



## Descriptive Analysis of the Workload at Referral Hospitals in Cambodia: The Need of Public Health Related Skills

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### ABSTRACT

#### Introduction

Referral hospitals (RH) are to serve the population at province or district levels by providing Complementary Package of Activities (CPA). Besides conventional clinical services offered at the RH, other services are equally essential in supporting the operation of a hospital such as providing health education to patients and their care takers, conducting orientation and continuing education to health staff, providing technical support and supervision. This paper aimed to quantify the workload of public health related activities performed at CPA1 hospitals in Cambodia and to reflect the need of these skills in the hospital settings.

#### Methods

The data were based on the WHO-WISN application (Workload Indicator of Staffing Need) conducted in 12 RHs with CPA1 from 12 provinces in Cambodia in 2021. WISN tools were used to calculate the total person-time available to perform all the task for each staff, and the service activities were used to estimate the workload for each task.

#### Results

All 12 RHs with CPA1 have established services mainly into main four categories, namely out-patient, in-patient, diagnostic and treatment, and administration and management support. On average, each CPA1 hospital employed a total of 50 staff. However, no public health professionals have been employed in these RHs. The results from the workload analysis in 2021 revealed that high proportion of person-hour spent at a CPA1 hospital was on treatment and care. Public health tasks accounted for 17% of the total workload, while the tasks related to health prolonging life accounted for 68% and non-health tasks) accounted for 15%.

#### Conclusion

Workload analysis of staff working found that close to one in five of the total workload performed by RH staff required public health skills. Therefore, the RHs need health professionals who have skills in hospital management, planning, health promotion and prevention. Further research is needed to estimate the magnitude of the need of public health skills more accurately if all activities included in the CPA guideline to be offered at the CPA1.

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## Introduction

Hospitals have been playing a key role in prolong life of the patients by focusing on providing accurate diagnosis, effective and timely treatment, with proper care and rehabilitation. Consequently, medical doctors and other professions are recruited to work at both public and private hospitals. In public hospitals, referral hospitals (RHs) are to serve the population at province or district levels by providing complementary package of activities (CPA), which is classified into 3 levels based on number of staff and physicians, number of beds, medicines medical equipment, and clinical activities. CPA 1 is a referral hospital that has no grand surgery (without general anesthesia) but at least it should have obstetric service [1].

Besides conventional clinical services offered at a RH including out-patient consultation, emergency medicine (Intensive Care Unit), pediatrics, general medicine, other services are equally essential in supporting the day-to-day hospital operation as an organization. According to CPA guideline, the RH has roles in supporting primary health care, such as providing health education to patients and their care takers, conducting orientation, continuing education to healthcare staff, providing technical support, supervision, and planning [2].

It has been found that nursing unit managers, in south African hospitals, spent close to 4.0% of their workload on education, 13.4% on support and communication, 3.9% on managing stock and equipment, 11.5% on staff management, and 11.8% on miscellaneous activities [3]. The study at the hospital in Western Sweden, found that the nurses generally spent 38.0% of their working time with patients on nursing care and the remaining time on activities which were not in direct contact with the patients [4]. Less than one third of registered nurses' work time in a Swiss university hospital spent with patients, mostly time to the 'communication and care coordination' and 'care planning', whereas 'optimizing the quality and safety of care', 'integrating and supervising staff' and 'client education' were allocated the least time [5]. Two-thirds of doctors' time in the hospital in Sydney, Australia was consumed by three work categories: professional communication, social activities, and indirect care [6]. In the hospital in Southern Germany, physicians spent 25.5% of their time at work in direct contact with patients. Most of their time allocated to documentation and conversation with colleagues and nursing staff. Physicians performed parallel simultaneously activities for 17–20% of their work time [7].

Hospital management component, which include administration, planning, accounting, health information system, Infection control, patient referral system, communication, and logistics are indispensable for any hospital to functioned well and to improve the quality of its services.

The involvement of medical doctors in hospital governance found that in 18 out of 19 countries medical doctors are parts of the hospital leadership, and in some countries together with a manager from another background, i.e., economics, health care administration, nursing, law, or epidemiology [8].

This raised a question of the need of public health skills which mostly focus on quality management, patient-doctor relationship, and other health improvement interventions at our referral hospital. This paper attempted to quantify the workload of public health related activities performed at CPA1 hospitals, where many public health related activities are offered, in Cambodia to reflect the need of these skills.

## Methods

This paper used existing data derived from the workforce assessment using WHO WISN software (Workload Indicator of Staffing Need) in 12 RHs with CPA1 from 12 cities/provinces in Cambodia in 2021 such as Phnom Penh, Kandal, Tbong Khmum, Monduliri, Kampong Speu, Takeo, Kep, Kampong Chhnang, Banteay Meanchey, Siem Reap, Preah Vihear and Kratie. The WISN assessment was conducted by the National Institute of Public Health (NIPH) aiming at estimating the health workforce needed at CPA1 RHs in 2021. During the assessment, the assessor collected number of staff, duration of performed services through observations, document reviews, and interview with health providers

WISN tools (an excel based worksheets) were used to calculate the total person-time available to perform all the tasks for each staff; and the service statistics were used to estimate the workload for each task. Then the person-time spent for each task were entered into STATA version 15 to estimate the average and its 95% Confident Interval.

Also, the authors reviewed all reported activities in each hospital and grouped those activities in three categories: (1) tasks that required public health skills including hospital management, quality improvement services, patient communication, health information, accounting, health education and other tasks that related to health promotion and disease prevention and (2) tasks that related to patient care and treatment and (3) other tasks related to cleaning and

transportation and other non-specific activities. Then, the time-spent on each task was generated to estimate the workload of each type at the CPA1 hospital. The person-hour was calculated by summing Workload Statistics (WS), Category Allowance Standard (CAS) and Individual Allowance Standard (IAS).

## Results

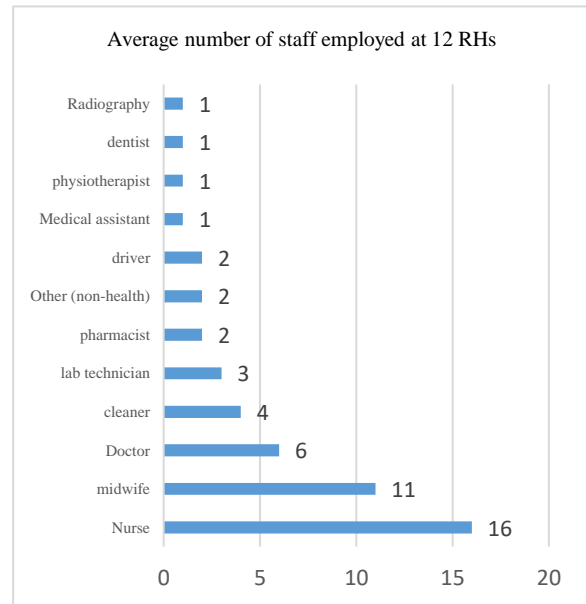
All 12 RHs with CPA1 consisted of services/wards that could be grouped into four main categories, namely out-patient, in-patient, diagnostic and treatment, and administration and management support (**Table 1**). Out-patient services included triage and medical consultation, while in-patient services included emergency and intensive care, pediatric and general medicine, infectious disease, gynecology, and obstetrics. Diagnosis and treatment category included laboratory, pharmacy, and radiology, but not all RHs with CPA1 had radiography and imagery. Administrative and management supports included administration, accounting, IT, cleaning, transportation and referral and other activities related to the management of the hospitals such as planning and cross-cutting services to improve the RH quality such as infection control and technical working groups (TWGs) within the hospital.

Overall, we found that health staff spent 49% of the time on in-patient services followed by administration and management (30%), out-patient services (12%) and diagnostic and treatment (8%).

**Table 1:** List of services commonly performed at 12 RHs:

| Nr           | Services/units                | Average person-hour per year in 12 RHs | %           |
|--------------|-------------------------------|--|-------------|
| 1            | Out-patient services          | 7,569                                  | 12%         |
| 2            | In-patient services           | 30,449                                 | 49%         |
| 3            | Diagnostic and treatment      | 5,186                                  | 8%          |
| 4            | Administration and management | 18,615                                 | 30%         |
| <b>Total</b> |                               | <b>61,819</b>                          | <b>100%</b> |

On average, each CPA1 hospital employed a total of 50 staff, consisting of doctors, medical assistants, nurses, midwives, lab technicians, pharmacists, physiotherapists, dentists, radiography technicians, information technology staff, administrators, accountants, drivers, cleaners, and others. However, no public health professionals (defined as those who had degree in public health or hospital management, health promotion, or epidemiology) were employed in these RHs (**Figure 1**).



**Figure 1:** Average number of staff employed at 12 RHs

The results from the workload analysis revealed that high proportion of person-hour spent at a CPA1 hospital was on prolonging life (Out-patient service, In-patient service and Diagnosis and treatment). The activities on health education, quality improvement, planning, reporting was classified as promoting health (public health tasks) while others were included cleaning, transportation, sick/maternity leave...etc.). **Table 2** shows an example of workload spent on promoting health, which shared 22% of the total workload at the Chaktomuk RH (a hospital located in Phnom Penh).

In terms of workload, public health tasks accounted for 17% of the total workload, while the tasks related to prolonging life (Out-patient service, In-patient service and Diagnosis and treatment) accounted for 68% and others (non-health) accounted for 15%. (**Table 3**).

## Discussion

The workload estimates from health facilities were based on the utilization data in 2021 where Cambodia was affected by the COVID-19 pandemic and, due to lockdown and the fear of getting COVID-19. Therefore, the service utilization at health facilities might be not similar to the pattern before the COVID-19 pandemic. In this study, the number of OPD visits among the 12 RHs in 2019 (pre-COVID-19) was about 8% out of the total population in the catchment areas while the number of OPD visits in 2022 was only 5%, and the drop might be due to the interruption caused by COVID-19.

**Table 2:** Example of person-time spent on various services at Chaktomuk RH with CPA1 in Phnom Penh) in 2021

| Group activities                     | Workload statistics (WS)* | Individual Allowance Standard (IAS) plus Category Allowance Standard (CAS)* | Total person-hour   |
|--------------------------------------|---------------------------|---|---------------------|
| <b>Prolonging life:</b>              |                           |   |                     |
| - Out-patient service                | 24037                     | 22380   | 46417 (67%)         |
| - In-patient service                 |                           |   |                     |
| - Diagnosis and treatment            |                           |   |                     |
| <b>Promoting health:</b>             |                           |   |                     |
| - Hospital management                | 2333                      | 12830   | 15163 (22%)         |
| - Disease prevention                 |                           |   |                     |
| - Accounting                         |                           |   |                     |
| - Administration                     |                           |   |                     |
| - Management, IT                     |                           |   |                     |
| <b>Others:</b>                       | 0                         | 8130  | 8130 (11%)          |
| Cleaning, transportation, sick leave |                           |   |                     |
| <b>Total</b>                         |                           |   | <b>69805 (100%)</b> |

\*Note: The figure was estimated by the WISN tools (User's manual: <https://www.who.int>)

**Table 3:** Percentage of different tasks implemented at 12 RHs with CPA1

| No                      | RH                | Province         | % Public health task       | % Prolonging life         | % Others                   |
|-------------------------|-------------------|------------------|----------------------------|---------------------------|----------------------------|
| 1                       | Chaktomuk         | Phnom Penh       | 22%                        | 67%                       | 12%                        |
| 2                       | Kandal Stung      | Kandal           | 23%                        | 74%                       | 3%                         |
| 3                       | Oreang Ov         | Tbong Khmum      | 11%                        | 73%                       | 16%                        |
| 4                       | Koh Nhek          | Monduliri        | 17%                        | 63%                       | 20%                        |
| 5                       | Trapaing Kraloeng | Kampong Speu     | 11%                        | 74%                       | 15%                        |
| 6                       | Ang Roka          | Takeo            | 9%                         | 77%                       | 13%                        |
| 7                       | Kep               | Kep              | 21%                        | 64%                       | 15%                        |
| 8                       | Kampong Tralach   | Kampong Chhnang  | 25%                        | 54%                       | 22%                        |
| 9                       | Phnom Srok        | Banteay Meanchey | 16%                        | 75%                       | 9%                         |
| 10                      | Angkor Chum       | Siem Reap        | 10%                        | 68%                       | 22%                        |
| 11                      | Chum Ksan         | Preah Vihear     | 22%                        | 59%                       | 19%                        |
| 12                      | Snoul             | Kratie           | 19%                        | 67%                       | 14%                        |
| <b>Average (95% CI)</b> |                   |                  | <b>17%</b><br>(9.1% - 24%) | <b>68%</b><br>(53% - 77%) | <b>15%</b><br>(3.1% - 22%) |

A study in Burkina Faso, Ethiopia, and Nigeria on barriers to healthcare access and service disruptions caused by COVID-19 revealed that the health services and HIV/surgical/other services had a slightly higher percentage of interruption (33%) compared with maternal health services (31%) [9]. The study on impact of COVID-19 on dermatology outpatient services in England in 2020 found that during lockdown, the total appointment dropped to 58%, first attendances to 43%, follow-ups to 51% and day cases to 37% of pre-lockdown values [10].

Though the analysis defined public health related tasks in hospital settings, it is not possible to accurately quantify the person-time allocated to perform these assumed public health related tasks because of WISN inputs were based on the self-report of the health staff only. However, since this finding is primarily used as evidence to illustrate the need of public health skills in hospital settings, the bias on the estimation would not significantly prevent the claim that there is a need of

public health skills to perform some indispensable tasks at hospitals.

The Workload Statistics (WS) were based on the task implemented at the selected health facilities. However, if all tasks assigned for CPA1 guideline had been adopted at all CPA1 hospitals, especially tasks that not directly related to patient care and treatment, the workload for public health related tasks would be higher. Therefore, the workload of 17% presented in this study could be underestimated if CPA1 hospital adopted all activities set in the CPA1.

## Conclusion

The analysis of the workload of staff working at 12 CPA1 hospitals in Cambodia found that close to 20% of the total workload performed by hospital staff required public health skills. Therefore, the hospitals need staff who have skills in hospital management and administration, planning health promotion and disease

prevention. Further research is needed to estimate the magnitude of the need of public health skills more accurately if all activities included in the CPA guideline to be offered at the CPA1.

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