

A CROSS SECTIONAL STUDY TO ASSESS THE EXISTING LABORATORY SERVICES IN COMMUNITY HEALTH CENTRES OF TAMILNADU**Sabitha Devi Chandrasekaran¹, Sudharshini Subramaniam^{2*}, Selvavinayagam.T.S³**

1 - Postgraduate in Community Medicine, Institute of Community Medicine, 2 - Assistant Professor, Institute of Community Medicine, Madras Medical College, Chennai. 3 - Director, Institute of Community Medicine, Madras Medical College, Chennai.

Date of Submission : 29-01-2018**Date of online Publication** : 18-04-2018**Date of Acceptance** : 15-03-2018**Date of Print Publication** : 30-06-2018

***Author for correspondence:** Dr. Sudharshini Subramaniam, Assistant Professor, Institute of Community Medicine, Madras Medical College, Chennai-600003. E-mail: sudharshinisubramaniam90@gmail.com

Abstract

BACKGROUND : Community health centres (CHCs), the third tier of network of rural health care institution is required to act primarily as referral centre. The Indian Public Health Standards were framed to measure the effectiveness of the services provided in CHCs in 2007 and were revised in 2012. Laboratory services are crucial in making an appropriate diagnosis and thereby helps in proper management of diseases. **OBJECTIVE:** To assess the existing laboratory services in Community Health Centres in Tamil Nadu and thereby to assess the gaps in comparison with Indian Public Health Standard Guidelines. **METHODOLOGY:** A cross sectional study was conducted in all Community Health Centres of Madurai district and data were collected in terms of available laboratory services by onsite evaluation from October – November 2016, using a standard structured facility Indian Public Health Standard survey format for Community Health Centres. **RESULTS:** Of the recommended, Biochemistry investigations like blood Sugar, blood Urea and serum Cholesterol, Serology investigations were 100% available in all 13 CHCs. It was observed that Urine investigations and a package of basic Antenatal Investigations were 100% available in all the Community Health Centers. **CONCLUSION:** Although the availability of Laboratory Services for Maternal and Child Health care and Non communicable Diseases was 100% available, the availability of investigations for Communicable diseases like smear for Klebsiella and gram stain for throat swab were less compared to IPHS guidelines. Laboratory services are one of the basic determinants of utilisation of health services. So it is mandatory that the Government ensures the adequate readiness and accessibility of Laboratory services.

Key-words: Community Health Centres, Laboratory services, IPHS guidelines

Introduction**“GOOD HEALTH IS THE BEST WEALTH”**

Government of India, keeping in view of the World Health Organisation goal, “HEALTH FOR ALL” by 2000 AD,¹ evolved a national health policy based on primary health care approach. Steps were taken to implement the policy objectives towards achieving the health for all goal. During the last decade further development of rural healthcare infrastructure took place in view to implement National Health policy 2002 and later, National Rural Health Mission with formulation of Indian Public Health Standard guidelines. The mission seeks to provide effective health care to rural population. Towards this end, Indian Public Health Standard guidelines (IPHS) for sub centres, Primary Health Centres, Community Health Centres, Subdistrict and District hospitals were published in January/ February 2007 and have been used as the reference point for public

health infrastructure, and envisaged to improve the quality of health care delivery in the country.

Community Health Centre (CHC), the third tier of network of rural health care institution is required to act primarily as referral centre for patients requiring health services for every 4 PHCs covering 80,000 – 1.2 lakh population.² The National Health Policy 2017 aims at increasing the utilisation of Public Health facilities by 50% from current levels by 2025.³ Facilities like laboratory services is one of the determinants influencing the utilisation of health care services. Laboratory services support the clinical management of diseases in Community Health Centres. A proper diagnosis plays 2 important roles – One, it improves the effectiveness of the treatment and two, it minimises the treatment expenditure by helping in early and prompt diagnosis of the diseases. There are only few documented studies on assessment of laboratory services at Community health centres as per Indian Public Health Standard Guidelines. The present study aims to assess the existing laboratory services in

Community Health Centres and to assess the existing gaps with regard to Indian Public Health Standards guidelines. This study may help in guiding the policy makers to improve the availability of health services offered to rural population and henceforth improve the utilisation of health care facilities.

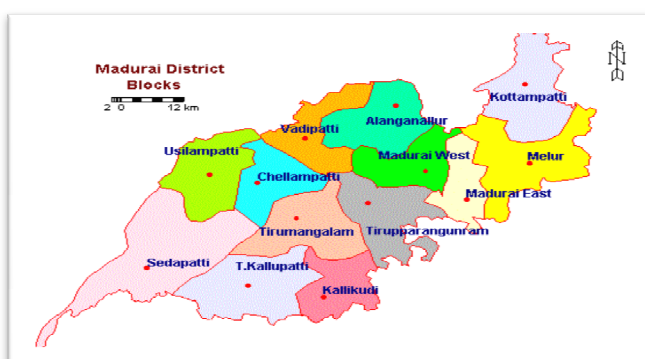
Material & Methods

A cross sectional study was conducted in Tamil Nadu from October 2016 – November 2016. All the 42 Health Unit Divisions in Tamil Nadu were enlisted and out of which one Health Unit Division(Madurai) was chosen by simple random sampling technique. All the Community Health Centres in the selected HUD were assessed for the availability of Laboratory services. On site evaluation of all the CHCs was done and supplemented by interview with the concerned lab technician using a standard structured Indian Public Health Standards Facility survey format. Ethical approval was obtained from Institutional Ethics Committee, Madras Medical College, Chennai. (ECReg.No.ECR/270/Inst./TN/2012) Official permission to conduct the study was obtained from Directorate of Public Health, Chennai and The Deputy Director of Health Services ,Madurai. The Block Medical Officers of the concerned Community Health Centres were explained about the study and permission obtained to conduct the study. The data obtained were entered in Microsoft Excel sheet and analysed using standard statistical techniques. Descriptive statistics was used to analyse the data.

Mapping of Community Health Centres :

The Community Health Centres were located on an average distance of 32kilometres from the nearest referral centre – Government Rajaji Hospital, Madurai Medical College. Tirupparankundram Community Health Centre being the nearest (10 km) and Elumalai Community Health Centre being the farthest,59 km away from the referral centre. (**FIGURE 1**). MANPOWER:A study conducted to assess the existing manpower in community health centres of Madurai HUD revealed that 76.9% (20 out of 26) Lab technicians were available4.In all 13 Community Health Centres 1 regular lab Technician was available and in few Community Health Centres 1 Lab Technician for Integrated Counselling and Testing Center were also available.

Figure 1 MADURAI HUD- Map showing all 13 Community Health Centres of Madurai Health Unit Division and GRH- Government Rajaji Hospital



Box 1: Investigations Recommended By IPHS

CATEGORY	INVESTIGATIONS DONE
Biochemistry Investigations	Blood sugar , Blood urea , serum cholesterol, Liver Function Test, Renal Function Tests.
Haematology Investigations	Haemoglobin estimation, Total Leucocyte Count, Differential Leucocyte Count, Absolute Eosinophil Count, Reticulocyte Count, Total RBC Count, Blood Grouping & Typing, Cross Matching, Peripheral Blood Smear, Peripheral Blood Smear for Malarial parasite& Microfilaria, Platelet Count, Packed Cell Volume.
Pathology & Microbiology Investigations	Sputum cytology, Smear for AFB, Smear for Klebsheilla,Gram stain for throat swab.
Serology Investigations	VDRL,Widal, Urine Gravindex
Cardiac Investigations	ECG
Ophthalmic Investigations	Refraction by Snellen's chart ,Ophthalmoscopy, Retinoscopy.
Radiological Investigations	Ultrasonogram, Dental X-Ray
Urine Analysis	Urine albumin, Sugar, Deposits, acetone, Bile salts , Bile pigments, pH, Specific Gravity.

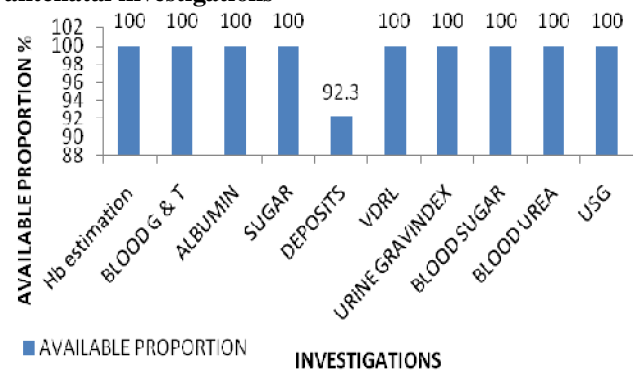
Indian Public Health Standards recommends a set of investigations to be done in Community Health Centres which are enlisted in BOX 1.

Results

Investigations like Hemoglobin estimation, blood smear for malarial parasite and microfilaria, blood grouping & typing Smear for AFB , serology(VDRL, Urine Gravindex, widal) USG , Urine for Albumin and Sugar were 100% available in all the Community Health Centres.

It was observed that a set of basic antenatal investigations recommended in Indian Public Health Standards Facility survey format including Hemoglobin estimation , Blood Grouping & Typing , Urine for - Albumin , Sugar & Deposits , Blood Sugar, Blood Urea and Ultrasonogram were 100% available in all the Community Health Centres.(**FIGURE 2**)

Figure 2 Antenatal Package- the availability of basic antenatal investigations



Investigations like Sputum cytology, Smear for Klebshiella, Gram stain for throat swab,Renal Function Test ,Absolute Eosinophil Count, Reticulocyte count,Total RBC Count, PCV, Ophthalmoscopy ,Retinoscopy were not available in any of the CHCs. X-Ray for spine, chest, abdomen , dental X-Ray , Total

count, Differential count was being done in only 1 out of the 13 CHCs. Hematology investigations like ESR, Platelet count, Cross matching were available in 5 out of 13 CHCs. (TABLE 1)

Table 1 : Results Showing The Available Laboratory Services

INVESTIGATIONS RECOMMENDED BY IPHS	AVAILABILITY OUT OF 13 CHCs	AVAILABILITY (in %)
HEMATOLOGY		
Hemoglobin Estimation	13	100
Total Leucocyte Count	1	7.7
Differential Leucocyte count	1	7.7
Absolute Eosinophil Count	0	0
Reticulocyte count	0	0
Total RBC count	0	0
ESR	5	38.5
Peripheral Blood Smear	2	15.4
PBS for Mp/Mf	13	100
Platelet Count	5	38.5
PCV	0	0
Blood Grouping & Typing	13	100
Cross Matching	6	46.2
BIOCHEMISTRY		
Blood Sugar	13	100
Blood Urea	13	100
LFT	2	15.4
RFT	0	0
Serum Cholesterol	13	100
PATHOLOGY & MICROBIOLOGY		
Sputum cytology	0	0
Smear for AFB	100	100
Smear for KLB	0	0
Gram stain for throat swab	0	0
SEROLOGY		
VDRL	13	100
Urine Gravindex	13	100
Widal	13	100
CARDIAC INVESTIGATIONS		
ECG	13	100
OPHTHALMIC INVESTIGATIONS		
Refraction by Snellen's chart	13	100
Retinoscopy	0	0
Ophthalmoscopy	0	0
RADIOLOGY INVESTIGATIONS		
Ultrasonogram	13	100
Dental X-Ray	1	7.7

Other X-Rays	1	7.7
URINE ANALYSIS		
Urine albumin	13	100
Urine sugar	13	100
Urine deposits	12	92.3
Bile salts, bile pigments	13	100
Acetone	1	7.7
Specific gravity	0	0
pH	0	0

Discussion

According to NFHS 4, the proportion of mothers who had at least 4 antenatal visits in rural Madurai was 71% and the proportion of Institutional births in public facility was 74.9%. The availability of the above mentioned basic antenatal investigations would facilitate the provision of free diagnostics as a part of Janani Shishu Suraksha Karyakram which would therefore reach the needy antenatal women and in turn facilitate more institutional deliveries in Government Health Care Facilities. Also the average out of pocket expenditure per delivery in public health facility in rural Madurai was INR 2752.⁵ The availability of these essential investigations would therefore bring down the expenditure for delivery.

The Situation Analysis of National Health policy 2017 states that there is a growing burden of diseases on account of Non Communicable Diseases. India is experiencing a rapid health transition with a rising burden of Non Communicable Diseases and causing significant mortality & morbidity both in rural & urban population.⁶ The National Program for Prevention and Control of Cancer, Diabetes, Cardio Vascular Diseases and Stroke (NPCDCS) has two components viz. (i) Cancer & (ii) Diabetes, Cardio Vascular Diseases & Stroke. The objectives of the program include Early Diagnosis and Treatment, Surveillance, Monitoring & Evaluation of these diseases.⁶ India has high load of Diabetic cases. Diabetes Mellitus and its complications are to be screened from the grass root level. The availability of investigations like Blood Sugar, Urea, Serum Cholesterol and ECG was 100% in all the Community Health Centres which makes the diagnosis and management of Non Communicable Diseases like Diabetes Mellitus and Cardio Vascular Diseases possible at the Community Health Centre.

HEMATOLOGICAL INVESTIGATIONS :

It was revealed that Haematological investigations like Haemoglobin estimation, Peripheral smear for Malarial parasite & Microfilaria, Blood Grouping & Typing were available in all CHCs (100% available). In India 20% of Maternal Mortality Ratio is due to indirect causes like anaemia, malaria & heart diseases. This makes the management conditions like anaemia and malaria mandatory at the CHC. Peripheral Smear Examination was available in only 2 out of 13 CHCs and Packed cell volume was not available in any of

the CHCs. Mild and Moderate degrees of anaemia can be managed at the level of Community Health Centre itself which requires regular Haemoglobin estimation, Packed cell volume (to assess the efficacy of treatment) and Peripheral Smear Examination (to distinguish the type of anaemia).

Malaria continues to pose a major public health problem in India. In India 21.98% population live in malaria high transmission areas and 67% in low transmission areas.⁷ Under National Vector Borne Disease Control Programme (NVBDCP) disease management including early case detection and complete treatment is one important strategy. Again early Diagnosis and radical treatment is a strategy in the more recent National Framework for Malaria elimination 2016.⁸ The diagnosis of malaria is based on the Microscopic examination of thick and thin smears which is the most accepted method for diagnosis of Malaria with high sensitivity and it also measures the parasite load. It was observed that Peripheral smear for Malarial parasite & Microfilaria was 100% available in all the CHCs.

Total Leucocyte Count and Differential Leucocyte Count are carried out in the investigation of infections, fever, haematological disorders, malignancy, follow up of Chemotherapy and Radiotherapy. Total Leucocyte Count (TLC) & Differential Leucocyte Count (DLC) were available in only 1 CHC (7.7%, n=1). Peripheral Blood Smear can be useful in diagnosing the cause of anaemia, identifying & typing of Leukemia, monitor the effect of Chemotherapy and Radiotherapy. Peripheral Blood Smear (PBS) was available in 2 out of 13 Community Health Centres. The availability of these investigations can be helpful for monitoring patients on Chemotherapy and radiotherapy in CHCs itself even though they are taking treatment for Malignancies in tertiary care centres.

In India, the risk of Dengue has shown an increase in recent years. Dengue is endemic in 35 states. During 2014, about 40425 cases were reported with 137 deaths.² Tamil Nadu is also one among the states with highest number of cases. Quick and precise dengue diagnosis is of a principal importance for clinical management; The management of the disease is essentially symptomatic with monitoring of platelet count and Packed Cell Volume (Haematocrit). Platelet Count was done in only 5 out of 13 CHCs and Packed Cell Volume was not available in any of the facilities. (TABLE 1) This makes unnecessary and unwanted referral of cases of Dengue to next level of referral centre for the sake of these investigations.

SEROLOGICAL INVESTIGATIONS: Urine gravindex, Widal & VDRL tests were 100% available. Widal availability is useful mainly in typhoid endemic areas and makes the control of the disease possible.

RADIOLOGICAL INVESTIGATIONS:

Ultra sonogram, X-Ray for chest, skull, bone, spine, abdomen, Dental X-Ray is to be done in CHCs according to IPHS guidelines. Ultra sonogram was 100% available in all CHCs. X-rays were available in only 1 CHC out of

13. A simple X-Ray for Bone fracture when not available consumes the time, money of the patient and also puts the patient to mental stress.

MICROBIOLOGY & PATHOLOGY INVESTIGATIONS :

Of the Microbiology and Pathology investigations mentioned in the Indian Public Health Standards Facility survey format sputum cytology, Smear for Klebsiella, Gram stain for Throat swab were not available at all. It was revealed that Sputum for AFB was 100% available in all 13 Community Health Centres. India has the highest burden of Tuberculosis in terms of number of incident cases each year. In 2014, 3,43,032 cases of pulmonary Tuberculosis were diagnosed in India.^{2,9} This high burden warrants the diagnosis, management & followup of the disease crucial. RNTCP has percolated through the public health care facilities and sputum for AFB availability being 100% adding to the effectiveness of the program.

A study conducted in Primary Health Centres and Community Health Centres of Madhya Pradesh showed that the availability of laboratory based tests were negligible at PHCs, and low at CHCs¹⁰ and compared to that study the Community Health Centres in Madurai are in a better position in respect to functioning of laboratories. Another study conducted in Northern Kashmir revealed that out of 16 PHCs, 15 had laboratory facilities, ECG services were available at five PHCs (31.25%) had availability of ECG facility, while only 3 (13.7%) had ultrasonography facility.¹¹ Padalkar et al study reveals that out of total 123 Primary Health Centres only 9.7% (n=12) of the Laboratories were found to be functional.¹²

Also to avoid patient referral for the sake of investigations, Hub & Spoke MODEL can be used in which the samples collected from the patients can be transported to the nearby District hospitals/ Medical college Hospitals and the reports despatched back to the concerned CHCs thereby minimising patients time and money. A study conducted in UK demonstrated that hub & spoke model for laboratory diagnostic testing can improve the timeliness and predictability of delivery of results to clinicians.¹³

CONCLUSION: Community Health Centres are principally required to act as referral centre. The study identified that most of the basic investigations for antenatal women including Hemoglobin estimation, Blood Grouping & Typing, Urine for - Albumin, Sugar & Deposits, Blood Sugar, Blood Urea, ECG and Ultrasonogram were fully functional. Investigations like Blood Sugar, Blood urea, Urine Sugar, Serum Cholesterol, ECG for management of Non communicable Diseases were available. Most of the Hematological Investigations (except haemoglobin estimation and peripheral smear for malaria), sputum cytology, gram stain for throat swab, smear for Klebsiella were not functional in most CHCs which shows that Community Health Centres in Madurai are lagging behind in managing Communicable Diseases. Similarly Dental X-

Ray and X-Ray for Chest, skull, abdomen & spine were available only in 1 CHC which projects the gap in managing cases requiring X-Rays like tooth extraction, Fractures etc .So when attempts are made to fulfil the gaps, CHC would definitely be transformed into a comprehensive universal health care provider.

LIMITATIONS: The study has assessed only the availability of Laboratories services by the investigations being done and not quality of services available. Hence just availability may not always translate into functionality.

RECOMMENDATIONS

One suggestion would be to tie up with nearby private laboratories for investigations like urine ketones, platelet count, X-Rays which are mandatory investigations.

References

1. Welfare F. Guidelines for Community Health Centres Guidelines for Community Health Centres Internet 2012; Available from : <http://health.bih.nic.in/docs/guidelines/guidelines-community-health-centres.pdf>
2. Park JE. Park's Textbook of Preventive and Social Medicine.24thed. Jabalpur, India: M/s Banarsidas Bhanot Publisherst;2017.976 p.
3. Ministry of Health and Family welfare (India).National Healthy Policy , 2017.
4. A.Chitra, S.Kaleeswaran, S.Sudharshini . A cross sectional study to assess the existing manpower in community health centres in a district of TamilnaduNational Journal of Research in Community Medicine. Vol.6. Issue 3. Jul.-Sep.-2017(263-266)
5. Ministry of Health and Family welfare (India). National Family Health Survey - 4 District Fact Sheet Madurai Tamil Nadu. 2015.
6. Directorate General of Health Services Ministry of Health & Family welfare Government Of India.National Programme For Prevention AND Control Of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS) Operational Guidelines:1-66.2010
7. WHO (2016), Fact Sheet on World Malaria Report, April ;2016.
8. National Framework For Malaria Elimination In India (2016-2030), Directorate Of National Vector Borne Disease Control Programme (NVBDCP) Directorate General Of Health Services (DGHS) Ministry Of Health & Family Welfare Government Of India 2016-2030
9. WHO (2016), Global Tuberculosis Report 2016
10. Abhijit Pakhare, Sanjeev Kumar, Swati Goyal and Rajnish Joshi. Assessment of primary care facilities for cardiovascular disease preparedness in Madhya Pradesh, India. BMC Health Services Research (2015) 15:408;1-8.
11. Jan R, Khatana GH, Salim SM, Jeelani W.

- Assessment of services at Primary Health Centres of Northern Kashmir as per Indian Public Health Standards. Sch. J. App. Med. Sci., December 2015; 3(9C):3342-3344
12. Devane-padalkar A, Deshpande S, Yakkundi D. Laboratory Services at Primary Health Centers under the Lens: A Need for Overhaul. 2016;IJTDH, 13(4): 1- 6
 13. David James and Derek Truman . Improvement in laboratory test turnaround times for inpatients following move to hub and spoke model of delivery. Practical Laboratory Medicine 1 (2015) 2-4. Available from <http://dx.doi.org/10.1016/j.plabm.2015.02.002>

Conflict of Interest: None

Source of funding support: Nil

How to cite this article: Sabitha Devi Chandrasekaran, Sudharshini Subramaniam, Selvavinayagam.T.S.A Cross Sectional Study To Assess The Existing Laboratory Services In community Health Centres Of Tamilnadu. Nat J Res Community Med 2018;7(2):129-133.

© Community Medicine Faculties Association-2018
 NJRCM: www.commedjournal.in

