Human Resources for Cardiovascular Disease Management in Nepal: A National Need Assessment

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ABSTRACT

Background

Human resources are the mainstay of the healthcare system. Higher numbers of health workers have better healthcare coverage and outcomes. Availability of trained human resources to address the exponential rise in cardiovascular disease in Nepal is a national concern.

Objective

To assess the need of human resources for cardiovascular disease management in Nepal.

Method

We conducted an exploratory sequential mixed-method study. We developed a task force and organized a national workshop to engage stakeholders and collect feedback on the research process. We did a desk review and conducted 24 key informant interviews. We did thematic analysis from the codes generated.

Result

There is no clear definition and required estimation of health workers for cardiovascular disease management. There is a shortage of health workers with 8.9 doctors, 20.8 nurses, 0.05 cardiologist/cardiac surgeon, 4.2 pharmacist, 10.2 laboratory technicians per 10,000 population. There is a comprehensive human resource plan but it does not provide details of human resources for cardiovascular disease management. There is a lack of public private collaboration for human resource management. However, there is production of human resources for cardiovascular disease management through pre-service specialized courses and in-service training.

Conclusion

A clear definition and estimation of health workers with stringent human resource plan for cardiovascular disease management is essential. The government can still address these gaps by establishing a well-equipped central health workforce unit and expanding collaboration with private sectors.

KEY WORDS

Cardiovascular diseases, Human Resource for health, National need assessment, Nepal

INTRODUCTION

Human resource for health (HRH) is the cornerstone of a healthcare delivery system. It includes clinical and non-clinical health professionals, who provide direct and indirect healthcare services.[1] Proper utilization of HRH is a prerequisite for better functioning of a healthcare system.[2] Evidence shows that healthcare system with higher health workers and population ratio have better healthcare coverage and health outcomes.[3-6] United Nations General Assembly has reaffirmed the availability of adequate, skilled, well-trained and motivated workforce is essential to accelerate a nation's progress towards universal health coverage (UHC).[7] World Health Organization (WHO) has recommended 44.5 skilled health workers (physicians and nurses/midwives) per 10,000 population to meet one of the Sustainable Development Goals (SDG) of reducing one third of premature mortality attributed by non-communicable diseases including cardiovascular disease (CVD).[8,9] The Universal Health Coverage (UHC) targets to provide people centered integrated health services including CVD management through sufficient capacity of well-trained health workers.[10]

The national report on burden of disease in Nepal shows two-thirds of national deaths due to Non-Communicable Diseases (NCDs). Ischemic heart disease accounts for 16.4% of total deaths.[11,12] The CVD mortality rate raised from 124.1 (UI 142.8-108.1) to 164.7 (UI 185.5-142.7) per 100,000 population from 1990 to 2017.[13] The exponential rise in CVDs in Nepal has created a great concern regarding availability of trained HR to address the problem of CVDs. Inadequate human resource and unequal geographical distribution of available HRH to cater the increased need for CVDs are major challenges for Nepalese healthcare system.[2,14,15] Apparently, we couldn't locate any evidence that has analyzed the existing HRH need assessment or allocated any standard threshold of health workers for CVD management in Nepal.

Thus, the objective of this study is to critically analyze the needs of Human Resource for CVD management within Nepal's health system. This study will be an evidence for policy makers and stakeholders to develop evidence based HRH strategies to mitigate the potential impacts of emerging CVD burden.

METHODS

Assessment team

This study is a component of "Translational Research Capacity Building Initiative to address Cardiovascular Diseases in Nepal", a four-year research grant from National Heart, Lung, and Blood Institute, USA. Initially we formed a national level task force to coordinate and steer the overall assessment process co-chaired by the Dean of Kathmandu University School of Medical Sciences (Principal Investigator) and executive chairperson of Nepal Health Research Council (NHRC). The members include: co-directors of the project from Dhulikhel Hospital Kathmandu University Hospital; Representatives from Policy Planning and Monitoring Division (PPMD) Health Coordination Division, Ministry of Health and Population (MoHP), Non-communicable Disease and Mental Health Section, Epidemiology and Disease Control Division (EDCD), Department of Health Services, Nepal Heart foundation, patient representatives, FCHVs representatives, representatives of primary care health workers and co-investigators of Translational Research Capacity Building Initiative in Low Middle-Income Countries (TREIN), Nepal.

Along with the task force, we formed a research team consisting of mentors, research fellows, and technical working group members. The task force applied the 7Ps framework (Patients and the Public, Providers, Purchasers, Payers, Public Policy Makers and Policy Advocates, Product Makers and the Principal Investigators) to identify the stakeholders. Two small group meetings and one large group workshop were organized to engage the stakeholder in planning the national need assessment and receive feedback in the research methodology.[16] We selected 24 key informants from various governmental and non-governmental organizations. The key informants are enlisted in Table 1.

Table 1. List of key informants/representatives for KII

S. N.	Representatives [numbers of Key Informants]
1	Representatives of Policy Planning and Monitoring Division (PPMD), Health Coordination Division, Quality Monitoring and Regulation Division of Ministry of Health and Population (MoHP)[5].
2	Representatives of Kathmandu University, Tribhuvan University, Patan Academy of Health Sciences, National Academy of Medical Sciences[4].
3	Representative of National Health Training Center (NHTC), Cardiac Society of Nepal[3].
4	Representatives of Nepal Medical Council, Nepal Nursing Council, Nepal Health Professional Council [3].
5	Representative of Shahid Memorial National Heart Center Gangalal Hospital, Manmohan Cardio-thoracic and Vascular Surgery, Norvic International Hospital [9].

Data collection tool

We adopted the widely used United States Agency for International Development (USAID) manual "Health System Assessment Approach: A How-To manual", Version 2.0 (HSAA) for HRH need assessment.[1] The HSAA comprises 6 building blocks for the health system assessment. HRH is one of those building blocks, which includes 7 topical areas and 26 indicators.[1] We also developed a semi structured questionnaire in Nepali version to interview key informants.

Data Collection

We performed a comprehensive desk review and conducted Key Informant Interviews (KIIs). We also tallied new updates

and the available information with KII. The documents used for desk review with its purpose are presented in Table 2. After the desk review, we developed the first draft of a semi structured questionnaire and finalized it through group review, group discussion and weekly online meetings. We carried out pretesting and modified the question as needed. We identified key informants and continued their enrollment until data saturation was achieved.[17] The data was collected from June-July 2019.

Table 2. List of documents reviewed with its purpose

List of documents/ websites	Purpose of review
Status of Health Workforce in Nepal: 14 HRH indicator monitoring report.[18]	To estimate the ratio of Cardiologist, cardiac surgeons, nurses, and other healthcare workers on the basis of population, cadre, national and sub-national distribution
Specialist Registered Doctors till 2020 (Nepal Medical Council (NMC), 2020).[19]	To identify the registered specialized doctors (Cardiologist/ Cardiac Surgeons)
Nepal Health Sector Strategy 2015-2020.[20]	
Human Resources for Health Strategic Plan 2011-2015.[6]	To review the strategic plan and identify the mechanisms of HRH management in the country.
Nepal National Health Account 2012/13 -2015/16.[21]	To assess the HRH budget plan, its projection towards HRH and cardiovascular diseases.
Budget analysis of MoHP FY 2018/19.[22]	
Health Service Act 1997.[23]	To identify the existence of national acts and regulation that enables the working environment for the health care workers.
Health worker and Health Institution security Act 2010.[24]	
Public health service act 2018.[25]	To review up-to-date HRH policies, identify the job description of different health care workers and to find out the code of conduct of different healthcare workers.
Job description of employees, DoHS, MoHP 1997	
Public Service Commission Act 2010.[26]	
Salary scale of government healthcare workers in Nepal 2019.[27]	To identify the payscale of the health care workers of different levels.

Ethical consideration

We received ethical approval from NHRC. We informed the key informants and took appointments for their participation in the study. We explained the objectives of our study, and assured the confidentiality of the information provided. We assured them that the data will be used for the research purpose only. Informed written and verbal consent for interview and consents for audio recording and note taking was obtained beforehand.

Data analysis

We collected and organized the data obtained from the desk review in a folder with a particular name. We extracted essential information based on the specific indicator of HRH need assessment. We applied thematic analysis for interpreting qualitative data. The research team transcribed the coded audio record, tallied the note taken during the interview and developed a transcript. Two researchers thoroughly read and coded each transcript separately and generated a code book with different codes. We assessed and analyzed the codes developed by different coders, and the inter-coder agreement was 86.63%. We developed, defined and reviewed the themes for any mistakes or missing themes. We organized the codes into a strength, weakness, opportunities and threats (SWOT) analysis table for each topical area.

RESULTS

We organized our findings based on 7 topical areas and 26 indicators of HRH building blocks. Out of 24 key informants, 37.5% were female. Majority of participants were qualified with masters level and above. The median age of the participants was 47 years and median years of working experience was 20 years.

Current HRH Situation

The doctors and nurses ratio per 10000 population is 8.9 and 20.8 respectively.[18] By the end of 2020, 144 doctors specialized in cardiology and cardiac surgery were registered in Nepal Medical Council i.e. 0.05 per 10000 population.[19] There are insufficient cardiologists and cardiac surgeons in Nepal requiring more to alleviate the increasing burden of CVD.

"I think we have about one cardiac surgeon for probably 50 to 70 thousand people.... well if you look at the number of cardiologists there should probably be about at least 1 cardiologist per 5000 to 10,000 population.... we have 1 cardiac surgeon per million population. So we had to break that down to 1 cardiac surgeon per 100 thousand,.... we will need another probably 300 you know altogether". (Representative from Cardiac Society of Nepal)

The health workers' density is the highest in Bagmati province (13.49 per 10,000 population) and the lowest in Karnali Province (1.25 per 10000 population) as shown in Table 3, but information on the distribution of cardiologist/ cardiac surgeons is not available.[18] Similarly, there is no updated data describing the HRH distribution based on different sectors or ecological regions after federalization.

Human Resources for Health Management (HRM) Systems

Current health care system has been divided into: Federal, Provincial and Local level. There are two sections under different divisions of MoHP. The Personnel administrative section under Administration division- for transfer, promotion and recruitment; and the Medical Services, Education and Research section under Policy, Planning and Monitoring division - for academics and in-service

Table 3. **Registered Health professionals' density distribution based on provinces per 10000 population***

Provinces	Provincial Population	Doctor Population Ratio	Nurse Population Ratio	Ayurvedic HWs Population Ratio	Pharmacist Population Ratio	HealthLab Professional Population Ratio	Total Health worker population	Total Health worker population ratio
Province 1	4,534,943	4.55	22.18	1.02	3.46	8.17	17859	6.74
Province 2	5,404,145	5.83	6.82	2.66	2.34	6.22	12900	4.87
Bagmati	5,529,452	15.77	34.43	0.79	5.56	8.09	35742	13.49
Gandaki	2,403,757	8.49	37.43	1.9	7.15	10.78	15805	5.97
Lumbini	4,499,272	4.68	19.29	1.62	3.52	7.9	16652	6.28
Karnali	1,570,418	1.28	7.73	1.03	1.72	9.34	3314	1.25
Sudurpaschim	2552517	1.72	6.26	1.39	2.48	6.80	4760	1.79

training. These two sections work collaboratively for HRH management.[16] The HRH focal point is active under the Health Coordination Division of MoHP to coordinate the HRH related policy activities. The Human Resource Information System (HuRIS) and Department of Civil Personnel Records (DoCPR) manages HRH information of the public sector. The government has initiated Nepal Health workforce Registry (NHWR) program with the purpose of providing HRH information.[18] However, there is no central unit or mechanism to regularly update and manage HRH information of both public and private sectors.

There is an Annual Performance Evaluation mechanism to appraise health workers annually in the public sector, which should be stringent. Meanwhile, the private hospitals have regular supervision and monitoring by the supervisor and directors of the hospital.

"....there exists a mechanism, But sometimes there arise questions on transparency... Those who are near to their boss/senior, they get high scores even when they don't perform well and get benefits. This is not the problem of the tool but the problem of the person who implements it". (Representative form MoHP)

The HRH posts are expected to be created on the basis of regular organization and management (O and M) surveys but it has not been conducted for many years.

"...The public service commission announces the vacancy for the post, which is to be created by O and M surveys.... but, the survey has not been done for the past 20 years". (Representative from MoHP)

There is no CVDs specific HRH plan and the government still uses the old HRH strategic plan 2011-2015 as a guideline. Government is in the process of developing a new HRH strategic roadmap 2030.[28] However, the government can utilize the largely produced middle level health workers like community health nurses, school health nurse, Certified Medical Assistant (CMA), Auxiliary Nurse Midwife (ANM), Health Assistant (HA) through task shifting in the prevention of CVDs. Those middle level health workers can conduct awareness, screening programs and also deliver health services for postoperative cardiac patients at the periphery.

"..Well if you're talking about cardiology, then task shifting will probably be practical but when we are talking about ....cardiac surgery, they do not do so. But... What cardiac surgery can probably benefit from is community nursing.... people who have undergone valve replacement and have to check International Normalized Ratio (INR) every month.. But every patient cannot afford to come to Gangalal or kathmandu. In such a case, if the government can at least provide a sort of INR checking center... at least at a district level, then that will decrease the cost of travel and stay for the patient... because they may have to spend between 1000 to 10,000 rupees just to get an INR which cost 150 rupees at Gangalal... It's not economically sensible... and another thing is... we can establish a mechanism to do strep throat check at every school. It doesn't have to be a doctor. It could be you know... even a trained medical auxiliary nursing midwife or health assistant or a community nurse isn't it?" (Representative from Manmohan Cardiothoracic Vascular and Transplant Center)

Policy and Planning of HRH

The HRH strategic plan (2011-2015) is guided by different health plans and policies. The Health Service act (1997) directs to fulfill the vacant posts, transfer and deputation; study and training; entitlement of earned salary, allowance and retirement for HRH.[23] Second Long Term Heath Pan (SLTHP 1997-2017) provides the appropriate numbers, distribution and types of technically competent and socially responsible health personnel required.[29]

Financing of HRH

The government annually announces the budget based on the annual work plan of MoHP. The Annual work plan contains salaries allocated for the health workers according to their level but not according to the cadre, which is updated regularly as per the policy of the country. The total salary for the health workers ranges from Rs. 25,970 to Rs 64,726 ($242.7 to $604.9) ($1= Rs.107) including the allowance for their grade 27 but there is no provision of performance based incentives or financial security, which is one of the reason that most of the skilled doctors are not interested to choose cardiac surgery as their profession.

"He really wanted to join cardiac surgery, yes? But unfortunately, for a cardiac surgeon he decided to follow neurology. …the formula is very simple, there is no financial security in cardiac surgery that gives him during neurology work. ... The most basic reward of skill is financial, financial gain". (Representative from Cardiac Society of Nepal)

Based on Budget of the Fiscal Year (FY) 2018/19, Ministry of Health and Population (MoHP) allocated 1.6 NPR Million (USD $14,950.9) budget for the Wages and Salaries of health workers at the Federal level in the year 2017/18 for all health workers in the country and 78.9% of it was spent. Seventy three percent of the expenditure was for capacity building of health workers conclusively.[22] However, it is high time to provide performance based payment to motivate and retain the health workers in the country.

Education and Training

There are total 26 medical and dental colleges, 240 nursing colleges, 22 ayurvedic colleges, 19 Bachelors in Pharmacy, and 29 Diploma in Pharmacy Colleges in Nepal.[18,19,29] Medical universities include the topics related to CVDs as a basic course in the curriculum.

"For cardiovascular diseases, we have included courses like cardiopulmonary resuscitation in basic courses. They are our mandatory courses... and courses which are according to your subject of interest. For example, for cardiologists we can do these courses in cardiovascular." (Representative from Nepal Medical Council)

The universities form a committee including graduates, professors and representatives from ministry and other universities as members to develop and regularly update the curriculum.

"We develop one education committee in which we take feedback from the batched out student on a regular basis". ... We also include two experts from other subject areas... and experts from outside our institution." (Representatives from IOM)

The MoHP and different professional councils set minimal standard criteria for accrediting training institutions. The government has established provincial health training centers at each provinces and has developed the policy of one health academy in each province to increase the quality production of HRH.[30,31]

National Health Training Center (NHTC) provides 108 types of training and there is only one training related to CVDs - Package of Essential and Non-Communicable Disease (PEN), which train the health workers at different levels of healthcare center for the prevention and management of non-communicable diseases.[32]

Partnerships in HRH

The Government of Nepal coordinates with the National Planning Commission (NPC), academic institutions, professional councils, and international organizations for producing, recruiting, deploying and capacity building of health workers. But there are not any formal agreements or mechanisms between the government and the private sectors for partnership regarding HRH management for CVD.

"We first coordinate with the National Planning Commission..... parallelly, we collaborate with academics…. established under MoHP and other public universities, ... thereafter councils….. we need to coordinate with private sectors also but they are being left out because we don't have a formal mechanism for the partnership with the private sector". (Representative from MoHP)

HRH Leadership

The MoHP controls the HRH management across the country. Nevertheless, the local government also can recruit HR based on the needs of the healthcare centers. The health workers in the public sector are highly competent.

"We proudly say that one of the strengths of our mechanism is that those who enter the public health sector have to face tough competition and are very competitive.." (Representative of MoHP).

"...on the whole if you look at general cardiac surgical services I think … the doctors here are trained well enough to handle cardiac cases.." (Representative of Manmohan Cardio-thoracic and Vascular Surgery)

However, the existing brain and skills drain in the country is one of the big challenges for HRH management with.[31] The government is gradually addressing by planning an updated HRH strategic roadmap and also have established HRH registry system.[18,30]

SWOT Analysis

Strength	Weakness
A : Current HRH situation	A : Current HRH situation
Qualified and competent cardiologists, cardiac surgeons, nurses and other health workers are available at the central hospitals.	Great shortage of cardiologists and cardiac surgeons as well as other health workers in the country.
B : HRH management systems	B : HRH management systems
Re-establishment of health systems in the federal context; availability of comprehensive HRH strategic plan, national health policy, job description, performance evaluation mechanism for HRH management.	HRH plan are not specific to CVD management; Irregularities in organization and management Survey; biases in performance evaluation of staff; poor working environment due to lack of appropriate physical infrastructure, equipment and supplies for specialized CVD services in remote areas; Significant imbalance between the production and absorption of human resources; underutilization of specialized nurses (Master degree and Bachelor in ICU/CCU trained nurses) and middle level health workers.
C : Policy and planning of HRH	C : Policy and planning of HRH

Existence of policies, acts and strategies regarding HRH management; Existence of ethical guidelines and scopes of practice.	Poor implementation of formulated policies; most of the policies are made in a blanket approach, lack of utilization of available information, lack of precise HRH policies to address CVD.
D : Financing HRH	D : Financing HRH
Presence of guidelines for staff salaries, incentives and benefits; regularly report budget analysis by National Health Accounts (NHA); budget allocated for HRH under different sections.	Government does not have performance based payment policies for health workers; Same payment for technical and administrative workers.
E : Education and training HRH	E : Educating and training HRH
Adequate numbers of health institutions at central level; existence of robust and regular curriculum updates; availability of pre-service specialized courses on CVDs; exist mechanism to evaluate quality of health institutions and health workers through respective councils; developed PEN package training to address NCDs including CVDs, training are accessible to health workers from all sectors	Insufficient CVD training packages.
F : Partnership in HRH	F : Partnership in HRH
Partnership with national and international health institutions of public sector for production, capacity building of HRH; deployment of sponsored HRH in remote healthcare centers through public partnership.	Lack of a partnership with private sectors to manage HRH for CVDs
G : Leadership of entire HRH system	G : Leadership of entire HRH system
Established HR registry program; participates in regular consultative meetings to develop updated HRH strategic roadmap.	Lack of implementation of some plans and policies; lack of public private partnership; lack of utilization of produced HRH; poor monitoring and evaluation of organization and management survey for HRH management.
Opportunities	**Threats**
A : Current HRH situation	A : Current HRH situation
Utilization of mid-level health workers and specialized nurses in prevention and management of CVDs.	Retention of health workers is challenging especially among nurses.
B : HRH management systems	B : HRH management systems
Development of a central unit to regularly update and manage HRH information; regular monitoring of the operation of organization and management surveys to sanction need based posts at healthcare facilities	Lack of updated HRH strategic plans and policies
C : Policy and planning of HRH	C : Policy and planning of HRH
Develop evidenced based and epidemiology based HRH strategies.	Difficult in controlling the partners with vested or political interest; political influence in the planning and functioning of the healthcare system
D: Financing HRH	D : Financing HRH
Adequate utilization of allocated budget; performance based payment to attract and retain HRH.	Low payment; lack of performance based payment.
E : Educating and training HRH	E : Educating and training HRH
Develop CVD focused short term courses and training packages for task shifting; introduce nurse practitioner concept regarding CVD to mobilize HR at remote areas by developing super specialized courses; collaborate with national cardiac centers to produce skilled cardiologists, cardiac surgeons and cardiac nurses.	Political influence in quality control of the educational institutions
F : Partnership in HRH	F : Partnership in HRH
Establish formal mechanisms for the partnership with the private sector regarding HRH management.	Lack of mechanism to collaborate with private sectors for HRH management to address CVD.
G : Leadership of entire HRH system	G : Leadership of entire HRH system
Endorse an updated HRH strategic plan; extend collaboration with the private sector for HRH management.	Difficulty in implementing the HRH strategy in private sectors.

DISCUSSION

World Health Report (2006) defines HRH as "all people engaged in actions whose primary intent is to enhance health. It includes not only the technical teams that diagnose and treat disease but also those who make the health system functioning but do not provide direct health services".[1] There is no clear definition of Cardiovascular health workers in Nepal, therefore there is still confusion who can be addressed as the cardiovascular health workers and how to estimate the exact density of cardiovascular health workers in Nepal. We found a critical shortage of health workers in Nepal considering the standard ratio of doctors and nurses to the population set by the WHO (10 doctors and 40 nurses per 10,000 population).[33,34] Moreover, there is insufficient number of cardiologists and cardiac surgeons in Nepal. The government of Nepal is still recruiting health workers based on the first national health policy formulated in 1991 AD.

Although there is some data available about the health workers, the current HRH data is solely based on the registry of health workers in their respective professional councils (Nepal Medical Council, Nepal Nursing Council, Nepal Health Professional Council and Nepal Pharmacy Council) which lack regular updates of the information such as: their current job status, working sector (public/private), ecological and provincial distribution, current practice area or left practicing because of migration or further education etc.[18] Hence, the available data could be either underestimated or overestimated. Thus, it is high time for the government of Nepal to establish and strengthen a HRH unit that collaborates with the respective professional councils to develop an updated central HRH database, which can facilitate in developing evidence based HRH strategic plans.

Nepal has very sound acts, plans and policies which guide the HRH management but most of them does not consider the distribution of population, epidemiology, resources availability, skills, performance, workload, payment of health workers etc. In addition, political influence on the responsibility and accountability of the health workers at different levels of the healthcare system is further weakening the implementation part. Lack of regular conducting organization and management surveys, which determine the numbers of health workers required for the smooth functioning of an organization have led to shortage of overall HRH in health care facilities. Thus, the government should focus on regular monitoring and evaluation to identify the challenges and potential solutions to develop and implement evidence- based HRH management policies.

The national academic institutes in collaboration with the government are producing and deploying competent health workers with specialization. However, the partnership has not turned out to be beneficial due to unclear roles and responsibilities of the graduates.[30] Besides this, poor working environment due to lack of well-equipped facilities and infrastructures and inadequate equipment and supplies have disabled health workers to provide specialized health care services and also leading to the lack of retention of health workers in the remote areas. This has created a great mismatch in production and absorption of health workers as well as imbalance in specialized health care delivery and its utility for CVD. Thus, the government should prioritize providing a suitable working environment with adequate resources and infrastructures for health workers to also deliver specialized healthcare services efficiently to reduce the emerging burden of disease like CVD.

Despite having collaboration with different national institutes and establishing provincial training centers to produce competent health workers, there is still a great shortage of cardiologists and cardiac surgeons. The government still lacks a formal mechanism of partnership to include all the private sector at one platform. The government can enhance its leadership role through partnership with super specialized healthcare centers like Shahid Gangalal National Heart Center to produce urgently required HRH for prevention and management of CVDs. Meanwhile the government can also mobilize the abundantly available middle level HRH including Auxiliary Nurse Midwife (ANM), staff nurse and subject specialized nurse (Community health nurse, Adult health nurse, ICU/CCU nurse etc.) to provide preventive, curative and rehabilitative health services in remote areas of the country. This will reduce the cost of treatment and follow up while travelling to central hospital from the periphery and to some extent decrease the emotional or psychological burden to the patient and their families, which may occur due to the financial burden. In addition, it will also facilitate the decentralization of CVDs services too at the periphery.

This limitation of the study is that, we could only calculate the ratio of cardiologist and cardiac surgeons per population as there is no clear definition of CVDs health workers. However, any disease management is a team work, and it includes all the technical and non-technical workers who provide direct and indirect health services. Thus, it might have unrepresented the ratio of CVD health workers due to lack of its definition.

The data of density of health workers at sub-national level is based on the registry of respective professional councils at their entry period rather than their current working areas, which means it is not updated. In addition, the government scholarship scheme has attracted scholars to practice in the periphery of the country also. Thus, the data presented might have underestimated or overestimated the distribution of health workers in different provinces.

CONCLUSION

We don't have a clear definition of CVDs health workers. We have an extreme shortage of cardiologists and cardiac surgeons along with other health workers. There is a significant imbalance in production, absorption and distribution of health workers across the country. We found that the HRH information is not updated and hence a better and timely update of HRH information would help evidence-based HRH planning. The government can still address these gaps by establishing a well-equipped central health workforce unit and expanding collaboration with private sectors. Meanwhile, task shifting among the available pool of health workers through CVDs training can alleviate the shortage of HRH to address CVDs at primary level of healthcare services.

Disclaimer

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