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Original Research Article

A Study of Various Components of Malaria Surveillance under Integrated Disease Surveillance Programme (IDSP) in Rural Reporting Units of Ahmedabad District, Gujarat

Kirti Rahul[1], Jatin Chhaya[2], A Bhagyalaxmi[3]
[1]Tutor, Community Medicine Department, PDU Govt Medical College, Rajkot, Gujarat, India
[2]Tutor, Community Medicine Department, Govt Medical College, Surat, Gujarat, India
[3]Associate Professor, Community Medicine Department, B J Medical College, Ahmedabad, Gujarat, India

***Corresponding author**
Kirti Rahul
Email: rahulkirti.d@gmail.com

Abstract: Malaria is one of the major communicable diseases and most debilitating disease that affect the physical and economic wellbeing of people living in endemic areas for malaria. About 95% (1.2 billion) Indian population reside in malaria endemic areas and 80% of malaria cases reported is confined to areas consisting 20% of population residing in tribal, hilly, difficult and inaccessible areas. Approximately 1.5-2 million confirmed cases and 1000 deaths occur annually. In India, diseases surveillance for communicable and non-communicable diseases is carried out under Integrated Diseases Surveillance Programme (IDSP) to detect and report cases for timely implementation of control measures. The present study was conducted to study the various components of malaria surveillance under IDSP at rural reporting units of Ahmedabad district. A total 30 Primary Health Centers (PHCs) and 30 Sub-Centers (SCs) were included in study. A pre-tested and semi-structured proforma was used to collect data. A total 146 staff members of PHC and SC who were present at time of visit were interviewed for case detection and case confirmation, registration, reporting, knowledge of standard case definition, availability of standard guideline and manual, training, supervision, availability of resources, timeliness and completeness of reporting. IDSP has been successfully implemented at all facilities with completeness and timeliness was more than 90% and 80% respectively. More than 90% staffs out of 146 were trained in surveillance. 15% of S forms were found incomplete while discrepancy between S register and S reporting form was found in 18.3% forms during verification.
Keywords: Malaria, Surveillance, Completeness, Timeliness.

INTRODUCTION

Malaria is one of the major communicable diseases and most debilitating disease that affect the physical and economic wellbeing of people living in areas where malaria is major public health problem [1]. Every year approximately 300-500 million cases and 1.5-3 million deaths occur due to malaria worldwide [2-4]. malaria is major public health problem in India. About 95% (1.2 billion) Indian population reside in malaria endemic areas and 80% of malaria cases reported is confined to areas consisting 20% of population residing in tribal, hilly, difficult and inaccessible areas. Approximately 1.5-2 million confirmed cases and 1000 deaths occur annually [5, 6]. In 2012, there were 1.08 million confirmed cases of malaria and 519 deaths reported [7]. National program for control and prevention of malaria has been working since 1953 and initially it was successful in bringing down mortality and morbidity due to malaria, but still there are sporadic outbreak occur every year due to hidden foci of disease, certain areas received less importance, insecticides and drugs resistance and various administrative and technical reasons [8, 9].

To combat this situation, In India, malaria surveillance system has being working since 1960 to detect and report people affected by malaria to timely implement control measures. Now, system has been included in Integrated Diseases Surveillance Programme (IDSP) with other communicable and non-communicable diseases. Though there is successful implementation of web based weekly reporting surveillance system, still sporadic outbreaks are being reported from time to time in different parts of country. This is mainly due to irregularity in reporting and response mechanism as seen that the reporting was

range between 48% – 100% and the less than 40% of outbreaks were detected within one week.[10, 11] So, there is urgent need to address these problems and in general, whole surveillance system needs to be strengthened to achieve the millennium development goal for malaria. The present study was conducted with the objective to study the various components of malaria surveillance under IDSP at rural reporting units (Primary health centre- PHC and Sub-centre-SC) of Ahmedabad district.

MATERIALS AND METHODS

A health facility based cross sectional study was carried out from October 2011 to July 2013 at rural reporting units of Ahmedabad district. According 2001 census, there were total 43 PHCs and 1395701 rural population of Ahmedabad district. A WHO 30 cluster sampling method was used to identify 30 PHCs. A list of PHCs with their population was obtained and sampling interval estimated was 46523. A first PHC was selected by taking random number table 42175 and then adding sampling interval rest of PHCs were selected. One Sub-centre was selected randomly from selected PHC. Thus, total 30 PHCs and 30 SCs were included in study.

A pre-tested and semi-structured proforma was used to collect data. A staff of PHC (Medical officer, Pharmacist, Laboratory technician, data operator) and at SC, Multi-purpose Health Worker (MPW) female who is available at time of visit were interviewed for case detection and case confirmation, registration, reporting, knowledge of standard case definition, availability of standard guideline and manual, training, supervision, availability of resources, timeliness and completeness of reporting. A total 146 health providers (At PHC- 28 MO, 27 AYUSH MO, 30 Pharmacists, 30 laboratory technicians, At SC- 30 MPW female) were interviewed. For assessing timeliness and completeness of reporting previous four weeks reporting forms were verified. Out patients register, laboratory register and IDSP registers (S, P, L) were verified for completeness and to find out and discrepancy in data between registers and reporting forms.

RESULTS

Details about core components of surveillance

Table 1 provides an overview about the core surveillance components under IDSP at PHCs and SCs. Standard Case Definition (SCD) manual available at 35% (21 out of 60) reporting units and mostly in English. Out of 146 staff members interviewed, 65.04% (67 out of 103) staff at PHCs and only 23.33% (7 out of 30) of MPW stated standard case definition correctly.

Table 1: Details of Case Detection, Confirmation, Registration and Notification

Components	PHC n-30 (%)	SC n-30 (%)
Case detection		
Standard Case Definition manual available	12 (40)	9 (30)
SCD stated correctly (SCD) **(n-146, PHC-116, SC-30)***	67/116 (57.7)	7/30 (23.3)
Most common mode of case detection		
Passive surveillance	30 (100)	30 (100)
Active surveillance	24 (80)	17 (56)
Case confirmation		
Mode of confirmation		
Microscopy	30 (100)	30 (100)
RDT	26 (86.6)	13 (43)
List of reference laboratories available	28 (93.3)	NA
Case registration		
Completeness of OPD register	21 (70)	19 (63.3)
IDSP registers		
Completeness of Syndromic surveillance (S) register	NA	18 (60)
Completeness of Presumptive surveillance (P) register	26 (86.6)	NA
Completeness of Laboratory register (L)	24 (80)	NA
Stock out of any of registers	00	00
Case Notification		
Lack of any malaria reporting forms	00	00
Modes of notification		
Internet via email	30 (100)	NA
Telephone	19 (63.3)	12 (40)
Paper	30 (100)	30 (100)

*NA – Not Applicable

Case detection was mostly by passive mode. Active case detection was mainly carried out in outbreak situation as stated by 60% facilities (41 out of 60). Case confirmation was done mainly by blood smear examination at all PHCs with 39 (65%) reporting units (PHC+SC) also used RDT kits for case confirmation for rapid diagnosis in case of seriously ill patients and in outbreak situation.

OPD registers was found incomplete at 30% of PHCs. At 37% of SCs, OPD register was incomplete. The incompleteness of Syndromic, presumptive and laboratory registers were found at 12 (40%), 4 (13.4%) and 6 (20%) facilities respectively. From PHCs, the reports were submitted as soft copy via email and as hard copy through person. Some facilities also inform orally through telephone. From sub-centres, the reports were mainly submitted in hard copy.

Details about data method used to detect outbreak

All the facilities (100%) relied on Syndromic surveillance data supplemented by Presumptive and Laboratory data for detection of clustering of cases. For outbreak/ clustering of cases detection, all the PHCs (100%) made comparison of current data with previous data while 98.3% of facilities analyzed the routine data. Manual of outbreak control was available at only 13 (43.3%) facilities. At 80% of PHCs, previous reports of outbreak or clustering were available.

Table 2: Details about the Outbreak detection

Components	**PHC n-30 (%)**	**SC n-30 (%)**
Data used for outbreak/ clustering of cases detection (multiple response)		
Syndromic data	30 (100)	30(100)
Presumptive data	21 (70)	NA
Laboratory data	24 (80)	14 (46)
Method of outbreak/ clustering of cases detection (multiple response)		
Comparison of data	30 (100)	00
Analysis of routine data	28 (98.3)	00
Manual for detection and control of outbreak available	13 (43.3)	00
Availability of any previous outbreak / clustering of cases report	24 (80)	00

*NA- Not Applicable

Data management and performance of reporting units

Table 3 shows that at 12 (20%) work was pending; at PHC blood slides collected were not examined and at SC blood slides collected were not sent. Microscopy result not received within 24 hours of collection of blood slides at 53.3% of PHCs and 70% of SCs.

Total 65% facilities summarized the routine data in table form. The trend chart of events was available at 24 (80%) PHCs. Only 8 (26.6%) PHCs had calculated the incidence and prevalence of disease.

Table 3: Details about the performance of facilities and management of data

Components	**PHC n-30 (%)**	**SC (%) n-30**
No. of facilities at which work was pending (blood slide not examined within 24 hrs of collection) **N-60**	9 (30.3)	3 (10)
Microscopy result not received within 24 Hrs of collection of BS at PHC **n-30**	16 (53.3)	NA
Microscopy result not received within 24 Hrs of sending BS to PHC (response of MPWs at SCs) **n-30**	NA	21 (70)
No. of facilities where copy of previous reporting forms were missing	2 (6)	6 (20)
No. of facilities summarize routine data and presented it in table form	30 (100)	9 (30)
No. of facilities made trend chart	24 (80)	00
No. of facilities calculate the incidence and prevalence of disease	08 (26.6)	00

*NA-Not Applicable

Assessment of support surveillance components

An IDSP technical manual for surveillance was available at only 12 (40%) facilities. A total 9.4% and 10% of staff members at PHC and SC respectively had received the training in surveillance. A total 27 PHCs and 19 SCs (out of 30 each) were supervised by personnel from higher authority.

Table 4: Details about support surveillance components

Variable	PHC n-30	SC n-30
Availabilities of IDSP technical guideline manual	12 (40)	NA
No. of staff who had not received training in surveillance **N=146**	11/116 (9.4)	3/30 (10)
No. of facilities supervised by higher authority in last months	27 (90)	19 (63.3)

*NA- Not Applicable

Timeliness and completeness of reporting

A timeliness and completeness of reporting forms was assessed for previous weeks which show that more than 90% of forms were submitted to higher authority. In case of timeliness, more than 80% of forms were reported on time.

Table 5: Details about the timeliness and completeness of reporting

No of Reporting forms	No. of forms reported on time (%)	No. of forms reported (%)
S forms n- 120	98 (81.6)	109 (90.8)
P forms n-120	104 (85.8)	114 (95.1)
L forms n-120	101 (84.1)	112 (93.3)

Data quality

A quality of data in terms of completeness of forms was assessed which shows that S forms were more incomplete (15%) than P (5%) and L (7%) forms. Discrepancy between S, P and L forms and respective registers was found in 18.3%, 10.8% and 5% of forms respectively.

Table 6: Quality of data reported

Variables	No. (%), n-120
Incompleteness of reporting form	
S forms incomplete	18 (15)
P forms incomplete	6 (5)
L forms incomplete	8 (7)
Discrepancy observed	
Between S forms and S register	22 (18.3)
Between P forms and P register	13 (10.8)
Between L forms and L register	6 (5)

DISCUSSION

A well implemented and fully functional diseases surveillance system is pre-requisite for any disease prevention and control in any country of the world as well as regular monitoring and evaluation is also necessary for proper functioning of the surveillance system. The Government of India initiated the decentralized state based Integrated Disease surveillance Programme (IDSP) in year 2004-05. The Gujarat state was included in phase II of project and IDSP was launched in Gujarat on 8th November 2005. The state has developed web base weekly reporting system capable of forecasting the epidemics. The present study was carried out using the WHO guideline for Communicable disease surveillance and response system to assess the various components of surveillance with particular reference to malaria under IDSP at PHC and SC level in Ahmedabad district.

The present study indicates that the fully functional web based weekly reporting system has been successfully implemented in all visited facilities; still there are some deficiencies which observed during the study. Knowledge regarding the case definition is utmost important for case detection and under the IDSP Standard Case Definition (SCD) has been developed and disseminated to all health providers in manual format for detection malaria case, but in current study it was observed that the use and knowledge of standard case definition was poor among the staff members at

most of facilities as 57.7% of staff members (67 out of 116) at PHCs and only 23.3% of members (7 out of 30) at SCs stated SCD correctly while the SCD manual was available at only 35% (21 out of 60) of facilities mostly in English which is lower to study done in Maharashtra and West Bengal as in Maharashtra study, 82% of staff stated SCD correctly and SCD manual was available at 52% of facilities while 74% of staff knew the SCD in West Bengal study [12, 13**].**

All 30 PHCs performed blood smear examination for case confirmation with 65% (39 out of 60) facilities stated that they also used the RDT kits for rapid diagnosis of cases in seriously ill patients and outbreak situation. The similar finding was observed in Maharashtra study [13]. All facilities maintained the IDSP registers, P and L registers at PHC and S register at SC, along with the OPD at both level. Incompleteness, in terms of patient's details (demography, diagnosis and treatment received) OPD registers were found at 30% of PHCs respectively while at 37% of SCs OPD register was found incomplete which is comparable to Maharashtra study [13]. Incompleteness of IDSP registers were found at 40%, 13.4% and 20% facilities for S, P and L registers respectively, but no comparative data on completeness is available to compare the finding of present study. But in Maharashtra study, it was observed that no IDSP register was maintained at sub-centres and records of patients were maintained in diary [13].

There was adequate stock of all register and reporting forms and same were supplied regularly at all facilities visited in current study, a finding similar to study done in Iraq while lack of reporting form and registers was found at 28% and 26% of facilities in study done in Maharashtra and Tanzania respectively [13, 14]. From all SCs, the data was delivered in paper based format by health worker to PHC while from all PHCs the gathered data was sent via email and also in hardcopy to higher authority. 51.6% of facilities also reported verbally via telephone / mobile to higher level in case of emergency and difficult transportation as in monsoon. The comparable finding of data reporting in hardcopy (97%) and verbally (68%) was observed in Maharashtra study [13]. All the facilities in present study relied on Syndromic surveillance data for clustering of cases, similar to Maharashtra study. 63% facilities in present study also used the laboratory data to supplement the Syndromic surveillance data as compared to 22% in Maharashtra study [13]. All PHCs had made comparison of routine data with previous data to detect the outbreak while 61.6% facilities also analyzed the routine data for outbreak detection of clustering of cases. The similar finding was observed in Maharashtra study [13]. A standard outbreak management protocol was available at only 16 (26%) facilities as compared to 41% in Maharashtra study [13]. The previous outbreak/ clustering of cases reports were available at 80% (24 out of 60) PHCs while none of SCs produced same.

At 30.3% of PHCs and 10% of SCs, blood slides collected were not examined within 24 hours of collection while microscopy result was not available within 24 hours as reported by 53.3% PHCs and 70% SCs. At eight facilities, copies of previous reporting forms were missing one of S, P and L forms. The comparable finding was also observed in Maharashtra study [13]. Data analysis was done in all PHCs and 80% of them had made the trend chart. Few of the PHCs (8 out of 30) had also calculated the incidence and prevalence rate. The similar pattern of data analysis but comparatively lower finding was also observed in Maharashtra study [13].

A IDSP technical guideline manual was available only at 40% of the facilities. Supervision of PHCs was more regular than SCs as observed in present study. 19 (63%) SCs was supervised in past month when visit made to facility as compared to 90% (27 out of 30) PHCs. In current study, more than 90% of staff member had received the training in surveillance which is higher to study done in Tanzania [14].

The present study, the observed data reporting was 90% for all three type of forms (S, P and L) as majority > 90% of reporting forms were submitted to respective higher level within due date of reporting which is higher than the finding observed in review report of IDSP, Gujarat, while in another report from Orissa, reporting of S, P and L form was 70-90%, 71-80% and 62-80% respectively [11, 15]. More than 80% of forms were submitted on time to higher level as observed in present study which is higher than timeliness (67%) observed in evaluation report from Karnataka [16]. In terms of completeness, S (15%) forms were more incomplete than P (5%) and L (7%) forms as observed in present study. Discrepancy between IDSP registers and respective forms was observed in 18.3%, 10.8% and 5% of S, P and L forms respectively in present study, a finding similar to study from Solomon Island [17].

CONCLUSION

From the finding of the present study, it is concluded that there has been made satisfactory improvement in majority of core and support surveillance components under IDSP at all facilities visited during the study. Chief among them are development of laboratory service (microscopy and RDT kits) for diagnosis, implementation of fully functional computer system with internet connection for data entry and reporting, trained man powers who are involved in surveillance activities, data reporting in terms of completeness and timeliness and lastly regular

supply of registers and forms for case registration and reporting. However, there are some shortcomings those have been observed during the study. The knowledge and use of SCD, data management and analysis were poor particularly at SC level.

LIMITATIONS

Only one SC under selected PHC was assessed. So, actual level of performance of all SCs under selected PHC could not be ascertained. As it was onetime assessment study, it could not be ascertained performance of reporting units over the time period. Hence, longitudinal study is required to assess the performance and lacunae in various component of IDSP.

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