	54	92620	4

Source: State Epidemic Branch & NVBDCP. Gandhinagar