Short Research article

LABORATORY SERVICES AT PRIMARY HEALTH CENTERS UNDER THE LENS: A NEED FOR OVERHAUL

Abstract

Objective- To analyze the status of laboratory services at Primary Health Centers (PHCs) comparing the tribal and non-tribal areas, especially in the context of a decade since implementation of the National Rural Health Mission (NRHM).

Methods- This cross-sectional study was conducted in Maharashtra state, India covering 123 PHCs (61 tribal and 62 non-tribal), using the Short Message Services (SMS) of mobile phones as a data collection tool. The data were processed using ENVAYA SMS software and analyzed using MS Excel software (2007). Chi-square test was applied.

Results- Based on the parameters of availability of lab technician, ability to perform basic tests and availability of operable equipment, only 9.7% (12) of the 123 laboratories studied, were found to be "functional". The availability of laboratory technicians was significantly lower in the non-tribal PHCs (67.7%) as compared to the tribal PHCs (91.8%).

Conclusions- The study casts aspersions on the ability of the PHCs to provide rational medical care based on sound diagnosis. The status of dysfunctional laboratories at the PHCs points to administrative deficiencies of the government in ensuring the availability of basic laboratory services, as well as the need for strengthening external governance through community based monitoring.

Key words – Primary health center, laboratory services, status

Introduction

Primary Health Centers (PHCs) are the first-line contact for healthcare in the rural areas of the country. Laboratory services provide crucial support in the clinical management at PHCs. A proper diagnosis can not only improve the treatment modalities and hence the clinical outcomes, but can also bring down the cost of treatment by minimizing the use of the syndromic approach to treat minor ailments [1].

Facilities like laboratory support along with other infrastructural facilities are the important determinant influencing the utilization of health services [2].

Ensuring basic laboratory services at PHCs can not only improve the quality of medical care to the local community, but will also create a greater demand for essential drugs at the facility, thus improving the potential of the PHC as a center providing primary healthcare [3].

The National Rural Health Mission (NRHM) launched in 2005, emphasized the strengthening of primary healthcare, including laboratory services. However, the Comptroller and Auditor General (CAG) of India report of the performance audit of the implementation of the NRHM noted a 52% shortage of laboratory technicians at the PHCs [4].

It thus becomes important to know the status of the laboratory services at the PHCs, especially in the context of a decade of NRHM implementation.

The present study was conducted with the aim of analyzing the status of functioning of laboratories at PHCs, comparing the tribal and non-tribal areas in the state of Maharashtra, India.

Material and methods

Study setting

This study was conducted in Maharashtra state as part of the Community-based Monitoring and Planning (CbMP) initiative. The CbMP is an initiative in project mode under the NRHM to involve communities in improving the functioning of the public health facilities, to achieve better health outcomes. In Maharashtra state, SATHI (Support for Advocacy and Training to Health Initiatives) is the nodal agency for implementation of the project. Presently the project is implemented in 125 PHCs spread across 13 districts of Maharashtra in partnership with local non-government organizations

(NGOs). The project area and modalities are finalized in consultation with the Government of Maharashtra. Since CbMP is carried out in conjunction with the Government of Maharashtra, no separate approval was taken for the study.

The present study was carried out in 123 out of the 125 PHCs covered by the CbMP program, 61 of which were tribal PHCs and 62 were non-tribal PHCs. Of the total 1,811 PHCs in the state, the present study covered 6.8% of the PHCs, and 19.4% of the 315 tribal PHCs.

Study design

This was an observational cross-sectional study utilizing the Short Message Services (SMS) of mobile phones as a data collection tool to analyze availability of functional laboratories at the selected PHCs. The study was carried out between May 2014 and August 2014.

Data collection and data analysis

For the purpose of the study, a 'functional laboratory' was defined as one where a technician was available, routine basic tests like blood, urine and sputum examination were being performed and where essential equipment in the form of microscope, colorimeter and glucometer was found to be in operable condition. This definition was adopted considering the simultaneous existence of all these factors being critical for the proper functioning of laboratories. In addition, the presence of adequate water supply for the laboratories was also studied. A pre-coded questionnaire was designed for the study, to assess the functionality of the laboratory. The items in the questionnaire for this study were prepared using the list of essential equipment, reagents and glassware at PHCs from the Indian Public Health Standards (IPHS) revised guidelines 2012 [5]. The questionnaire was pretested.

The investigators were personnel of the partner organizations working on a regular basis on the CbMP project. Specific training and demonstration was imparted to them to collect data at the PHCs and also to use the SMS facility for communicating the data.

The investigators visited the laboratories of the 123 PHCs for administering the questionnaire. Investigators interacted with lab technician/medical officer for filling up the questionnaire. This was accompanied by physical observation for availability of water. They communicated the answers as three different SMSs to manage word space in a single text SMS.

The data were processed using ENVAYA SMS software and analyzed using MS Excel software (2007). Chi-square test was applied to test for statistical significance. Probability of less than 0.05 was considered as significant.

Results

Presence of functional laboratories

Out of the total 123 PHCs, based on the parameters mentioned, only 9.7% (12) of the study laboratories were found to be 'functional'.

The status of the parameters for a functional PHC laboratory in the tribal and non-tribal areas is given in Table 1.

Table 1: **Status of laboratory services in tribal and non-tribal PHCs**

Parameters of a functional laboratory at PHC	**Availability in tribal PHCs (61) % (n)**	**Availability in non-tribal PHCs (62) % (n)**	**Total (123) % (n)**	**P value**
Lab technician	91.8 (n=56)	67.7 (n=42)	79.7 (n=98)	*0.0009**
Basic tests				
Blood	90.2 (n=55)	69.4 (n=43)	79.7 (n=98)	*0.004**
Urine	90.2 (n=55)	66.1 (n=41)	78.0 (n=96)	*0.001**
Sputum	49.2 (n=30)	33.9 (n=21)	41.5 (n=51)	*0.084*

All three tests available simultaneously	49.2 (n=30)	33.9 (n=21)	41.5 (n=51)	*0.084*
Equipment				
Colorimeter	50.8 (n=31)	38.7 (n=24)	44.7 (n=55)	*0.176*
Microscope	96.7 (n=59)	93.6 (n=58)	95.1 (n=117)	*0.414*
Glucometer	60.7 (n=37)	62.9 (n=39)	61.8 (n=76)	*0.797*
All three equipment available simultaneously	24.6 (n=15)	27.4 (n=17)	26.0 (n=32)	*0.720*

* Significant

It can be seen that in the non-tribal PHCs, the availability of laboratory technicians was significantly lower as compared to the tribal PHCs. The performance of tribal PHCs to undertake basic tests like urine and blood tests was significantly better than non-tribal PHCs.

It was observed that in 41.5% (51) of the PHCs, all the three tests were not available simultaneously. Of the three tests, the sputum test, essential for diagnosis of TB under the Revised National Tuberculosis Control Program (RNTCP), was not available in more than half of the studied PHCs and there was no significant difference in tribal and non tribal PHCs There was no difference in the tribal and non-tribal PHCs with respect to the availability of the equipment in operable condition. It was found that in only 26.0% (32) PHCs, all three equipment were available and in operable condition.

In addition, it was revealed that 22.0% (27) of the surveyed PHCs did not have proper facility for water.

Discussion

It is essential that laboratories are functional at the PHCs. In view of the considerable efforts under the NRHM on the strengthening of public health facilities, it is worthwhile to examine the functioning of the laboratories at the PHCs, since they offer an insight into the medical care provided at the primary care level. The study offers a snapshot of the functioning of laboratories at PHCs in Maharashtra, which is one of the states with better health infrastructure and health indicators in the country. In this regard, it is distressing to note that in the 123 PHCs that were surveyed, 90% of the laboratories were dysfunctional to varying degrees.

Analysis of the various issues related to functionality of the laboratories reveals that availability of the requisite personnel is significantly lower in non-tribal areas. This may appear counterintuitive, but may be explained by the greater emphasis of the government in making available public health services in the tribal areas considering their greater need.

In case of performing basic investigations (blood, urine testing) the non tribal PHCs shows significantly lower ability. It may be due to patient based investigations as well as better utilization of public services in tribal areas. However, with respect to availability of laboratory equipment and sputum test the difference was less pronounced. This may possibly be due to the central purchase and distribution of equipment and national protocols for performing tests like sputum test. Nevertheless, there should be cause for concern when only 44.7% of the laboratories have functional equipment.

Another serious issue coming to the fore is that less than half the PHCs were able to perform sputum testing, thus having serious ramifications on the performance of the RNTCP, both for diagnosis as well as follow up of patients.

Even basic amenities like adequate water supply are not available in about a quarter of PHCs. This compares unfavorably with the Rural Health Statistics 2012 Report that reported only about 10% PHCs in the state of Maharashtra functioning without adequate water supply [6].

The study casts aspersions on the ability of the PHCs to provide rational medical care based on sound diagnosis. It is also obvious that non-functioning of the laboratories would come in the way of estimating the load of several diseases in the community, making it difficult to plan effective prevention and control strategies.

The status of dysfunctional PHCs points to administrative deficiencies reflected in the inability of the government to appoint laboratory technicians in the PHCs, as well as ensure the availability of equipment and necessary chemicals.

It is also apparent that the public health system suffers from a lack of governance, both internal as well as external. The inherent issues within the system were highlighted by the CAG Report of 2009 [4]. Strengthening of internal governance mechanisms that include prioritizing supportive services like laboratory services and close supervision is required. This is especially relevant considering the adverse impact dysfunctional laboratories are likely to have on national health programs.

It is also essential that external governance and accountability is improved through existing mechanisms like the institutional *Rogi Kalyan Samitis* (RKS) – Patient Welfare Committees and the Village Health, Sanitation and Nutrition Committees (VHSNCs). These bodies should take up the issues with the public health system and bringing about improvements. The CbMP initiative too is important in this regard.

Conclusion

The present study has highlighted several deficiencies in the functioning of laboratory services at the PHCs in Maharashtra state of India, raising a question mark on the ability of the PHCs to provide quality medical care.

This status of dysfunctional laboratories points to the need for governmental action to address the issues coming in the way of ensuring the availability of basic laboratory services. It also underscores the need for strengthening external governance through community based monitoring processes.

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Appendix

Support for Advocacy and Training to Health Initiatives – www.sathicehat.org

Community Based Monitoring and Planning – www.cbmpmaharashtra.org