

Situation and the need of specialist surgeons working in provincial and district hospitals by ecological regions throughout Vietnam

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Abstract

Introduction: Surgical pathologies account for 28-32% of the global disease burden, however human resource in surgery (surgical workforce) is still not good enough. The study aimed to describe the current situation and the need of specialist surgeons for working in provincial and district hospitals by representation of ecological regions (ecoregions).

Patients and methods: A cross-sectional study has conducted in 7 provinces/cities with 27 hospitals.

Results: The current number of surgeons was mostly distributed for the Coastal and Southern Central regions accounted for 23.3%; in Red River Delta was 22.3%. The need for surgeons for the Central Coast and South-Central region (30.6%) was the highest, but its lowest in the Central Highlands region for 2025. The distribution of surgical workforce according to the hospital classification categories showed that the surgeons commonly work in provincial level (81.1%). The need for surgeons for provincial hospitals was the highest as 78.4%.

Conclusion: The distribution of surgical workforce was unbalanced among ecoregions, especially there was a shortage of specialist surgeons such as neurosurgeons, cardiovascular and pediatric surgeons. It is recommended to support in-depth training in professional knowledge and skills and prioritize short-term, more practical types.

Keywords: Human resource situation, human resource needs, demand for doctors, surgeons

Introduction

Nowadays, the worldwide population is increasing rapidly and has reached more than 7 billion people. It is estimated that the population will reach 9 billion by 2050.¹ Therefore, the burden of disease also increases significantly. Among them, surgical pathology accounts for 28-32% of the global burden

of disease.² According to a study published in the Lancet Global Health journal, at least 321.5 million surgeries will be performed around the world to address the surgical disease burden for an estimated 6.9 billion people globally. The number of surgeries can vary from region to region, from the need for about 3,383 surgeries per 100,000 population in

Latin America to about 6,495 surgeries per 100,000 population in Western sub-Saharan Africa.³ It was shown that the burden of disease is often most severe in regions where human resources (doctors, nurses, pharmacists, and other health workers) are scarce.⁴ This requires for the medical system in general as well as the surgical system in particular. We need development orientations both in terms of quantity and quality of health workforce to meet people's needs.

Regarding this issue, the coverage rate of doctors was also low in some areas with high population density and in regions with rapid population growth. Fully trained surgeons and anesthesiologists represent only a small percentage of the total health workforce. In the Middle East, Southeast Asia, and Africa, the number of health workers per 1,000 people is well below the minimum requirements by the World Health Organization (WHO).⁴ Many countries in Africa, for example, Tanzania and Ethiopia, have about 0.6 surgeons per 100,000 population, while this numbers in the United States and Canada are 51 and 26 surgeons per 100,000 population, respectively. To have a similar density of surgeons to Canada, East African countries are estimated to need an additional 42,000 surgeons.⁵ In Vietnam, the number of medical doctors, pharmacists, and nurses per 10,000 population was 9.81, 2.85, and 10.9 respectively in 2020. Thus, if the estimation is based on the current population in our country (97.34 million people), it will be needed at least 184,946 doctors in the next 5 years, not including the number of doctors who were retired and switch to work and the population will grow in the upcoming years.⁶ However, there are no available data on surgical workforce in our country.

Therefore, we conducted the study with the objective is to describe "The current situation and the need of specialists surgeons working in provincial and district hospitals by ecological regions throughout Vietnam" in order to provide more information that contributes to the basis of this professional development orientation.

Materials and methods

Subjects

Quantitative subjects: Data on the current

situation and need for specialized surgeons from 2020-2025 which collected from the Head of the personnel department.

Qualitative subjects: Direct interviews with leaders of the Department of Health (DOH); Hospital Leaders; Head of the Department of Surgery.

Methodology

Time and site:

Time: 18 months (from December 2020 to June 2022)

Site: Hospitals and DOH in 7 provinces/cities representing for 7 ecoregions. The selection criteria of each province included: DOH, 01 Provincial General Hospital, 02 District General Hospitals, and Provincial Specialized Hospitals. There were 07 DOH in total; 07 Provincial/City General Hospitals, 14 District General Hospitals/City, and 6 Specialized Hospitals

Study design: Quantitative and qualitative cross-sectional descriptive.

Sample size and sampling:

Quantitative: A total of 27 reports from 27 hospitals were collected according to the form of study

Qualitative: 11 leaders of DOH, 52 leaders of hospitals, and 117 leaders of faculties were invited to participate in the interview.

Study variables:

Quantitative: Ecoregions; Hospital classification; The number of surgeons included the specialty: General surgery, Orthopedics Surgery, Pediatrics Surgery, Neurosurgery, Thoracic Surgery, Cardiovascular Surgery, Urological Surgery, Gastrointestinal surgery, Spine surgery, and other surgery; Academic degree classification; the need for surgical workforce by 2022-2025

Qualitative: the actual situation of health workforce (quantity, quality) majoring in Surgery; Opportunities and challenges with surgical workforce; Competency of surgeons

Research process:

Contacting and sending the requirement letters to DOH and hospitals at all levels

Contacting and sending the form and the requirements for selection criteria of interviewer in advance:

Quantitative:

Preparing the data collection form.

Identifying sources and channel for collection of

information: discuss with the hospital contact person who is responsible for information to collect.

Qualitative:

Sending a request to the hospital contact person for selecting the in-depth interviews

Discussing and selecting staff to participate in the interview

Scheduling and inviting them to participate

Working in site and collecting information according to the designed form:

Quantitative:

Collecting the data according to the approved form

Checking the completeness and logic of the data in the field

Qualitative:

Organizing in-depth interviews according to the scheduled program.

At each interview: introducing the purpose of the study, obtaining consent to participate, recording and conducting the interview

Taking notes of the interview process, recording it if allowed

Statistical analysis:

Quantitative variables: After having checked

the collected data, cleaned, encrypted, and entered by Redcap software; The data was analyzed and processed by Stata software; The quantitative variables were presented as mean ± standard deviation (SD) if the data was normal distribution and were shown as the median and interquartile range (IQR) if the data was non-normal distribution. The qualitative variables were presented as proportions.

Qualitative variables: In-depth interviews were recorded to analyze qualitative results according to content/topics

Research ethic aspect:

The study strictly adheres to the ethics of biomedical research. Research subjects were clearly explained about the study and agreed to participate in the study. Personal information is confidential and used for research only. The study was approved by the Ethic Committee in Biomedical Research of Hanoi Medical University. Certificate of approval from the Ethics Council in Biomedical Research No. 750/GCN-HĐĐNCYSH- Cardinal was awarded on July 26, 2022

Results

Table 1. Current situation and need for specialized surgical workforce by ecoregions

| Ecoregions | Current situation | | | | Needs | | | | | | | |
|---------------------------------|-------------------|------|------|------|-------|------|------|------|------|------|------|------|
| | 2020 | | 2021 | | 2020 | | 2021 | | 2020 | | 2021 | |
| | n | % | n | % | n | % | n | % | n | % | n | % |
| Northern Midlands and Mountains | 39 | 7.2 | 36 | 6.6 | 46 | 10.0 | 54 | 10.3 | 61 | 10.8 | 62 | 10.7 |
| Red River Delta | 123 | 22.7 | 122 | 22.3 | 116 | 25.3 | 128 | 24.5 | 129 | 22.8 | 132 | 22.7 |
| North Central Coast | 84 | 15.5 | 88 | 16.1 | 92 | 20.1 | 115 | 22.0 | 130 | 23.0 | 131 | 22.5 |
| South-Central Coast | 115 | 21.3 | 127 | 23.3 | 140 | 30.6 | 136 | 26.0 | 160 | 28.3 | 176 | 30.2 |
| Central Highlands | 92 | 17.0 | 84 | 15.4 | 1 | 0.2 | 4 | 0.8 | 5 | 0.9 | 3 | 0.5 |
| Southeast regions | 39 | 7.2 | 47 | 8.6 | 17 | 3.7 | 22 | 4.2 | 16 | 2.8 | 12 | 2.1 |
| Mekong River Delta | 49 | 9.1 | 42 | 7.7 | 46 | 10.0 | 64 | 12.2 | 65 | 11.5 | 66 | 11.3 |
| Total | 541 | | 546 | | 458 | | 523 | | 566 | | 582 | |

Table 1 showed that the current situation and needs of specialized surgical workforce were concentrated in two regions, the Red River Delta (22.3% - 25.3%) and the South-Central Coast (21.3 % - 30.6%).

The regions such as the Northern Midlands and Mountains, the North Central Coast, and the Mekong River Delta tend to increase the need for specialists surgeons, with the number of surgeons in 2020

reaching 39, 84, and 49, respectively. Then by 2025, the need will increase to 62, 131, and 66 surgeons, respectively. Meanwhile, the Central Highlands and

Southeast regions tended to reduce the needs for specialists surgeons, with 92 and 39 surgeons in 2020 and 2021 but reduced to 3 and 12 surgeons in 2025.

Table 2. Current situation and needs for specialized surgical workforce by the health care classification categories

| Healthcare classification categories | Current situation | | | | | | Needs | | | | | |
|--------------------------------------|-------------------|------|------|------|------|------|-------|------|------|------|------|------|
| | 2020 | | 2021 | | 2022 | | 2023 | | 2024 | | 2025 | |
| | n | % | n | % | n | % | n | % | n | % | n | % |
| Provincial General Hospital | 439 | 81.1 | 438 | 80.2 | 359 | 78.4 | 402 | 76.9 | 427 | 75.4 | 447 | 76.8 |
| District General Hospitals | 33 | 6.1 | 44 | 8.1 | 38 | 8.3 | 65 | 12.4 | 76 | 13.4 | 75 | 12.9 |
| Provincial Specialized Hospitals | 69 | 12.8 | 64 | 11.7 | 61 | 13.3 | 56 | 10.7 | 63 | 11.1 | 60 | 10.3 |
| Total | 541 | | 546 | | 458 | | 523 | | 566 | | 582 | |

Table 2 showed the current situation and need for specialized surgical workforce in provincial general hospitals accounted for the largest proportion (75.4% - 81.1%). Surgeons in district general hospitals

tended to increase the demand for health workforce , with 33 surgeons in 2020 (6.1%) to 75 surgeons in 2025 (12.9%). Specialized hospitals have stable the number of surgeons over the years (10.3% - 12.8%).

Qualifier box 1. Current situation of surgical workforce

| | District general hospital | Provincial general hospital | Specialized hospital |
|-------------------------|---|---|---|
| The number of surgeons | <p><i>"In general, there are good enough surgeons for medical examination and treatment, but there is a shortage in some specialties such as neurosurgery."</i></p> <p>(Male, 41 years old, Dean of District Health Center)</p> <p><i>"The number of health workforce is sufficient to cover the specialties".</i></p> <p>(Male, 38 years old, Vice Dean of District Health Center)</p> | <p><i>"There are not enough health workforce in the department, there are only six doctors for caring a large number of patients."</i></p> <p>(Male, 53 years old, Deputy Head of the Department of Provincial General Hospital)</p> <p><i>"Enough or not depends on the implementation. Currently, there is lacking."</i></p> <p>(Male, 50 years old, Deputy Director of the Provincial Department of Health)</p> | |
| The quality of surgeons | <p><i>"...in terms of health workforce, they always fulfill the requirements of clinical practice".</i></p> <p>(Male, 51 years old, head of a district hospital)</p> <p><i>"There is still a lack of knowledge and skills because most of them are junior doctors and new graduates. Many doctors have not able to practice independently such as anesthesiologists, surgeons and obstetricians, and gynecologists."</i></p> <p>(Male, 59 years old, deputy director of district health center)</p> | <p><i>"Trained doctors have good knowledge and meet the requirements for clinical practice."</i></p> <p>(Male, 54 years old, Head of Department of Provincial Hospital)</p> <p><i>"They can treat common diseases. Good attitude and skills. They can perform common surgery and teach these skills to surgeons at district general hospitals."</i></p> <p>(Male, 53 years old, Deputy Head of the Department of Provincial Hospital)</p> | <p><i>"The junior surgeons have a good clinical practice, but still lack experience as well as management skills."</i></p> <p>(Male, 40 years old, Deputy Director of Specialized Hospital)</p> |

In-depth interviews with health care providers and heads of departments of surgery showed that the number of surgeons was unbalanced, some hospitals have sufficient surgeons, but most other hospitals still have a shortage.

In general, the comments gained from the interviews suggested that the quality of surgeons was

good and their abilities met with the requirements for medical services. Most qualified surgeons had good basic knowledge to meet professional requirements. In contrast, new-graduate surgeons had poor knowledge of specialized fields which they are working in. Their attitude, and professional skills were good, however, their management skills should be improved.

Qualifier box 2. Needs for surgical workforce

| | District general hospital | Provincial general hospital | Specialized hospital |
|-------------------------|---|--|--|
| The number of surgeons | <p><i>"It is expected for the next 2 years, 4 doctor specialists I will be needed...They also need specialized training"</i></p> <p>(Male, 42 years old, vice head of department at district hospital)</p> | <p><i>"In the next two years, we will double the current number of doctors (additional 40 doctors). About 80% of them will be trained as doctor specialist I, specialist II."</i></p> <p>(Male, 49 years old, Head of Department of Provincial Hospital)</p> | <p><i>"The needs for health workforce in next 5 years is 3 doctors specialist II, 2 resident doctors, and 5 doctors specialist I."</i></p> <p>(Male, 37 years old, Head of Department of Specialty Hospital)</p> |
| The quality of surgeons | <p><i>"Our expectations always are well-trained, professional doctors... Now, I expect that doctors can access high-quality services."</i></p> <p>(Male, 51 years old, Head of District Health Center Medical Professional Division)</p> <p><i>"Doctors need to join the continued training in some specialized fields (orthopedics, urology), and techniques that hospitals have not yet met. Doctor specialists I and II need to acquire new knowledge that has been deployed in other hospitals, for example, laparoscopic surgery, vertebral kyphoplasty, and vertebroplasty, etc. Technical skills are updated through a hands-on training course, to update expertise as quickly as possible. The attitude needs to be a willingness to learn new things"</i></p> <p>(Male, 41 years old, Dean of District Health Center)</p> | <p><i>"We need more surgeons in 3 specialties: orthopedics, urological surgery, and gastroenterological surgery".</i></p> <p>(Male, 53 years old, Deputy Head of the Department of Provincial Hospital)</p> <p><i>"Sometimes, the surgeon's ability depends on facilities, in general, it must be synchronized, ..."</i></p> <p>(Male, 61 years old, Leader of the Provincial Department of Health)</p> <p><i>"We need advanced techniques and the experts to standardize technology, and bring the best services to people"</i> (Female, 38 years old, Head of Department of Provincial Hospital)</p> <p><i>"Young doctors need to practice more soft skills such as organizing, management, and communication skills"</i></p> <p>(Female, 48 years old, Leader of a provincial hospital)</p> <p><i>"Scientific research needs to be improved. Surgeon needs to write down and present in scientific conferences"</i> (Male, 54 years old, Head of Department of Provincial Hospital)</p> | <p><i>"We need to be trained in specialized knowledge (ultrasonography, laparoscopic surgery, and endoscopic surgery"</i></p> <p>(Male, 36 years old, Vice Head of Department of Specialized Hospital)</p> |

Regarding the need for health workforce, some hospital leaders said that it was necessary to increase the number of surgeons, even to double the current number. Regarding quality, most of the hospital leaders and the head of the Department of Surgery said that it is necessary to improve professional qualifications. Some comments strongly mentioned the needs for specialized knowledge in surgery, well identified according to the specialist doctor I and II. In addition, local leaders also illustrated that synchronization is needed between factors such as equipment, facilities, and staff ability. Some comments from provincial hospital leaders showed the need for management skills, communication, and research skills.

Discussions

The current situation of specialists surgical workforce between 2020 and 2021 in 7 provinces representing for 7 ecoregions across the country were 541 and 546 surgeons. The largest number of surgeons in two regions are the Red River Delta (22.7% and 22.3%) and the South-Central Coast (21.3% and 23.3%). Well understood because the representative of the Red River Delta region and the South-Central Coast region were Hanoi and Da Nang cities. These were 2 out of 5 largest population cities in Vietnam with many large hospitals. Besides, due to the rapid population growth, urbanization increases the number of accidents, especially road traffic accidents.

Fully trained surgeons and anesthesiologists represent only a small percentage of the health workforce. In the Middle East, Southeast Asia, and Africa, the number of health workers per 1,000 people is well below the minimum limit of the World Health Organization (WHO).⁴ In many countries in Africa, for example, Tanzania and Ethiopia, there are only about 0.6 surgeons per 100,000 population, while the numbers in the United States and Canada are 51 and 26 surgeons per 100,000 population, respectively.⁵

For in-depth interviews with the health care

provider and head of the department of surgery showed that the number of surgeons was not balanced. The quality of surgeons was good and their abilities met with the requirements of the medical services. Most qualified surgeons had good basic knowledge to meet professional requirements. In contrast, new-graduate doctors had poor knowledge on specialized field which they are working in. They had a good attitude, and professional skills, but their management skills needs to be improved. However, the qualified surgeons mainly work at tertiary and provincial general hospitals. The percentage of surgeons working in provincial hospitals was 81.1% and 80.2% in 2020 and 2021, respectively.

The need for specialists surgical workforce in 7 ecoregions in 2022 was 458 surgeons, but by 2025 it will increase up to 582 surgeons. The regions with the highest needs were the South-Central Coast (30.2%), followed by the North Central (22.5%) and the Red River Delta (22.7%). While other ecoregions have lower rates. The need for surgeons in provincial hospitals from 2022 to 2025 is very large (75.4% - 78.4%). The study results were similar to a labor statistic of America, whereby the number of jobs for physicians and surgeons in the United States was estimated at 727,000 jobs.⁷ The needs for physicians and surgeons in the United States is expected to increase about 3% by 2030. Even so, there will be an average of 22,700 new jobs per year over the next decade. Most of this employment comes from the need to replace the health workforce, who are transitioning to other jobs or, retirement.⁷ In terms of quality, most of the boards of directors of the hospitals believe that improving professional qualifications is necessary and synchronization is needed between factors such as equipment, facilities, and staff ability.

Conclusions

The current situation and need for surgical workforce for a period of 2020-2025 were highest in the Coastal and South-Central regions and the Red River delta. The Central Highlands region had the

lowest need for 2025. Most of the surgeons work in provincial general hospitals, followed by specialized hospitals and district general hospitals. Provincial general hospitals have the highest demand for health workforce compared to the others.

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Conflict of interest: The authors declare that they have no conflict of interest.

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