

RESEARCH ARTICLE

Stocks and distribution of doctors, nurses, and midwives in the Philippines 2020: A descriptive ecologic study

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ABSTRACT

Background: Healthcare workers remain the key players in the delivery of healthcare services. Their supply and distribution must be carefully monitored and taken care of.

Objectives: To describe the stock of doctors, nurses, and midwives in the Philippines in 2020.

Methodology: This study employed a descriptive ecologic design and involved a secondary-data analysis where the relevant statistical data were retrieved from the public database in the country's Department of Health. The data source also provides the statistics of other health professions such as medical technologists, nutritionists/dieticians, pharmacists, and dentists. However, this study limited the numerical data of the doctors, nurses, and midwives because there are readily available data for comparison. Descriptive statistics such as frequency counts, percentages, and population density were used to analyze the data.

Results: The available density of health workers (14.76 per 10,000 population) composed of doctors, nurses, and midwives in the country remains at par with the recommendation of the World Health Organization (44.5 per 10,000 population). Likewise, data showed that maldistribution of the health workforce still exists, where a greater number of them are found in urban areas such as the National Capital Region (NCR) and CALABARZON. A majority of them are also working in the hospitals (doctors = 86.64%, nurses = 76.75%, and midwives = 48.46%) than in the primary healthcare facilities (doctors = 13.36%, nurses = 23.25%, and midwives = 51.54%).

Conclusions: The study revealed that maldistribution and shortage of doctors, nurses, and midwives prevail in the country. Likewise, the available workers in the country remain at par with the recommendations to meet the targets of the sustainable development goals (SDGs). The health agency and policymakers must focus on strategies to accelerate the number of health workers required in the country and redistribute them according to the areas in dire need.

Keywords: Human resources for health, doctors, nurses, midwives, Philippines, stocks and distribution

Introduction

Healthcare workers remain as the key players in the delivery of health care services. They made integral contributions during health crises like the COVID-19 pandemic [1] and play a significant part in achieving equity in health and well-being, such as in sustaining and accelerating the implementation of Universal Health Coverage (UHC) [2].

However, the shortage of healthcare workers is a prevailing problem. It is estimated that a total of 18 million health workforce will be needed by the year 2030 [3]. Efforts are made to address this problem, such as the implementation of

the United Nations' Sustainable Development Goals (SDGs). From various targets enclosed in the 17 goals, efforts are also being made to increase the number of the recruited health workforce that is fit for this purpose, especially in developing countries [4].

Data from the Philippine Health System Review indicates that the top 3 health workers produced and working in health institutions were nurses, doctors, and midwives [5,6]. However, the Philippines is not spared from the shortage of healthcare workers in the country for many years. Apart from this, there are

also distributional challenges and the rampancy in the exportation and/or migration of health workers, primarily nurses [7]. The country continuously supplies doctors and nurses around the world, especially in the US and the UK. These healthcare workers who acquire the appropriate skills and qualifications have the intent to find a high-paying job commensurate with their respective skills and qualifications. At least 6,500 healthcare workers work abroad annually and data in 2019 showed that 17,000 Filipino nurses intended foreign employment [8]. Several reasons persist in leaving the country such as low salary and employment benefits, poor work environment, limited career opportunities, high job stress, and job burnout [7,9,10]. The basic public health services in the country are managed by the healthcare team primarily composed of public physicians, public health nurses, rural health midwives, public dentists, medical technologists, and sanitary inspectors. A standard human resource for health (HRH) to population ratio has been set where there is: 1 physician per 20,000 population, 1 nurse per 10,000 population, and 1 midwife per 5,000 population [11]. The World Health Organization (WHO) recommended a threshold of workforce density of 44.5 doctors, nurses, and midwives per 10,000 population or 4.45 doctors, nurses, and midwives per 1,000 population to achieve the SDGs [4].

This article presents an assessment of the stock and distribution of doctors, nurses, and midwives in the Philippines. This study also provides the five-year trendline of the supply of doctors, nurses, and midwives in the country. Assessing the number and distribution of doctors, nurses, and midwives in the country will serve as a piece of valid information based and is significant for planning, policy-making, and investment decisions relevant to the health workforce of the country. Moreover, the findings of the assessment may indicate the progress of the workforce in the country which might provide a decision if there is a need to scale up to achieve the threshold of workforce densities and other concerns relevant to the health workforce such as the work environment, workforce management, compensations and benefits, and the like.

Methodology

Research Design

A descriptive ecologic study design was employed in this study. Data obtained were primarily from the number and distribution of doctors, nurses, and midwives in the year 2020 but a time-trend comparison of variation of these health workers over a period of five years (2016 to 2020) was also obtained.

Data Source and Data Flow

This study involves a secondary-data analysis where the data on human resources for health (HRH) including doctors, nurses, and midwives were extracted from an open data source of the Department of Health (DOH) as of October 21, 2021, from the earlier years [12]. The data were initially utilized by an online platform (statista.com) [13] offering statistics and data reports across the globe. The online platform was initially utilized in the retrieval of data. Words and phrases such as “distribution of health workers in the Philippines” and “number of physicians in the Philippines” were entered in its search bar. It revealed the number of doctors in the country from the year 2016 to 2021 [13]. The source link of the data on the number of doctors was from the DOH generated through an interactive data visualization software known as Microsoft Power BI [12]. The data source link presents HRH in the country such as the number of dentists, medical technologists, midwives, nurses, nutritionists/dieticians, occupational therapists, pharmacists, physical therapists, medical doctors, radiologic technologists, and x-ray technologists from the year 2016 to 2021. For this study, the number of doctors, nurses, and midwives in the country from public hospitals, private hospitals, and primary healthcare facilities for the year 2020 was collected. Likewise, the five-year trendline of doctors, nurses, and midwives in the country was from year 2016 to 2020 only. Moreover, the source also presents the country's estimated population, number of private and public hospitals, number of primary healthcare facilities, and the ratio of HRH per 10,000 population.

Selection Criteria

For this study, only the aggregated number of doctors, nurses, and midwives in the country was extracted from the open data source. A compilation of comparable data for stock and distribution per region of doctors, nurses, and midwives is presented. There are a total of 17 administrative and autonomous regions across the country, wherein eight regions are in the island groups of Luzon, three regions are in the Visayas, and the six regions are in Mindanao. Moreover, according to the Philippine Statistics Authority [14], the regions with more than 50% in the level of urbanization include the NCR (100%), CALABARZON (70.5%), Region XI – Davao (66.8%), Region III – Central Luzon (66.3%), Region XII – SOCCSKSARGEN (55.5%), and Region VII – Central Visayas (51.9%). Data were then entered into Microsoft Excel for processing and analysis. Data were tabulated according to the distribution of doctors, nurses, and midwives in terms of hospitals and primary healthcare facilities at regional and national levels. Descriptive

statistics used include frequency counts and percentages. To determine the density of the health workers per 10,000 population for the whole country and each region, the population size data were extracted from the open data source of the Philippines Statistics Authority (PSA) through the 2020 Census of Population and Households [15].

Results

There are a total of 160,938 HRH comprising doctors, nurses, and midwives in the Philippines in the year 2020. As reflected in Table 1, more than half of them are nurses followed by midwives (N=42,094 or 26.15%) and doctors (N=28,639 or 17.80%). While more than four-fifths of doctors and almost three-fourths of nurses are working in hospitals, more than half

Table 1. Distribution of Human Resources for Health (HRH) According to Profession, 2020

| Profession | Number | % |
|--------------|----------------|---------------|
| Nurse | 90,205 | 56.05 |
| Midwife | 42,094 | 26.15 |
| Physician | 28,639 | 17.80 |
| TOTAL | 160,938 | 100.00 |

Table 2. Distribution of Human Resources for Health (HRH) According to Profession and Type of Health Facility, 2020

| Profession | Private Hospital N, (%) | Public Hospital N, (%) | Total Number of HRH in Hospitals (a) | Primary Health Care (LGU-Hired) N, (%) | Primary Health Care (DOH-Deployed) N, (%) | Total Number of HRH in Primary health Care (b) | Total HRH (a+b) |
|--------------|-------------------------|------------------------|--------------------------------------|--|---|--|-----------------|
| Physician | 14,343 (57.80) | 10,471 (42.20) | 24,814 | 3,131 (81.86) | 694 (18.14) | 3,825 | 28,639 |
| Nurse | 38,840 (56.10) | 30,396 (43.90) | 69,236 | 5,975 (23.93) | 18,994 (76.07) | 24,969 | 90,205 |
| Midwife | 3,786 (18.56) | 16,611 (81.44) | 20,397 | 17,112 (78.87) | 4,585 (21.13) | 21,697 | 42,094 |
| TOTAL | 56,969 (49.78) | 57,478 (50.22) | 114,447 | 26,218 (51.93) | 24,273 (48.07) | 50,491 | 160,938 |

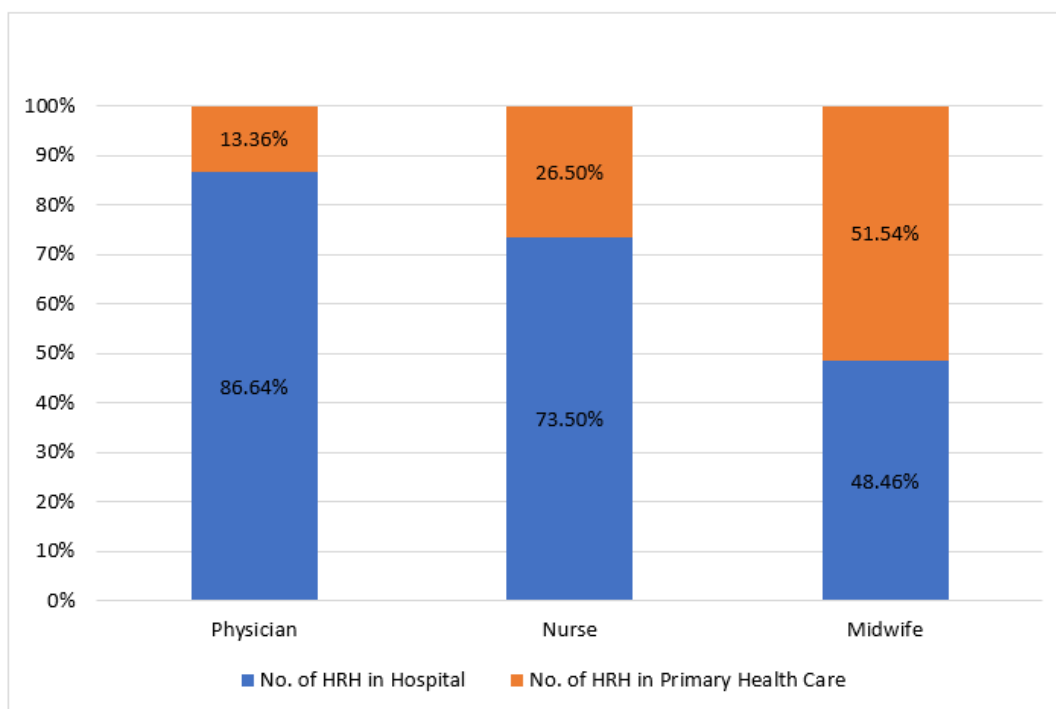


Figure 1. Distribution of Doctors, Nurses, and Midwives in Terms of Hospitals and Primary Health Care Facilities

of the midwives, are working in primary healthcare facilities such as Rural Health Units (RHUs) (Figure 1).

Table 2 showed that more than half of the doctors and nurses working in hospitals are employed by the private sector. This is in contrast with the midwives where more than four-fifths of them are in the government hospitals. For those working in primary health care facilities, the majority of the doctors and midwives are employed by their respective local government units (LGUs). On the contrary, more than three-fourths of the nurses are employed through the DOH.

Table 3.1 revealed that all regions have the most doctors working in the hospitals. The NCR, where the highly urbanized cities belong, has the highest number of doctors working in hospitals (93.33%). This is followed by Davao Region (89.84%), Central Luzon (86.76%), Central Visayas (85.21%), CALABARZON (84.87%), and Ilocos Region (83.37%). Regions with a bigger number of doctors in primary health care facilities are the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) (35.58%), MIMAROPA (Mindoro-Marinduque-Romblon-Palawan) or Region IV-B (33.17%), Eastern Visayas (23%), and CARAGA (21.74%). But the proportion is way too small for those working in the hospitals. Overall, there are 10,225 doctors in the NCR which comprise more than 1/3 of all the doctors in the Philippines.

Table 3.2 showed that the majority of the nurses are working in hospitals. The NCR has, again, the highest percentage of nurses working in hospitals (91.83%). This is followed by the regions of Central Luzon (79.24%), Western Visayas (77.94%), CALABARZON (73.64%), Central Visayas (73.36%), and Davao Region (72.54%). On the contrary, regions with a high percentage of nurses working in primary healthcare facilities include the BARMM (75.71%), and Eastern Visayas (58.06%). This is followed by CARAGA (49.60%), MIMAROPA (41.60%), and Bicol region (40%). Overall, there are 16,416 nurses in the NCR, 10,009 nurses in the CALABARZON, 7,662 nurses in the Central Visayas, and more than 5,000 nurses each in Ilocos Region, Western Visayas, and Bicol Region.

More than half of the midwives in the Philippines are working in primary healthcare facilities. The regions where a majority of midwives are in primary healthcare facilities are the BARMM (65.59%), Central Visayas (62.31%), Davao Region (62.30%), CALABARZON (59.54%), and Eastern Visayas (59.47%). On the other hand, the regions, where more midwives are working in the hospitals, are NCR (68.12%), Central Luzon (54.28%), Cagayan Valley (53.32%), CARAGA (51.10%), and Ilocos Region (50.02%). Overall, there are 4,084 midwives in the NCR, 3,672 midwives in the Western Visayas, 3,532 in the Central Luzon, 3,343 in the Central Visayas, 3,109 in the CALABARZON, and 3,013 in the Bicol Region (Table 3.3).

Table 3.1. Regional Distribution of Doctors Working in Hospitals and Primary Health Care

| Region | No. of Doctors in Hospitals | % | No. of Doctors in Primary Health Care | % | Total Doctors |
|--------------------------|-----------------------------|--------------|---------------------------------------|--------------|---------------|
| NCR | 9,543 | 93.33 | 682 | 6.67 | 10,225 |
| CAR | 571 | 80.54 | 138 | 19.46 | 709 |
| 01 - Ilocos Region | 1,103 | 83.37 | 220 | 16.63 | 1,323 |
| 02 - Cagayan Valley | 615 | 81.67 | 138 | 18.33 | 753 |
| 03 - Central Luzon | 2,360 | 86.76 | 360 | 13.24 | 2,720 |
| 04A - CALABARZON | 2,351 | 84.87 | 419 | 15.13 | 2,770 |
| 04B - MIMAROPA | 278 | 66.83 | 138 | 33.17 | 416 |
| 05 - Bicol Region | 745 | 81.42 | 170 | 18.58 | 915 |
| 06 - Western Visayas | 1,556 | 82.68 | 326 | 17.32 | 1,882 |
| 07 - Central Visayas | 1,636 | 85.21 | 284 | 14.79 | 1,920 |
| 08 - Eastern Visayas | 673 | 77.00 | 201 | 23.00 | 874 |
| 09 - Zamboanga Peninsula | 548 | 82.78 | 114 | 17.22 | 662 |
| 10 - Northern Mindanao | 798 | 81.26 | 184 | 18.74 | 982 |
| 11 - Davao Region | 928 | 89.84 | 105 | 10.16 | 1,033 |
| 12 - SOCCSKSARGEN | 548 | 80.23 | 135 | 19.77 | 683 |
| CARAGA | 360 | 78.26 | 100 | 21.74 | 460 |
| BARMM | 201 | 64.42 | 111 | 35.58 | 312 |
| TOTAL | 24,814 | 86.64 | 3,825 | 13.36 | 28,639 |

Table 3.2. *Regional Distribution of Nurses Working in Hospitals and Primary Health Care*

| Region | No. of Nurses in Hospitals | % | No. of Nurses in Primary Health Care | % | Total Nurses |
|--------------------------|----------------------------|--------------|--------------------------------------|--------------|---------------|
| NCR | 15,075 | 91.83 | 1,341 | 8.17 | 16,416 |
| CAR | 1,823 | 72.14 | 704 | 27.86 | 2,527 |
| 01 - Ilocos Region | 4,043 | 70.74 | 1,672 | 29.26 | 5,715 |
| 02 - Cagayan Valley | 2,812 | 66.51 | 1,416 | 33.49 | 4,228 |
| 03 - Central Luzon | 6,566 | 79.24 | 1,720 | 20.76 | 8,286 |
| 04A - CALABARZON | 7,371 | 73.64 | 2,638 | 26.36 | 10,009 |
| 04B - MIMAROPA | 942 | 58.40 | 671 | 41.60 | 1,613 |
| 05 - Bicol Region | 3,003 | 60.00 | 2,002 | 40.00 | 5,005 |
| 06 - Western Visayas | 4,067 | 77.94 | 1,151 | 22.06 | 5,218 |
| 07 - Central Visayas | 5,621 | 73.36 | 2,041 | 26.64 | 7,662 |
| 08 - Eastern Visayas | 1,496 | 41.94 | 2,071 | 58.06 | 3,567 |
| 09 - Zamboanga Peninsula | 2,247 | 66.58 | 1,128 | 33.42 | 3,375 |
| 10 - Northern Mindanao | 3,308 | 69.22 | 1,471 | 30.78 | 4,779 |
| 11 - Davao Region | 2,665 | 72.54 | 1,009 | 27.46 | 3,674 |
| 12 - SOCCSKSARGEN | 2,590 | 66.27 | 1,318 | 33.73 | 3,908 |
| CARAGA | 1,122 | 50.40 | 1,104 | 49.60 | 2,226 |
| BARMM | 485 | 24.29 | 1,512 | 75.71 | 1,997 |
| TOTAL | 65,236 | 72.32 | 24,969 | 27.68 | 90,205 |

Table 3.3. *Regional Distribution of Nurses Working in Hospitals and Primary Health Care*

| Region | No. of Midwives in Hospitals | % | No. of Midwives in Primary Health Care | % | Total Midwives |
|--------------------------|------------------------------|--------------|--|--------------|----------------|
| NCR | 2,782 | 68.12 | 1,302 | 31.88 | 4,084 |
| CAR | 765 | 47.93 | 831 | 52.07 | 1,596 |
| 01 - Ilocos Region | 1,409 | 50.02 | 1,408 | 49.98 | 2,817 |
| 02 - Cagayan Valley | 1,259 | 53.32 | 1,102 | 46.68 | 2,361 |
| 03 - Central Luzon | 1,917 | 54.28 | 1,615 | 45.72 | 3,532 |
| 04A - CALABARZON | 1,258 | 40.46 | 1,851 | 59.54 | 3,109 |
| 04B - MIMAROPA | 700 | 47.46 | 775 | 52.54 | 1,475 |
| 05 - Bicol Region | 1,407 | 46.70 | 1,606 | 53.30 | 3,013 |
| 06 - Western Visayas | 1,748 | 47.60 | 1,924 | 52.40 | 3,672 |
| 07 - Central Visayas | 1,260 | 37.69 | 2,083 | 62.31 | 3,343 |
| 08 - Eastern Visayas | 910 | 40.53 | 1,335 | 59.47 | 2,245 |
| 09 - Zamboanga Peninsula | 932 | 48.69 | 982 | 51.31 | 1,914 |
| 10 - Northern Mindanao | 1,254 | 48.77 | 1,317 | 51.23 | 2,571 |
| 11 - Davao Region | 567 | 37.70 | 937 | 62.30 | 1,504 |
| 12 - SOCCSKSARGEN | 1,143 | 46.67 | 1,306 | 53.33 | 2,449 |
| CARAGA | 787 | 51.10 | 753 | 48.90 | 1,540 |
| BARMM | 299 | 34.41 | 570 | 65.59 | 869 |
| TOTAL | 20,397 | 48.46 | 21,697 | 51.54 | 42,094 |

Table 4 showed that the density of doctors, nurses, and midwives per 10,000 population in the country was 2.63, 8.27, and 3.86, respectively. The highest in terms of the density of doctors is in NCR (12.17). This is followed by Cordillera Administrative Region (CAR) (3.94), Ilocos Region (2.50), Western Visayas (2.37), and Central Luzon (2.19). The lowest in terms of the density of doctors per 10,000 population is the BARMM (0.71). For the density of nurses per 10,000 population, the highest region is the CAR (14.06) followed by NCR (12.17), and Cagayan Valley (11.47). The lowest remains the BARMM (4.53). The region with the density of midwives per 10,000 population is also the CAR (8.88). This is followed by Cagayan Valley (6.41) and CARAGA (5.49). The BARMM remains the lowest density of midwives (1.97). Overall, the Philippines has a density of 14.76 health human resources of doctors, nurses, and midwives per 10,000 population. The highest region with an overall density of HRH is the CAR (26.88). This is followed by NCR (22.79), Cagayan Valley (19.92), and Ilocos Region (18.59). The lowest density of HRH is in the BARMM (7.22).

Figure 2 depicts the trendline of doctors, nurses, and midwives in the Philippines. The trend of nurses in the past five years is gradually increasing from 87,486 in 2016 to 90,205 in 2020. The supply of midwives remains almost at a

steady rate where it showed remaining at more than 42,000 midwives for four years. There was an obvious downward trend in the supply of doctors in the Philippines, where it dipped down from 40,828 in the year 2017 to 28,378 in the following year, 2018. The number remained close to 28,000 in the next two years, 2019 and 2020.

Discussion

The main purpose of this study was to determine the stock and distribution of doctors, nurses, and midwives across the Philippine archipelago. Although the primary source of the data also provides the statistics of other health professions such as medical technologists, nutritionists/dietitians, pharmacists, and dentists, as they are also significant in the delivery of health care services, the study was limited to doctors, nurses, and midwives because of available data for comparison can be accessed readily. From a total of 160,938 health workers in the country in the year 2020, 28, 639 were doctors, 90, 205 were nurses, and 42,094 were midwives.

The study indicated that the majority of doctors and nurses are working in hospital settings. Many doctors might have their personal reasons for working in the hospitals apart from getting the opportunity to better acquire specialization

Table 4. Density of Doctors, Nurses, and Midwives per 10,000 Population

| Region | Population (millions)* | No. of HRH | | | Density per 10,000 Population | | | |
|--------------------------|------------------------|---------------|---------------|---------------|-------------------------------|-------------|-------------|--------------|
| | | Doctor | Nurse | Midwife | Doctor | Nurse | Midwife | Combined |
| NCR | 13.48 | 10,225 | 16,416 | 4,084 | 7.58 | 12.17 | 3.03 | 22.79 |
| CAR | 1.79 | 709 | 2,527 | 1,596 | 3.94 | 14.06 | 8.88 | 26.88 |
| 01 - Ilocos Region | 5.30 | 1,323 | 5,715 | 2,817 | 2.50 | 10.78 | 5.31 | 18.59 |
| 02 - Cagayan Valley | 3.68 | 753 | 4,228 | 2,361 | 2.04 | 11.47 | 6.41 | 19.92 |
| 03 - Central Luzon | 12.42 | 2,720 | 8,286 | 3,532 | 2.19 | 6.67 | 2.84 | 11.70 |
| 04A - CALABARZON | 16.19 | 2,770 | 10,009 | 3,109 | 1.71 | 6.18 | 1.92 | 9.81 |
| 04B - MIMAROPA | 3.22 | 416 | 1,613 | 1,475 | 1.29 | 5.00 | 4.57 | 10.85 |
| 05 - Bicol Region | 6.08 | 915 | 5,005 | 3,013 | 1.50 | 8.23 | 4.95 | 14.69 |
| 06 - Western Visayas | 7.95 | 1,882 | 5,218 | 3,672 | 2.37 | 6.56 | 4.62 | 13.54 |
| 07 - Central Visayas | 8.08 | 1,920 | 7,662 | 3,343 | 2.11 | 8.44 | 3.68 | 14.23 |
| 08 - Eastern Visayas | 4.54 | 874 | 3,567 | 2,245 | 1.92 | 7.84 | 4.94 | 14.70 |
| 09 - Zamboanga Peninsula | 3.87 | 662 | 3,375 | 1,914 | 1.71 | 8.71 | 4.94 | 15.36 |
| 10 - Northern Mindanao | 5.02 | 982 | 4,779 | 2,571 | 1.96 | 9.51 | 5.12 | 16.59 |
| 11 - Davao Region | 5.24 | 1,033 | 3,674 | 1,504 | 1.97 | 7.01 | 2.87 | 11.85 |
| 12 - SOCCSKSARGEN | 4.90 | 683 | 3,908 | 2,449 | 1.39 | 7.97 | 5.00 | 14.36 |
| CARAGA | 2.80 | 460 | 2,226 | 1,540 | 1.64 | 7.94 | 5.49 | 15.07 |
| BARMM | 4.40 | 312 | 1,997 | 869 | 0.71 | 4.53 | 1.97 | 7.22 |
| TOTAL | 109.03 | 28,639 | 90,205 | 42,094 | 2.63 | 8.27 | 3.86 | 14.76 |

* Retrieved from the Philippine Statistics Authority, 2020 Census of Population and Household

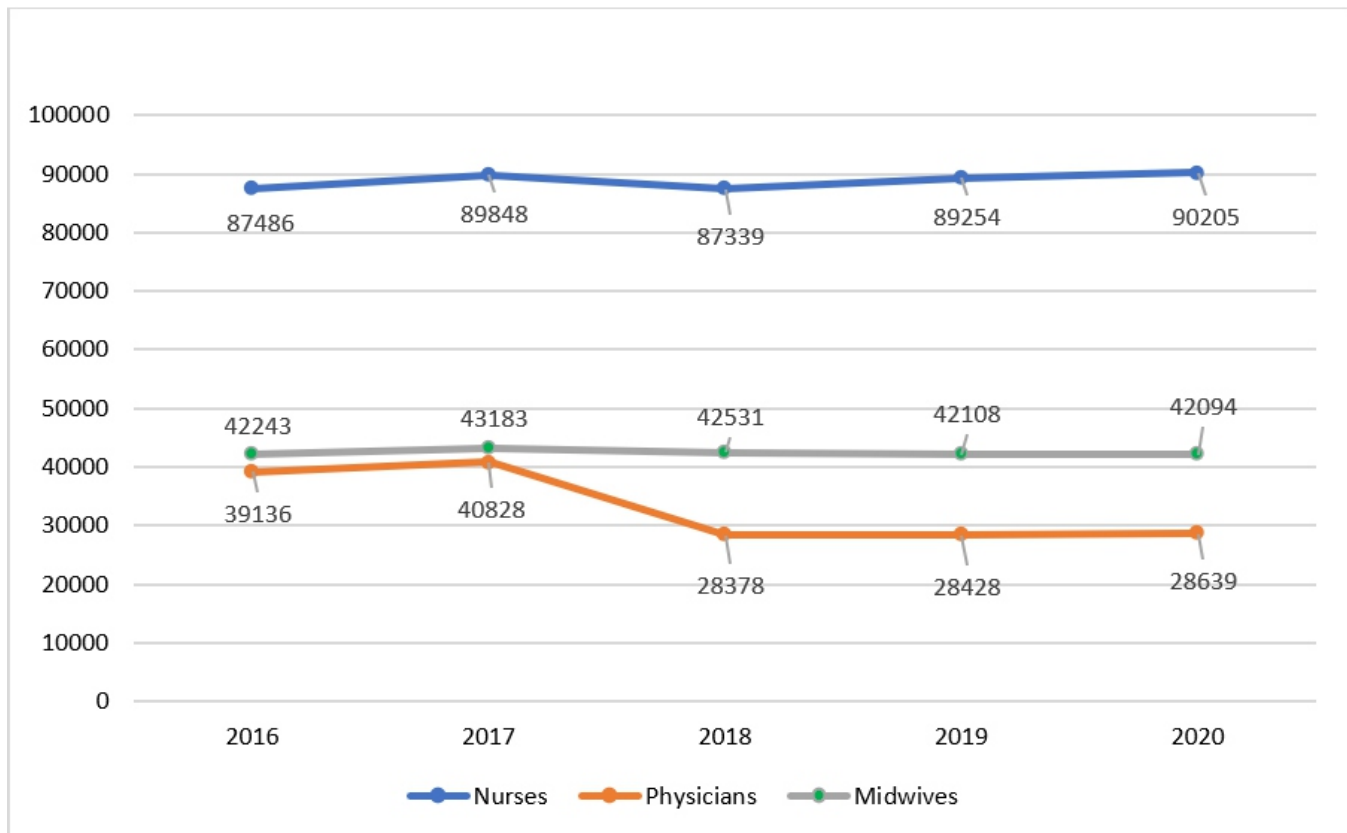


Figure 2. Five-Year Trendline of Doctors, Nurses, and Midwives in the Philippines

in practice. Moreso, previous studies demonstrated that working in primary care and rural settings offers lower salaries, provides poor opportunities for career advancement and professional development, and has a poor work environment and living conditions [16,17]. In addition, for nurses, it is a big opportunity to work in hospitals and earn a certain period of work experience as a primary requirement in working abroad [18]. Nevertheless, the WHO made policy recommendations to increase health manpower in remote and rural areas through a strategized retention mechanism [19]. Likewise, here in the Philippines, local universities made significant interventions to address the need to provide healthcare manpower in the unserved and underserved rural communities [20]. However, our study findings showed that more than half of the midwives are working in primary healthcare settings. Midwives are not only significant in the care of mothers and their children, but they are integral in community health care. They provide basic and essential community health services, conduct home visits, follow-up, and monitor pregnant women and post-partum stage for antenatal, postnatal, and newborn care and support [21].

The study also showed that there is an unequal distribution of doctors, nurses, and midwives across the

seventeen regions in the Philippines. The NCR, where the highly urbanized cities are located, remains the highest number of healthcare workers. Likewise, this is the region where the majority of the doctors and nurses are working in the hospitals. This trend is also similar to other regions with a great number of healthcare workers such as the Central Visayas, CALABARZON, Davao Region, Central Luzon, Western Visayas, Ilocos Region, and Bicol Region. These are the regions where there are also several highly urbanized cities. On the other hand, regions with the least numbers of healthcare workers include the BARMM, MIMAROPA, CARAGA, CAR, and the Zamboanga Peninsula. It is worth noting that these regions have the greater rural and remote areas in the Philippines. However, many of their doctors, nurses, and midwives are working in the hospitals than in the primary care facilities except for BARMM, where most of their nurses and midwives are in the primary health care facilities. Personal, organizational, economic, political, and cultural factors could be attributed to this regional imbalance in the health workforce [22]. For instance, they practice their profession in areas with better economic and professional opportunities that are commonly found in urbanized regions than in rural ones [23]. On the other hand, even if there is a dire need for health workers in rural

areas, local government units (LGUs) could hardly produce, recruit and retain them because of budgetary constraints and a lack of plantilla items [24,25].

In 2006, the WHO recommended a density threshold of 22.8 doctors, nurses, and midwives per 10,000 population [26]. This has been revised in 2016 where the recommended density threshold is 44.5 doctors, nurses, and midwives per 10,000 population [4]. The estimated density has been revised to meet the targets of the SDGs. With the two recommendations, the Philippines is at par to meet the density of doctors, nurses, and midwives. None of the 17 regions also meet the revised recommendation. However, the NCR and CAR achieved the 2006 recommendation for the density of healthcare workers. A similar study in 2019 showed that the Philippines is close to achieving this revised density threshold where it reached 40.8 per 10,000 population which, apparently is above the 2006 WHO threshold [27]. This declining accomplishment showed significant implications for the health agency and the country's health care system. The country is continuously hurdling health challenges and demands coupled with the emergence and re-emergence of communicable diseases, the rising of non-communicable diseases, the threats of climate change and natural disasters, and the demands on modern life and technology. It is therefore integral to increase the number of available doctors, nurses, and midwives working in the country with considerations on the equity of the health workforce both in the hospitals and the primary healthcare facilities.

Lastly, the study also showed that the supply of nurses and midwives are steadily increasing in the past five years. It is, however, surprising for a sudden decline of doctors of more than 12,000 from the year 2017 to year 2018 and subsequently 2019, and 2020. It is interesting to scrutinize the reasons for the sudden drop in many doctors in this period. Nevertheless, a 2019 annual report of the DOH revealed an adequate number of doctors, nurses, and midwives in the provinces [28]. A previous study showed that the density of healthcare workers has greatly increased since 1990 [27], but because of the demands in health and the increasing population, the number of doctors, nurses, and midwives must continuously increase from time to time.

Previous empirical evidence showed that the health workers commonly produced by the country include nurses, doctors, and midwives since the 1950s [5,6,27,29]. However, these data also showed that the country's health system remained under the problem of the shortage and maldistribution of health workers. These data are consistent

with the findings of the current study. As such, the results of the study highlight some significant policy implications to address better this prevailing problem. Policymakers and health agencies need to design or redesign existing programs, strategies, and policies that will attract and retain more healthcare providers in the country, especially in rural and remote areas. While overseas workers provide dollars and revenues to the country, the Filipino people also need healthcare workers who are serving well with satisfying remuneration and a favorable work environment. Additionally, both the government and the private sector must work hand-in-hand to mainstream the supply of healthcare workers for the country so that a greater number will be provided for areas in dire need of a health workforce.

Apparently, significant efforts have been made by the government to address the shortage and maldistribution of doctors, nurses, and midwives in the country. The passage of the Universal Health Care (UHC) law mandates the DOH, to design national HRH support system, scale-up scholarships, and training programs, and establish a national program that will require medical and health-related programs graduates who were government-funded scholars to enter into a return service agreement (RSA) for service commitment through employment in areas in dire need of public health [30]. Certain state universities and colleges (SUCs) of the country have already implemented the RSA scheme as an avenue to address the shortage and maldistribution of health workers. The University of the Philippines (UP) School of Health Sciences (SHS) in Palo, Leyte offers a stepladder, competency-based, and community-based curriculum that produces midwives, nurses, and doctors intended to work in priority areas for public health as strengthened by the RSA [20]. Likewise, the UP College of Medicine and the Pamantasan ng Lungsod ng Maynila, College of Medicine implemented the RSA for their students in the Doctor of Medicine programs [30]. The DOH implemented some strengthening programs for HRH such as the Medical Pool Placement and Utilization Program (MP-PUP) and Doctors to the Barrios (DTTB) Program for the deployment of physicians in DOH hospitals and RHUs in 4th to 6th class municipalities, the Nurse Deployment Program (NDP) for nurses and the Rural Health Midwives Placement Program (RHMP) in the RHUs. The agency also implemented the Pre-Service Scholarship Program for full scholarships to the students in the Doctor of Medicine and Midwifery programs, and in return, they will be employed as return service for two years for every year of the scholarship [11]. The number and distribution of doctors, nurses, and midwives in the Philippines will greatly affect the performance of the

country's health system. As such, interventions and programs like these must be sustained and enriched.

Limitations of the Study

First, the data obtained were only from health workers who were institutionally employed in public and private hospitals and primary care facilities. It did not reflect doctors, nurses, and midwives providing services in their private clinics. The provision of a database about health workers who are actively practicing their professions privately must be made accessible. Secondly, as this study involves only secondary and aggregate data, the study describes only the quantity and distribution of health workers. It did not explore the basic competencies and motivation of the health workers in performing health care and services in the country which are also necessary attributes towards a quality health care delivery system. Further studies are needed which will also explore these attributes to the doctors, nurses, and midwives of the country. Nevertheless, this study involves a large scale of HRH data which serves as critical evidence in enhancing the health workforce in the country towards improved and accessible healthcare services, especially in the underserved and unserved areas.

Conclusion

This study highlights the stock and distribution of doctors, nurses, and midwives in the Philippines. The study revealed that the maldistribution of the health workforce prevails in the country. Likewise, the available workers in the country remain at par with the recommendations to meet the targets of the SDGs. The government must accelerate interventions to address these issues.

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