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Understanding and Managing Shortages
Healthcare and Project Management
Series Article   by Dr. Deepa Bhide

Healthcare and Project Management[1]

Understanding and Managing Shortages in the Healthcare Industry [2]

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Abstract

Healthcare worldwide is only as good as its resources, especially in the healthcare industry. Shortage of the healthcare workforce poses a risk to achieving healthcare goals at all levels, global or national. According to the World Health Organization[1] (WHO), there is an estimated shortfall of 10 million health workers by 2030, mostly in low- and lower-middle-income countries. Besides the workforce, a shortage of life-saving equipment, infrastructure, and medications also contribute to the failure to meet healthcare goals. In addition, healthcare emergencies such as Covid-19 posed unprecedented challenges to healthcare infrastructure, exposing gaps in public health. Regardless of the reasons and magnitude of shortages, the implications on the healthcare industry are invariably adverse.

Mitigation strategies for the shortage problem can range from a short-term initiative to plug the leak to creating a long-term plan to ensure the scalability and sustainability of the processes. In addition, solving healthcare shortages needs a concerted effort from various stakeholders, notably international, national, and local bodies. This article focuses on crucial facets of healthcare shortages, especially critical needs and risk management strategies to mitigate the situation.

Mary: Good morning, doctor. The past two conversations on the nuances of healthcare as an industry and the universe of projects in the healthcare industry have been very insightful. I particularly liked the stress on patient-centric projects that you mentioned. I am now looking at some specific topics that we can talk about.

Author: Good morning, Mary. I look forward to our discussions too. The last two conversations covered good ground from industry and healthcare projects. As we cover the upcoming topics, I request that you recall those conversations.

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[1] Editor's note: This is the third in a series of articles about project management in healthcare by Dr. Deepa Bhide, a practicing pediatrician with additional experience in information technology and project management. She has recently experienced healthcare from a patient's perspective while recovering from a broken ankle. In this series, Dr. Bhide will reflect on programs, projects and project management in all aspects of healthcare from industry, provider and human patient perspectives. Learn more about Dr. Bhide in her author profile at the end of this article.

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Mary: Sure. In our last conversation, you mentioned new project initiation. Am I correct in assuming that the healthcare industry has sufficient resources to execute them, given the speed and magnitude at which these projects are being created?

Author: Unfortunately, that's not the case. The healthcare industry faces many shortages on multiple dimensions. Let's focus on this topic today.

Key terms: care delivery; healthcare workforce; shortage; non-human resources; mitigation; risk management

Overview

Healthcare shortages can be classified in many ways. Majorly shortages can be classified as human and non-human resource-related shortages.

1. Human resources, such as the healthcare workforce categories mentioned below. Based on the International Standard Classification of Occupations (ISCO - 08)[2], the following is a classification of the healthcare workforce.
   - Doctors
   - Nurses and midwifery
   - Dentists and pharmacists
   - Environmental and occupational health and hygiene staff
   - Medical and pathology assistants; physiotherapists
   - Traditional and complementary medicine professionals; community health workers

Nurses and physicians make up the most significant section of the healthcare workforce. According to the U. S. Bureau of Labor Statistics[3] projects, there is a need for more than 275,000 additional nurses from 2020 to 2030. The Association of American Medical Colleges (AAMC), in their 2021 report, predicts a shortage between 37,800 and 124,000 physicians by 2034, which could include a lack of primary care and specialty physicians.

Similar shortfalls exist in other categories of the healthcare workforce. More details of workforce shortages are available at the following link from WHO - The National Health Workforce Accounts database, World Health Organization, Geneva[4].

https://www.who.int/data/gho/data/indicators/indicator-details/GHO/nursing-and-midwifery-personnel-(per-10-000-population)

2. Non-human resources such as healthcare infrastructure (hospitals, clinics, nursing homes, community health centers, laboratories, and so on), medications (including life-saving drugs), supplies such as oxygen cylinders and ventilators, laboratory, and personal protective equipment (PPE), sanitizers, medical prosthetics and so on.

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Mary: Yes. Knowing that this crucial industry faces shortages isn't reassuring. I am sure this impacts the well-being of the global population and international and national goals for the health.

Author: That's true. Healthcare goals are at the family, community, State, and national levels. Global healthcare goals drive healthcare goals at a national level. For example, 191 UN Member States agreed to achieve the United Nations Sustainable Development Goals [5](SDGs), which comprised 17 goals with about 169 targets. SDG:3, Ensuring healthy lives and promoting well-being, is dedicated to health with 13 targets. More details on SDGs are available at https://www.un.org/sustainabledevelopment/health/. For example, as per health.gov[6], an information resource from the US government on health-related resources and news, the overarching goals of "Healthy People 2020" and its ambitious 10-year agenda for improving the health of the country are around attaining health quality, health equity, promoting good health in all spheres such as physical and behavioral health. I request you to check the website to get an idea of the objectives that healthcare as an industry is trying to achieve.

As I had mentioned in our conversation about the universe of projects and their classification[7], it is vital to understand the reasons for classifying projects regardless of the type of classification. Therefore, other than human and non-human resources, different categories are as follows.

Medical Specialties

- Shortages can be categorized based on medical specialties, such as primary care physicians or specialists such as mental health experts, geriatrics, etc. Getting to this level of detail is essential to plan appropriate risk mitigation.

Geographies/Regions - Covid-19 brought forth unforeseen emergencies. As reported by WHO, the demand for oxygen as a life-saving medication increased exponentially due to the increased request for the same. As a result, the oxygen crisis impacted more than half a million people, especially in the world's low- and middle-income countries, sub-Saharan Africa, Southeast Asia[8], etc.

- Shortages can also be categorized by the regions they impact. For example, the predicted shortage of nurses in low- to middle-income nations. According to the American Association of Colleges of Nursing[9] (AACN), the US is projected to experience a shortfall of Registered Nurses. In addition, it was noted that the total supply of RNs decreased by more than 100,000 from 2020 to 2021. This drop was the largest over the past four decades.

Timing/State of the process

- Shortages can be ongoing during a steady state mode or acutely felt during a health emergency such as a pandemic, other disease outbreaks such as the Ebola outbreak in Uganda in 2022, emergencies related to wars and terrorism

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(e.g., the Ukraine war), the most recent earthquake in Turkey and so on. For example, recall the vital role of sanitizers, masks, Covid-19 rapid antigen self-testing kits, medications such as remdesivir and steroids, etc. Similar situations can be seen in other healthcare emergencies, such as accidents or terrorist attacks, where blood or blood substitutes, surgical units, surgeons, and other life-saving medications play a vital role.

Global concepts

- Novel global concepts essential to the greater good of humanity and the planet are evolving continually. There is a worldwide focus on Environmental, Social, and Governance (ESG) to introspect on the ability of an industry to impact the world we live in positively. The healthcare industry though largely mission-driven may face a shortage of its workforce to support projects such as carbon emission, air, and water pollution, green energy initiatives, etc.

Mary: Oh, that's a lot. What are the reasons for such shortages? Given the importance that governments, organizations, communities, and families attach to good health, why would shortages occur?

Author: As in any other industry, shortages arise from the demand-supply gap to meet the industry's needs. The demand-supply gap causes disequilibrium in the system. Let's look at a few reasons.

Firstly, a shortage can be an actual shortage or an apparent shortage. For example, a real shortage exists where there is an insufficient supply of resources to meet the requirements of a given task, such as what the world saw during the pandemic. Apparent shortages are not real shortages. They may be "perceived" shortages. At times shortfalls are temporary, and they disappear when the situation changes. In this case, a skill gap exists between what is needed to execute the task successfully and what exists. For example, for nursing trainees, a deficiency of clinical learning in the academic and practical setting can impact their ability to perform on the job.

Of the many plausible reasons for healthcare shortages, here are a few.

- Aging population - As per the United States Census Bureau[10], all baby boomers will be 65 or older. The overall aging of the US population in the coming decades will have an increased need for healthcare services and other requirements of the aging population. The nursing population is also aging with the baby boomers. This means new nursing students must be trained by existing staff before retiring. This also means an increase in nursing school enrollments and or an increase in nursing schools. The elderly population faces physical or cognitive challenges impairing their ability to live and function independently. A generational mindset can further aggravate loneliness among families, especially among the elderly. With an aging population, there is an increased need for

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professional caregiver services and residential settings such as senior community facilities, assisted living facilities, nursing homes, etc. Policymakers need to be prepared for this deluge in healthcare resource consumption.

- Burnout of the healthcare staff - Due to work-life balance disequilibrium.

- Low wages spurring resignations - For example, staff migration to higher-income countries for improved working conditions and career opportunities.

- Insufficient nursing and medical schools/training institutes that results in an inability to meet the demand (current or future) of the healthcare workforce.

- Inaccurate prediction of workforce requirements generally happens in emergencies necessitating the healthcare workforce.

- Insufficient qualified resources to fill the skill gap. E.g., limits on migration due to governmental policies.

- Better work-life balance, flexibility, better career opportunities, and increased compensation drove the great resignation – a phenomenon with long-lasting negative implications.

Shortages of non-healthcare shortages result from incorrect demand-supply predictions. A risk related to deglobalization merits mentions here. Deglobalization is characterized by lesser global collaboration and connectivity. Deglobalization increased border controls, and overregulation of movement between nations for newer vaccines, drugs, and other healthcare-related products can hamper supply chains, producing a shortage. Deglobalizing clinical trials for new drugs can also become less representative of the global population, creating uncertainty around their safety and efficacy for new treatments.

Mary: This is a long list of the reasons for the healthcare workforce shortfall. How does this impact the healthcare industry? Of all the types and causes for shortages, can you please elaborate on the critical shortages and how they would impact healthcare projects?

Author: Regardless of the type of shortage, there is invariably a negative impact on healthcare projects. Impact on projects can be multifold at various levels of the healthcare value chain. Starting primarily from the negative impact on patient care delivery (clinical), shortages negatively impact administrative and financial processes at the hospital, community, national and global levels. A few examples are nursing shortages affecting clinical care at ambulatory set up or hospitals, drug shortages impacting patient treatment options, and staff shortages resulting in long queues for diagnostic or laboratory services.

As of 23rd January 2023, there have been 6 million deaths worldwide due to the Covid-19 pandemic. In addition, millions are dealing with the sequelae[11] of the pandemic. The pandemic has disrupted the world in many ways creating challenges for the workforce, such as psychological issues and immigration problems due to restrictions around the movement of people (a preventive measure to contain the spread of the virus). In addition, healthcare settings with high patient-to-doctor or patient-to-nurse ratios have the potential for medical errors and higher morbidity and mortality rates among patients. Project managers of such projects need to be armed with risk management strategies to forecast, assess, calculate, and mitigate such risks. I will elaborate on a few in the following paragraphs. Of all the reasons and implications thereof, critical shortages are in a league of their own. I have mentioned a few above. For example,

- Shortage of critical staff - physicians or nurses with the necessary clinical acumen. This can impact the entire value chain of patient care from inception to conclusion. We will talk about patient care as a project in our subsequent conversation. It's a separate and an essential topic to discuss.

- Shortages of life-saving supplies during an emergency - We talked about the shortfall of oxygen cylinders, medications, life-saving equipment such as ventilators, blood and blood substitutes, first-aid kit, surgical theaters, and more that challenge the lives of millions during any healthcare emergency.

- Shortages based on location aggravate its existential crisis – for example, shortage of primary health centers (healthcare infrastructure) in remote places with no proper infrastructure. According to the International Labor Organization (ILO) survey[12], rural areas are more than twice as impacted as urban areas hampering equitable access to healthcare.

- Shortage of preventive care can profoundly impact morbidity and mortality. For example, shortage of vaccines, masks, community health workforce, and infrastructure. Mandatory usage of PPE kits was a critical preventive measure for all healthcare workers to protect themselves and other patients in containing the spread of infection during the Covid-19 pandemic. Shortage of this resource made the healthcare workers risk their lives and that of others. The WHO[13], in its report in 2020, called for an increase in the production of PPE kits by 40% to meet the populations' and patients' demands.

We have seen a lot of violence in healthcare settings that increase the mental agony of the healthcare staff working there. Healthcare workers are at a high risk of violence worldwide. According to the WHO[14], 8% to 38% of healthcare workers face violence in their career span, mainly due to patients and visitors. The threat of violence negatively impacts job satisfaction and quality of work, leading to emotional and physical abuse.

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It is known that communities with sound healthcare knowledge enjoy better health. As defined by CDC[15], personal health literacy is "the degree to which individuals can find, understand, and use information and services to inform health-related decisions and actions for themselves and others." In my opinion, personal health literacy helps mitigate the already existing shortage.

Mary: How is the shortage of healthcare resources being tackled? What steps could healthcare project managers take to mitigate the risks?

Author: While there is a concerted effort at all levels, notably global, federal, public health, and community, to tide over the crisis of healthcare resources, healthcare project managers at a ground level can play a vital role in such situations. Knowledge of project management or program management is beneficial to identify some of the shortages. That may be an exciting topic to discuss in our subsequent conversations. At the global level, I am aware that a consortium of international organizations such as ILO, WHO, the CDC, and similar are working towards a plan. From a healthcare project manager's standpoint, having a sound risk management strategy is crucial in managing or having a workaround for these shortages. The goal should be to focus on non-compromising clinical care. Examples of risk management strategies are isolating identified risks to create a definitive risk response, using questionnaires and surveys from stakeholders to assess the situation, preparing oneself to tackle risks related to shortages of healthcare resources, etc. A few risk response strategies are as follows. New strategies need to get added continually. Strategies specifically for healthcare workforce shortages are as follows.

1. Using existing models (what-if scenarios) deployed in healthcare emergencies, keeping the system prepared to tackle similar situations. This can test out various responses to hazards. For example, it is strengthening the capacity of the healthcare workforce in crisis and disaster management.

2. Building buffers in the system can be another risk response strategy. Buffers keep the project within agreed-upon boundaries. Cross-training resources to meet skill gaps and indenting additional medical supplies are examples of building buffers into the system. For example, starting short-term "mini fellowships" for a particular specialty, such as geriatrics or psychiatry, may offer one solution to ensure an adequate workforce for these faculties. Of course, this applies to non-human resources too.

3. Creating a culture of empowerment to meet the expectations of the healthcare staff can motivate them, leading to less burnout and retention. This can reduce turnover while creating a skilled, experienced, and dedicated workforce. Magnet certification in healthcare settings lays the foundation of superior nursing processes and high patient safety, quality, and patient and workforce

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satisfaction. The Magnet Recognition Program[16] is a framework for healthcare organizations globally.

A few key strategies used for non-healthcare resources are as follows. The evolution and use of technology have a significant role in tackling shortages. Digital automation has helped streamline workflows, ensure remote visibility of resources, manage supply chains, and eliminate redundancies. Empowering the team with the right tools can help in increasing their productivity and efficiency.

1. Using technology such as Electronic Medical Records (EMRs) in hospitals has proved to be a boon and a bane for the shortfall. While EMRs promise to take away some of the mundane tasks from the healthcare workforce, they also minimize the need for full-time employees, thus creating a shortage of workforce that interacts with the patient. Patient care tasks cannot be completely outsourced. Telemedicine, now an integral and accepted form of physician-patient encounters, is an excellent example of the use of IT to mitigate shortages in places where expert care is unavailable.

   A recent entrant to digitization is an Open AI-based conversational language model called ChatGPT. ChatGPT promises to transform medicine in some activities such as clinical documentation, patient education, creation of clinical references, etc. A critical use case of this application to support the mitigation of shortages of healthcare professionals is its use as a medical chatbot. Medical chatbots can help with the initial triaging, provide health appointments, and respond to their questions. However, in healthcare, where every conversation can be a matter of life and death, such novice applications have severe limitations. Therefore, additional iterations need to be done for such applications to be able to be adopted by the healthcare industry.

2. Knowledge sharing is necessary to prevent reinventing the wheel and deliver objective and efficient care. Information Technology enabled reference databases, and communication methods are vital in disseminating information and sharing lessons learned and best practices lower project risks. Project teams must document findings, analyze them and devise a strategy to move forward. Sharing of best practices can reduce long-term risk.

3. Big data to guide better decision making - Data analysis and prediction support - Establishing international and national databases/registries of practicing healthcare workforce to determine the existing capacity of healthcare workers along with their skill sets.

4. Increasing healthcare infrastructure support such as medical, nursing, and allied practitioner schools, designated healthcare facilities, or alternative care sites (for example, surge hospitals).

5. Meeting the demand-supply gap of essential medical supplies by striking global partnerships and improving the supply chain, making these critical items accessible at the point of need. Newer technologies, such as 3-D printer technology, are being explored to augment the supply.
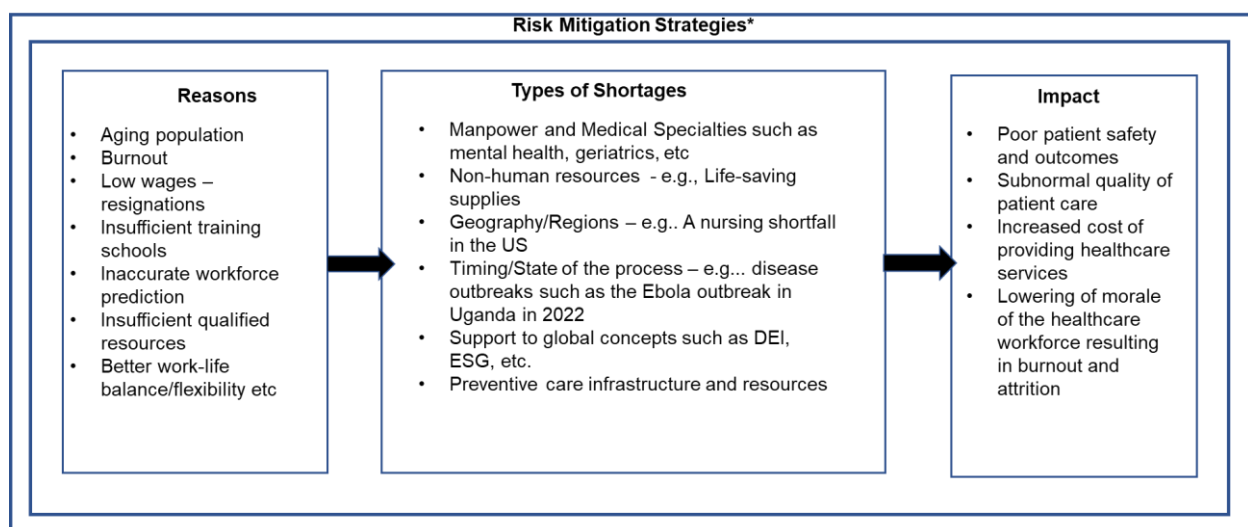
DEI: Diversity, Equity, and Inclusion
ESG: Environmental, Social, Governance
* - Details in the text

Figure 1: A conceptual representation of healthcare shortages, reasons, and impact

Mary: What should be an overarching goal to mitigate shortages? How can we make the supply chain sustainable? We discussed that it must be more in line with a healthcare emergency. Is that the only prominent context?

Author: I think at a global level, the target is to make the healthcare industry more resilient and enable it to weather crises by itself without battling shortages. Changing demographics, economization, and cost-optimization that increased during the past 30-50 years need to be reconsidered in a more contemporary light. In addition, we need to think about the ownership of healthcare. Is it an industry to make profits or a for-profit business? Or a government task supported by volunteers and non-governmental organizations (NGOs) to be able to provide healthcare for all?

Mary: I agree with you; this is a broader question. As a part of the community, what does this shortage mean to me or more like me? I wonder if these shortfalls impact the ethical grounding of the healthcare tenets. Or are they at risk of being compromised?

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Author: The first part is awareness of the shortages and your spot in the vast landscape of shortfalls. You can then judge your needs, both current and future. Next, you can create a risk mitigation plan for yourself and your family. As an example, if you see a current or upcoming need for a caregiver/nurse for any elderly family member, start getting prepared to procure the same. Finally, you bring up a good point about ethical considerations. Let's discuss it in our following conversation.

Mary: Thank you so much, doctor. I appreciate your taking the time to talk to me. I look forward to our conversation on ethical considerations in next week's session.

Conclusion

Mitigation of shortages is uniquely dealt with at all levels at which they occur. Therefore, the reasons for shortage problems are multifold. Whatever the cause and magnitude of the shortage, there is a negative impact on healthcare goals from a global to an individual level. They vary from physical/infrastructural, professional, economic, political, educational, social, cultural, geographical, and more. Therefore, healthcare shortages pose a risk to achieving healthcare goals.

Shortages will continue to remain and test our existing infrastructure. However, they must not endanger people's lives, healthcare goals, and patient-centric care. Awareness is critical to understanding the situation. Concerted efforts at all bureaucratic levels will likely help forecast and mitigate these critical shortages. Until more research is done on the root cause of such problems, having comprehensive risk management is good for business continuity and operational effectiveness.

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Glossary

AACN: American Association of Colleges of Nursing
AAMC: Association of American Medical Colleges
CDC: Centers for Disease Control
ESG: Environmental, Social, and Governance
ILO: International Labor Organization
PM: Project Management
PMBOK®: Project Management Body of Knowledge
PPE: Personal Protective Equipment
PMI: Project Management Institute
SDG: Sustainable Development Goals
UN: United Nations
WHO: World Health Organization

About the Author

Dr. Deepa Bhide

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Dr. Deepa Bhide, MBBS, DCH, PMP, has over 20 years of professional experience where she has blended medical practice and research with IT and Project Management. She juggles consulting, training, and operations and is proficient in clinical medicine, project management, and healthcare information technology. Starting her career as a medical practitioner, she has worked with varied organizations before her current stint as director and clinical expert for Inventurus Knowledge Solutions.

Deepa's growing interest and work in these areas, born from her day-to-day patient interactions, helped her view Project Management as a backbone of progressive healthcare. Her paper on "Patient Care - A Project Management Perspective" has received global recognition and acclaim. With a physician background as a solid foundation to leverage IT/PM skills and knowledge, Deepa has blended her broad-based experience and learnings to present a unified, holistic, and wholesome view of Project Management and Healthcare, a cross-domain confluence. Through various webinars, events, talks, and writings across platforms, Deepa has been an evangelist in championing global project management during the Covid-19 pandemic.

A Gold medalist from Osmania University for standing First in the MBBS course, she pursued her DCH in Pediatrics and Child health. Deepa has served a variety of roles in local and global Project Management Institute (PMI) regions. She remains actively engaged with PMI and has been a participant and speaker for various national and global meetings and online events.

Deepa lives in Hyderabad, India, and loves traveling, singing, and experimenting with global cuisine. She can be contacted at deepa.bhide@gmail.com.