

Rethinking Primary Health Centers (PHCs): Designing for the post pandemic era.

Rethinking Primary Health Centers (PHCs): Designing for the post pandemic era

Md Haseen Akhtar¹, Janakarajan Ramkumar²

1- Prime Minister Research Fellow, Department of Design, Indian Institute of Technology, Kanpur, India.

email: mdhaseendw20@iitk.ac.in

2- Professor, Department of Design, Indian Institute of Technology, Kanpur, India.

email: jrkmumar@iitk.ac.in

ABSTRACT

Thinking Shift Alert: “Thinking out of the box” to “Thinking around the box”. COVID-19 pandemic was a painful lesson for all. When it started to take control over the healthcare infrastructure in quick time, all we managed was to provide needed care to the population. The conventional healthcare infrastructure had a set back with restricted capacity to treat patients. The surge of incoming patients was one of its kind which led to innovative emergency approaches to cope with the situation at hand. Repurposing old structures, erecting temporary structures, establishing mobile hospitals and many more grass root innovations were surfaced and implemented worldwide. Although, Primary Health Centers (PHCs) were used for testing and vaccination, it was not utilized to its full potential due to several reasons.

Primary Health Centers (PHCs) were utilized to its maximum capacity for testing and vaccination. The PHCs inaccessibility due to its remote location, less awareness among the community and various other reasons led to less testing and vaccination of the population resulting in underutilization of PHCs and invasion of deadly virus into the deepest of the societies. This study explores problems related to the underutilization of PHCs through a study in rural areas around Kanpur. We visited PHCs in Kanpur and interviewed the medical officers to find problems associated with its underutilization and to draw insights to brainstorm ideas about innovative ways to improve. One of the findings from the field study is that this problem needs an interdisciplinary attention of experts. Finally, we established that the concept of making the Primary Health Centers (PHC), a mobile infrastructure, will certainly remove most, if not all, the existing problem and has a potential to emerge as a new healthcare delivery model to provide basic healthcare services to the intended users.

Keywords: primary healthcenter, modular design, future thinking, forecasting skills, plug and play design, future primary healthcare design, emergency innovation, COVID-19

RESUMEN

Alerta de cambio de pensamiento: "Pensando fuera de la caja" a "Pensando alrededor de la caja". La pandemia de COVID-19 fue una lección dolorosa para todos. Cuando comenzó a tomar el control de la infraestructura de salud en poco tiempo, lo único que logramos fue brindar la atención necesaria a la población. La infraestructura de salud convencional tuvo un retroceso con capacidad restringida para tratar pacientes. El aumento de pacientes entrantes fue único en su tipo, lo que condujo a enfoques de emergencia innovadores para hacer frente a la situación actual. La reutilización de estructuras antiguas, la construcción de estructuras temporales, el establecimiento de hospitales móviles y muchas más innovaciones de base surgieron e implementaron en todo el mundo. Aunque los Centros de Salud Primaria (PHC, por sus siglas en inglés) se utilizaron para pruebas y vacunas, no se utilizaron en todo su potencial debido a varias razones.

Los Centros Primarios de Salud (PHC) se utilizaron al máximo de su capacidad para realizar pruebas y vacunación. La inaccesibilidad de los PHC debido a su ubicación remota, la menor conciencia entre la comunidad y varias otras razones llevaron a menos pruebas y vacunación de la población, lo que resultó en la subutilización de los PHC y la invasión de virus mortales en lo más profundo de las sociedades. Este estudio explora los problemas relacionados con la subutilización de los PHC a través de un estudio en áreas rurales alrededor de Kanpur. Visitamos los PHC en Kanpur y entrevistamos a los funcionarios médicos para encontrar problemas asociados con su subutilización y extraer ideas para intercambiar ideas sobre formas innovadoras de mejorar. Uno de los hallazgos del estudio de campo es que este problema necesita una atención interdisciplinaria de expertos. Finalmente, establecimos que el concepto de hacer de los Centros Primarios de Salud (APS), una infraestructura móvil, ciertamente eliminará la mayoría, si no todos, el problema existente y tiene el potencial de emerger como un nuevo modelo de prestación de atención médica para brindar servicios básicos de atención médica a los usuarios previstos.

Palabras clave: centro de salud primario, diseño modular, pensamiento futuro, habilidades de pronóstico, diseño plug and play, diseño futuro de atención primaria de salud, innovación de emergencia, COVID-19

INTRODUCTION

More and Job (2020) reported that continuity of care for all patients is ensured via strong primary and community health care. Strong primary health care delivers regular, preventive, and patient-focused treatment and creates longitudinal patient-care provider connections, rather than only providing episodic care and responding to acute health concerns. It also acts as a convenient entrance point into the health-care system. These services are necessary to guarantee that people's worries, anxieties, and needs are heard, and that any health issues are addressed as soon as possible (More & Job, 2020). World Health Organization (WHO) in their article "Primary care's role in the Covid-19 response" mentioned that the global response to coronavirus disease started with primary care. Primary care had an important function in clinical outcomes and gatekeeping, such as recognizing and COVID-19

cases that need to be triaged, establishing an early diagnosis, assisting vulnerable persons in coping with their fear of the virus, and lowering the need for hospital services during Covid-19 pandemic. As cities enforced rigorous control measures, including non-pharmaceutical therapies, and as major hospitals closed their outpatient clinics during periods of high transmission, primary care has become increasingly crucial. In communities with a robust primary care system, there is also an increasing role for home care for COVID19 cases, which enhances the trust between health-care personnel and communities(Pacific, n.d.).

Kumar (2021) reported that identifying and managing potential cases was a crucial function for Primary Health Centers (PHCs) during the Covid-19 pandemic. The important aspects of under-identification and possible case management are identified and triage, isolate, assess, and advise. In India, COVID-19 Micro Plan for controlling localized spread of coronavirus disease had explicitly outlined the role of community health professionals conduct screenings in people's homes, and if verified, contact tracing, quarantine, and isolation at the primary care level. The function of the primary health infrastructure in terms of general classification and prospective case management was also outlined. The Primary Care apparatus included 1007045 ASHAs, 2543113 Anganwadis, and 832445 Ayush Medical officers. Furthermore, 927000 MBBS medical officers participate in the COVID 19 response, with most medical officers belonging to the system of primary care. In India, the primary care system has played a critical role in the provision of COVID 19 immunization services. The role of primary health care in Covid 19 vaccination was well stated in the Government of India operational guideline for COVID 19 Vaccines. Because vaccination is a difficult issue in many groups, Indian government had also devised a Covid 19 vaccine communication strategy(Kumar, 2021). Despite of all the policy framework outlined, there were shortcomings on the part of execution due to lack of workforce, infrastructure, and flexibility in action plan to show resistance against the unprecedented frailties from Covid-19.

For those living in remote and hard-to-reach locations, primary health care is comprehensive treatment that includes a wide range of critical services. However, India's basic healthcare delivery system is still in its infancy, with a scarcity of human resources(Vyas et al., 2021). Two activities were of prime importance during the pandemic, fast testing, and vaccination of population. Lack in both these activities were the reason of virus invading deep into the community and mutate giving birth to more serious and uncertain problems that the world is still struggling. Though, Primary Health Centers (PHCs) were used for testing and vaccination, it was not utilized to its full potential due to several reasons. Thus, the article intends to explore the lacunae in terms of infrastructure, services, and unknown factors resulting to inaccessibility and underutilization of PHCs in Indian context.

MATERIALS AND METHODS

The main question which is addressed in this study is: What are the factors responsible for PHCs underutilization? How a mobile PHC will help in tackling the wide range of factors of existing PHCs? Is the mobile Primary Health Center, the way forward to provide key healthcare services to the underserved population?

To answer the above prime questions, this study explores possible design ideas of future primary health center. We used qualitative interview method to investigate about current scenario pertaining to the infrastructure, facilities, and services in existing PHCs taking Kanpur as the target location for the study. The other method used was Futures Thinking technique developed by Jane McGonigal, a research director at the Institute of Futures, Palo Alto, California, USA. Ideas were brainstormed with focus groups around the concept of making the Primary Health Centers (PHCs), a mobile infrastructure. It is therefore the need of the hour to forecast the future primary health in terms of infrastructure and workforce to be able to adapt better in future against natural catastrophe.

The first method employed was that of an open-ended qualitative interview to extract insights. The SUTD - MIT (Figure 1) interview template was used which is developed for product-service-system (PSS). It is done in two phases where the author has visited 6 PHCs in the first phase and 7 PHCs in the second phase. The Medical Officers at the PHCs were interviewed and were asked about the facilities and services provided by their PHC and what are the improvements areas.

Interview Template			
Who Name: Age: Gender: Occupation:	Likes e.g. personal preferences	Dislikes e.g. on particular concerns	Quotes e.g. the main key-points
When & Where Location: Date: Time:			
Key Findings: (Latent Needs, Insights, Foresights) <ul style="list-style-type: none"> • _____ • _____ • _____ • _____ • _____ • _____ 	Activities e.g. daily routines	Suggestions e.g. any other ideas	Environment e.g. virtual or physical

Fig 1. SUTD-MIT interview template for PSS (Product-Service System)

RESULTS AND DISCUSSION

The 13 interviews were taken with the medical officers of each PHC. The first question was about the services provided, staff details, and the facilities available. Then the next question was to narrate a typical day at the PHC with all the different activities performed. The prime question asked was: What do you like about the overall system of treating patients at your PHC with a follow up of dislikes for the same? Lastly the medical officers were asked to give suggestions on how to improve the present situation (if any). If there are quotes mentioned by the medical officer in between the interview at any point is noted. Author self-observation is also noted in terms of the

cleanliness and hygiene of the place overall. Insights were gathered based on the responses provided by the medical officers to inform design decisions and to develop problem identification. During visit I, author visited 6 PHCs in and around Kanpur city within a radius of 10 kms. During visit II, author visited 7 PHCs in and around Kanpur city within a radius of 20 kms. The PHCs were randomly selected based on the availability of medical officer at the time of visit to a particular PHC (Primary Health Center).

The following table summarizes the direct and latent needs, insights, and foresights. Key issues were synthesized, and solutions were proposed.

Table 1: Direct and Latent needs/Insights and foresights - Authors Own

	Direct and Latent Needs	Insights and Foresights
Visit I	<ol style="list-style-type: none"> 1. The PHC is not well maintained and equipped with facilities. 2. Facilities at most of the PHCs are underutilized. 3. PHC location is inaccessible by the intended user. 4. Lack of Staff 5. PHCs are not well recognized. 6. It is being utilized by high class society than the target user. 7. Lack of space for conducting the required activities. 	<ol style="list-style-type: none"> 1. There should be a separate PHC for conducting NHPs. 2. PHC should be in accessible and reachable location.
Visit II	<ol style="list-style-type: none"> 1. Disbalance between infra-structure, services to be provided and workforce. 2. Doctors are busy in other admin work rather than core clinical work. 3. Lack of maintenance and water supply. 	<ol style="list-style-type: none"> 1. The location should be clean and welcoming. 2. The location should be easily reachable. 3. PHC should be in self-owned government building. 4. Weekly camps, NHPs and other monthly activities should be in a separate PHC. 5. Camps are important for awareness among the people. 6. There should be a breast-feeding cubicle in the OPD area.
Key issue synthesized	Form both the visit, the PHCs in Kanpur needs urgent attention on the part of policy makers, health professionals and designers to work closely for a collaborative innovation.	The insights gathered points out to a very important intervention of reducing the load of conducting a lot of activities, camps, and programs on each PHC. This can be achieved by having separate PHCs responsible for conducting separate activities.

The above reported direct and latent needs from the qualitative interviews shows that the PHCs in Kanpur needs improvement in all dimensions, from workforce to infrastructure availability. This issue has already been raised at the higher-level authority but hardly any changes or actions takes place. If at all, changes take place, then due to lack of maintenance, the infrastructure becomes unusable and due to lack of commitment, workforce

becomes laid back to the service. Thus, there is a need of disruptive change in the entire infrastructure and thus idea of making the PHC mobile is proposed. Thus, this idea, if implemented can entirely change the overall healthcare system towards a more efficient delivery model.

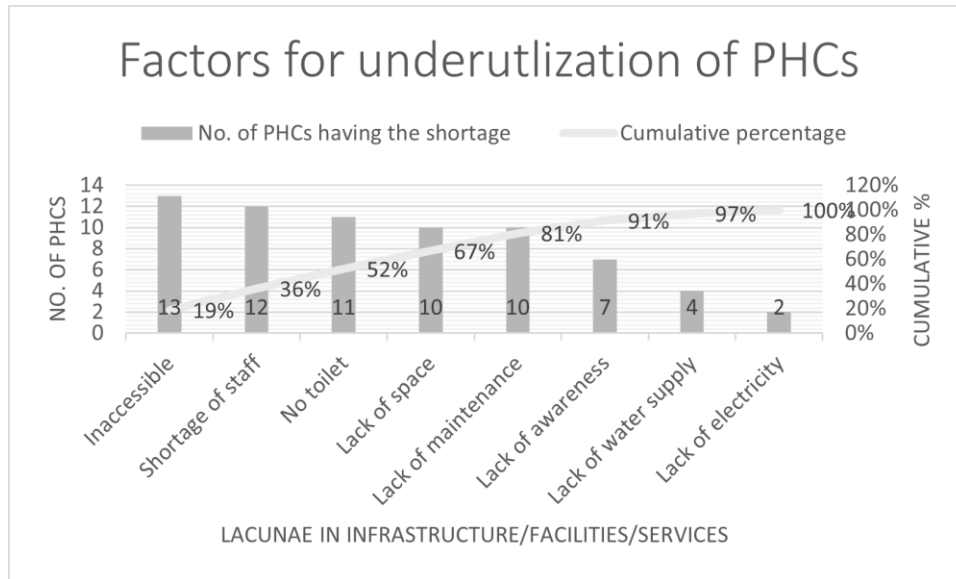


Fig. 2. Pareto Chart showing factors for underutilization of PHCs - Authors Own

The second method employed was to quantitatively map the factors responsible for the underutilization of PHCs on a Pareto chart. A Pareto chart works on the principal of 80:20 rule. It indicates those 20% factors which will resolve 80% of the issues. The above graph represents the factors responsible for the underutilization of PHCs in Kanpur (Figure 2). The graph indicates those 20% factors which will resolve 80% of the overall issue in PHCs of Kanpur. Here in this case, those 20% factors which must be addressed are the inaccessibility, shortage of staff, lack of toilet, space, and infrastructure in PHCs which will help in resolving 80% of the overall PHCs issue. Resolving these factors will help in better utilization of PHCs and thus making the Primary Health Centers (PHCs) more efficient.

The second method employed was Futures Thinking Technique. Let's take the lack of staff in PHCs. A mobile unit will need a minimum of 4 staff which is less than the requirement of a conventional PHC. PHCs in Kanpur are reported to be unreachable. Thus, deploying the mobile unit to a location known to the nearby population such as primary schools, open grounds, marketplace of the nearby village(s). These PHCs are also not well recognized which raises the issue of its underutilization. To resolve this issue, mobile modules can also serve to do advertisement through awareness camps which will help the modular unit to be recognized by the intended user and thus will help in efficient utilization. Each PHC is loaded with responsibilities to be fulfilled, and by one medical officer which restricts them to perform their core clinical work to potential. This can be resolved by decentralizing different activities such as OPD and referral, immunization camps, National Health Programs (NHPs) in separate modular units will help in reducing the burden on medical officer(s). Lack of electricity and water supply issue can be resolved by

deploying the system, for example inside the premise of a primary school and having a separate dedicated facility to provide electricity, a setup to provide water supply by plug and play mechanism and a toilet area for the staff.

CONCLUSION

The important findings from the above field visit to PHCs in Kanpur are as follows:

- a) The 13 PHCs in Kanpur lacks the required infrastructure thus underserving the intended population.
- b) 90% of these PHCs lacks the minimum workforce to cater to the patients.
- c) The services provided by these PHCs are more in quantity but lacks the required quality of care.
- d) One of the important findings of this study is that there is a lack of commitment from the workforce which is somehow pinning down the other side of these PHCs performance.
- e) The most common lacuna of these PHCs being underutilized is their location inaccessibility.

Thus, it is concluded that there is an immediate need of equipping the Primary Health Centers (PHCs) with required infrastructure and workforce to cater the basic healthcare services to the intended user. The future of primary healthcare delivery model must be visioned as a mobile modular unit, either as a custom-made vehicle, or retrofitted on an existing vehicle, or an entirely collapsible system which can be carried to the remotest of the location with minimum resources for maximum reach.

“Future is already here; it’s just not deeply imagined of” - Author

ACKNOWLEDGEMENTS

The authors are thankful to PMRF Scheme, which is under Ministry of Education (MoE), Government of India (GoI), and MedTech IIT Kanpur for the guidance on this research; and to the National Biopharma Mission (NBM) of the Department of Biotechnology India, being executed by the Biotechnology Industry Research Assistance Council (BIRAC), for providing the funds under Proposal No. BT/NBM0127/03/18.

REFERENCES

- Kumar, S. (2021). Understanding the role of Primary Care in Covid 19 response In India - Your Say. *Plos Blogs*, 1–10.
<https://yoursay.plos.org/2021/05/13/understanding-the-role-of-primary-care-in-covid-19-response-in-india/>
- More, D. P., & Job, N. (2020). *OECD Home About 2 Countries*. May, 1–36.
- Pacific, W. H. O. R. O. for the W. (n.d.). *Role of primary care in the COVID-19 response*. WHO Regional Office for the

Sustainability, Agri, Food and Environmental Research, (ISSN: 0719-3726), vol 12(2), 2024
<http://dx.doi.org/10.7770/safer-V13N1-art647>

Western Pacific. <http://iris.wpro.who.int/handle/10665.1/14510>

Vyas, S., Sharma, N., Archisman, Roy, P., & Kumar, R. (2021). Repercussions of lockdown on primary health care in India during COVID 19. *Journal of Family Medicine and Primary Care*, 10(7).
https://journals.lww.com/jfmipc/Fulltext/2021/10070/Repercussions_of_lockdown_on_primary_health_care.2.aspx

Received: 14th October 2022; Accepted: 31th January 2023; First distribution: 26th April 2023.