


# BMJ Open Quality Role of mixed healthcare providers networks in strengthening primary care systems: a case study of a rural primary care site

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## ABSTRACT

**Introduction** Service delivery networks, also called healthcare providers networks (HCPNs) have been used to address health inequities and promote universal healthcare (UHC). This study described the effect of instituting a mixed HCPN (partnership of public health facilities with a private pharmacy) on the provision of medications in the rural primary care pilot site of the Philippine Primary Care Studies (PPCS).

**Methods** This is a case study of the mixed HCPN in the PPCS rural site. A mixed HCPN involving one private pharmacy was instituted to increase the supply of drugs. The total number of medications prescribed per month from April 2019 to October 2021, and the number of medications dispensed from the public sector (rural health unit or RHU) and from the partner private pharmacy in the same time period were obtained.

**Results** Of the 101 031 medications prescribed in the first year (April 2019 to March 2020), 21.7% were dispensed at the RHU and 66.7% were dispensed in the partner private pharmacy. The remaining 11.5% were unrendered or dispensed in other private pharmacies. Of the 35 408 medications prescribed in the second year (April 2020 to March 2021), 5.6% were dispensed at the RHU and 32.2% were dispensed at the partner private pharmacy. Majority (62.1%) were unrendered or dispensed in other private pharmacies. From April to October 2021, of the 6448 medications prescribed, 2.3% were dispensed at the RHU, and 47.3% were dispensed at the partner private pharmacy. Majority (50.3%) were unrendered or dispensed in other private pharmacies.

**Conclusion** Creation of a mixed HCPN in a rural primary care site augmented access to essential medications. The mixed HCPN model in the study showed potential in strengthening access to consultations and medications in a rural community. Improving essential primary care services can facilitate implementation of UHC in the Philippines.

## INTRODUCTION

A strong primary healthcare system is considered a cornerstone for the successful and sustainable implementation of universal health coverage.<sup>1</sup> In the Philippines, the universal healthcare (UHC) Act (Republic

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ International literature reports the critical role of mixed healthcare providers networks (HCPNs) in facilitating universal access to essential drugs and health services.
- ⇒ Primary care services in the Philippines are provided mostly by municipal governments, and there are many obstacles in the procurement of medications at the local government unit level.

## WHAT THIS STUDY ADDS

- ⇒ This study described the impact of instituting a mixed HCPN with a private pharmacy on the primary care system in the rural pilot site in the Philippines.
- ⇒ Creation of a mixed HCPN in a rural primary care site augmented access to essential medications.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Mixed HCPNs show potential in strengthening primary care services to facilitate implementation of universal healthcare in the Philippines.

Act (RA) No. 11223) was signed into law in 2019. This legislation mandates the inclusion of all Filipino citizens in the National Health Insurance Programme, guaranteeing access to a range of preventive, promotive, curative, rehabilitative and palliative healthcare services.<sup>2</sup>

Primary care services in the Philippines are provided mostly by municipal governments through the rural health units (RHUs) and barangay health stations (BHS). Although significant improvements have been achieved in the Philippine health system, there are still important issues that need to be addressed. Health inequities, health system inefficiencies, fragmented health financing and pluralistic service delivery are some of the most important challenges facing the Philippine health system.<sup>3</sup>

In the Philippines, the service delivery networks of hospitals, clinics, laboratories, pharmacies and other facilities are also known as healthcare provider networks (HCPNs). These networks may be composed exclusively of public facilities in some local government units (LGUs), which are public HCPNs. Inclusion of private facilities, called mixed HCPNs, are also allowed under RA 11223. The main advantage of mixed HCPNs is improvement of service delivery through availability of more human and financial resources, higher operational efficiency and potentially, lower cost because of economies of scale. For this reason, the Department of Health of the Philippines issued an administrative order in 2010 encouraging LGUs to pursue mixed HCPNs to supplement services that cannot be adequately provided by the public sector.<sup>4</sup>

The Philippine Primary Care Studies (PPCS) aimed to evaluate the effectiveness of various interventions in strengthening the Philippine primary care systems, with an ultimate goal of successfully implementing UHC in the Philippines. The interventions were implemented in three pilot sites—an urban site, a rural site, and a remote site. Interventions included: (1) provision of a primary care benefit package covering outpatient consultation services, laboratory tests, diagnostic procedures and medicine, (2) development of an electronic health record (EHR) system, (3) augmentation of human resources for health through hiring of additional physicians and providing training for healthcare providers to enhance quality of care, (4) provision of performance-based financial incentives for healthcare workers, (5) community preparation for primary care services and (6) establishing mixed HCPNs. In the rural site, one private laboratory and one private pharmacy were included in the mixed HCPN. The partner private pharmacy was provided financial compensation for the drugs they dispensed. No other compensation was provided apart from this.

This study described the effect of instituting a mixed HCPN on the provision of medications in the rural primary care pilot site of the PPCS. Specifically, this study aimed to (1) determine the proportion of medications dispensed to patients by the private pharmacy in the mixed HCPN in the rural site and (2) determine the proportion of prescriptions not dispensed in either the RHU or the partner private pharmacy.

## METHODOLOGY

### Study design

This is a case study of a mixed HCPN in the pilot rural primary care site of the PPCS programme. We chose a case study to illustrate the experience of the rural site with a mixed HCPN and show how this affected its primary care system delivery. Through this case study, we demonstrate the role of mixed HCPNs in strengthening primary care systems in the Philippines, particularly in areas with similar socioeconomic conditions.

### Study site

The rural pilot site of the PPCS is Samal, a fourth-class municipality in the province of Bataan, Philippines. It has a population of 35 302 people, divided into 14 barangays.<sup>5</sup> Primary care is delivered through one RHU (under one municipal health officer) and 14 BHS. There are no private clinics in the municipality.

PPCS interventions were implemented in the rural site in April 2019. A mixed HCPN with one private pharmacy was instituted to increase the supply of drugs. This was done in anticipation of the increased demand for medications as a result of the various PPCS interventions. The private pharmacy was chosen due to its capacity to provide the needed drugs and its willingness to be part of the mixed HCPN. The EHR system was implemented across the HCPN, unifying patient records in the RHU, BHS, laboratories, pharmacies and accounting services.

Funding for the interventions was obtained from PhilHealth. Full funding was available for the first year of implementation (April 2019 to March 2020). By the second year (April 2020 to March 2021), there were some residual funds which were erratically available. By the third year of implementation (April 2021), there was no more additional funding. The residual funds were completely used by October 2021. The partner private pharmacy was paid for drugs they dispensed to patients as monitored in the EHR system.

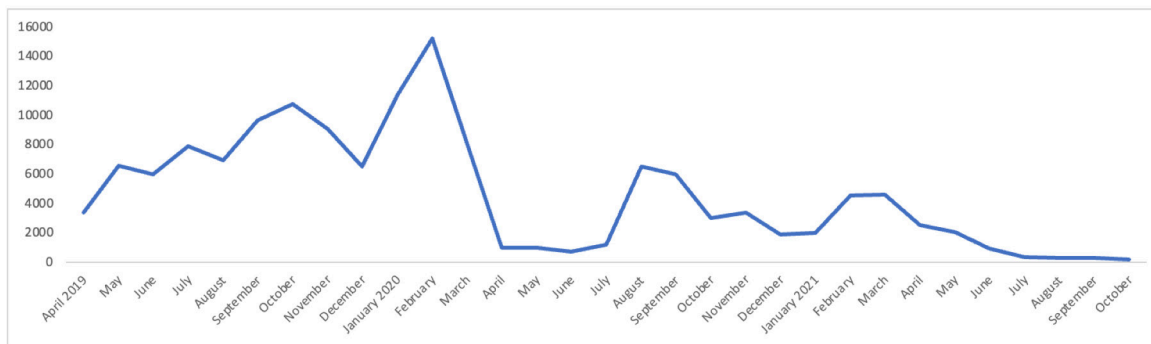
### Data collection methods and sampling

Total enumeration was done for this study. Prescriptions were encoded by the primary care providers in the RHU or BHS for each patient encounter that needed medications. The total number of medications prescribed per month from April 2019 to October 2021 was obtained by one coinvestigator from the EHR system. Each type of medication was counted as one unit (ie, one patient prescription with two lines of medications would generate a count of 2, regardless of the number of tablets prescribed).

The medications dispensed in the RHU or partner private pharmacy was recorded in the EHR by the pharmacist. The number of medications dispensed from the public sector (RHU) and from the partner private pharmacy in the same time period were generated from the EHR system and obtained by the same coinvestigator. Data was examined for completeness and processed using MS Excel.

### Data analysis

Descriptive statistics was used. The number of medications prescribed were presented using means and SD. The proportion of medications dispensed in the RHU and in the partner private pharmacy were presented using frequencies and percentages. Appropriate graphs were created to demonstrate the data trends through time using MS Excel.



**Figure 1** Number of medications prescribed per month.

## RESULTS

During the entire study period, 142 887 medications were prescribed. In the first year of implementation (April 2019 to March 2020), there were 101 031 medications prescribed, with a monthly average of 8419.3 (SD 3064.7). In the second year (April 2020 to March 2021), there were 35 408 medications prescribed, with a monthly average of 2950.7 (SD 2029.0). From April to October 2021, only 6448 medications were prescribed, with a monthly average of 921.1 (SD 960.6). The number of medications prescribed per month is shown in [figure 1](#).

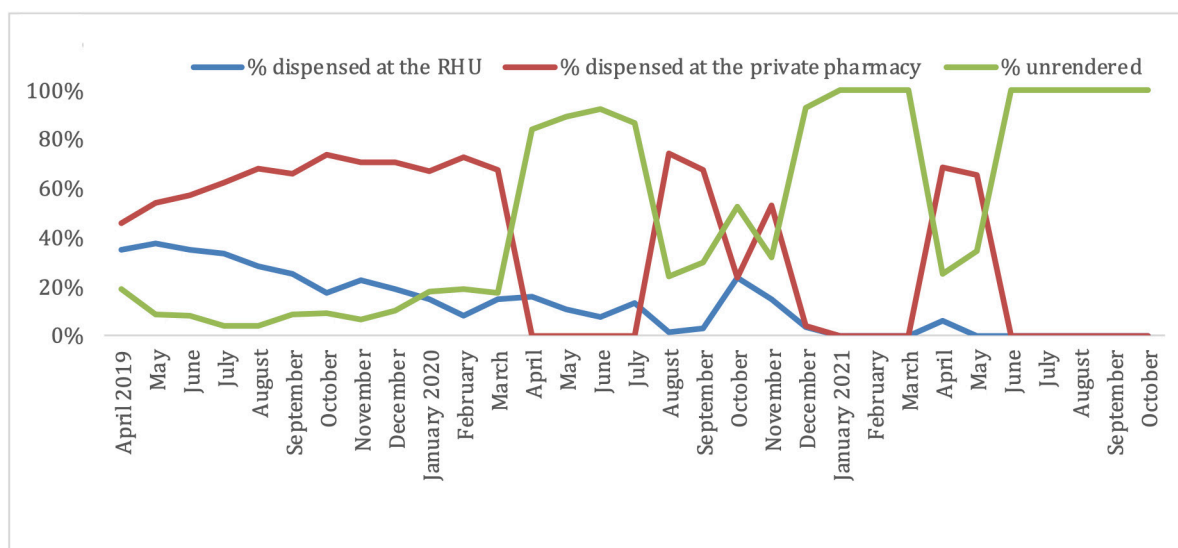
As shown in [figure 1](#), there was a sharp decline in the number of prescriptions from April to June 2020. These months corresponded to the onset of the COVID-19 pandemic in the Philippines. There was again a steady decline in medication prescription noted from April 2021 onwards, when primary funding was already depleted.

Of the 101 031 medications prescribed in the first year, 21 970 (21.7%) were dispensed at the RHU and 67 403 (66.7%) were dispensed in the partner private pharmacy. The remaining 11 658 (11.5%) were not dispensed at the RHU nor at the partner private pharmacy. These could have been purchased in other private pharmacies, or the patients may have decided not to take the medication. Of

the 35 408 medications prescribed in the second year, 2000 (5.6%) were dispensed at the RHU and 11 403 (32.2%) were dispensed at the partner private pharmacy. Majority (22 005 or 62.1%) were purchased in other private pharmacies or not taken. From April to October 2021, of the 6448 medications prescribed, 148 (2.3%) were dispensed at the RHU, 3052 (47.3%) were dispensed at the partner private pharmacy and 3248 (50.3%) were purchased in other private pharmacies or not taken. The proportions of medications dispensed per site and unrendered per month are shown in [figure 2](#).

## DISCUSSION

This study demonstrated the important role of a mixed HCPN in the provision of primary care in a rural site in the Philippines. During the study period, because of primary care funding, there was an observed increase in demand for medications, reflected by the increase in number of medication prescriptions. Despite the increase in demand, the number of medications dispensed at the RHU remained consistently low in volume with minimal variation. The partner private pharmacy was responsive to this demand with an increase in medications dispensed,



**Figure 2** Proportion of medications dispensed in the rural health unit, private pharmacy, and unrendered per month from April 2019 to October 2021. RHU, rural health unit.



thus providing patients access to their needed medications.

This finding is consistent with international literature citing the critical role of mixed HCPNs in facilitating universal access to essential drugs and health services.<sup>1 6</sup> Based on a 2020 review of mixed HCPNs in primary healthcare, the main advantages include improved access to diagnostic and treatment services, improved equity due to availability of essential medicines and services for vulnerable populations, relief of overburdened public resources, increased efficiency and less waiting time for patients. The identified disadvantages of mixed HCPNs from the review included failure to harmonise public-private health information systems, bureaucratic processes leading to extra work in implementing the partnership, increased monitoring and administration cost, and funding challenges.<sup>6</sup>

In our experience with the rural site of the PPCS, the advantage of a mixed HCPN in improving access to essential medicines was very prominent. Despite the increase in patient demand, the number of drugs dispensed from the RHU pharmacy remained consistently low. Limited availability of drugs at the RHU pharmacy may be a possible reason for this, with the RHU pharmacy only able to cater to the needs of the same number of patients each month. In contrast, the private pharmacy was more responsive and were able to increase the number of medications dispensed to meet the increased demand. This highlights how a mixed HCPN alleviated the supply gaps.

In the Philippines, procurement of medications at the LGU level faces many obstacles. The LGU needs to estimate how much medications will be dispensed, so that the amount procured will closely approximate the need of their municipality. There is always a risk of oversupply, leading to expiration of medications and wastage of limited government funds, or undersupply, leading to unavailability of essential medications. Moreover, public health officials are burdened with other tasks, such as health service delivery, personnel management, generation of health reports and much more. With the institution of mixed HCPNs, the challenges of procurement and the consequent risk of oversupply or undersupply is distributed to the private sector. Private sectors face less bureaucratic processes and are able to expend more time and resources in ensuring efficient and timely procurement of medications. This leads to a mutually beneficial collaboration within the mixed HCPNs and reduces the workload for the public sector.

In our experience with the rural site of the PPCS, we were able to integrate the health information system among the public facilities and the partner private entities, thus improving the efficiency of the health system and ensuring smooth patient flow from the primary healthcare facility to the dispensing of medications in the pharmacies. An important factor leading to the success of the EHR system integration is the installation of additional towers with long-distance routers, which unified all the 14 barangays in the rural site under a single network.

This highlights the distinct advantage of having interoperable public and private networks, which may be an important element for the successful implementation of UHC in the Philippines.

Similar to international studies, the PPCS team faced governance challenges, including procurement regulations leading to delayed payments and difficulty in creating partnerships with private pharmacies. These issues were discussed in a separate publication that discussed governance challenges in implementation of the entire PPCS programme.<sup>7</sup> The pivotal role of funding is also apparent in our study. Prescriptions and medications dispensed decreased in the second year of implementation, coinciding with the onset of the COVID-19 pandemic and the decrease in available funds. By the third year, the depletion of funds led to the steady decrease in prescriptions and dispensing of medications. This reflects that the community had lower utilisation of the primary care facility for consultation services and lower availment of prescribed drugs in the RHU or partner private pharmacy with the depletion of funds for the primary care benefit package. The need to purchase prescribed medications out-of-pocket led to a decline in healthcare utilisation both in consultation services and in purchasing the prescribed medication, which is consistent with observations from international studies.<sup>8 9</sup>

Sustainability of mixed HCPNs is an important consideration. The four pillars namely, economic, social, environmental and institutional sustainability, contribute to the sustainability of instituting mixed HCPNs.<sup>10</sup> In this case study, we observed how lack of economic sustainability led to the eventual decline of the mixed HCPN in its role to augment access of medications to the community.

Several indicators have been used to measure success of mixed HCPNs, including case detection, service provision, health outcomes, services management, utilisation, treatment success and satisfaction.<sup>6</sup> In our experience with the rural site, we used provision of medications as an indicator for the success of the mixed HCPN. Our data demonstrated that the mixed HCPN was important in providing necessary medications and strengthening the primary care system.

There are several limitations to our study. First, data was obtained from only one site. The applicability of the findings to other settings may be limited. Second, we only used one indicator to evaluate the mixed HCPN, which is provision of medications. Future research may evaluate other indicators to provide a holistic picture of the role of mixed HCPNs in strengthening primary care systems. Finally, the results of this study were obtained from data in the EHR system. The veracity of the results depends on the completeness and accuracy of the data encoded into the system.

## CONCLUSION

Creation of a mixed HCPN in a rural primary care site augmented access to essential medications. The mixed

HCPNs in the study showed potential in strengthening access to consultations and medications in a rural community. Improving these essential primary care services can facilitate implementation of UHC in the Philippines. Sustainability of instituting mixed HCPNs is an important consideration. The appropriation of adequate funds to sustain the mixed HCPNs is necessary to maximise its potential in improving primary care services.

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**Contributors** All authors contributed to the conceptualisation of the study. CSCT-L created the graphs and wrote the initial draft. All authors contributed to revising the manuscript and approved the final version of the paper. ALD is the guarantor for the overall content and conduct of the study.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Ethics approval** This study involves human participants and was approved by University of the Philippines Manila Research Ethics Board (UPMREB-2015-489-01). Participants gave informed consent to participate in the study before taking part.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available upon reasonable request. The dataset is available upon request from the corresponding author.

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