NHSMUN50

National High School Model United Nations

WHA

BACKGROUND GUIDE

NHSMUN
National High School Model United Nations

Email: info@imuna.org
Phone: +1 (212) 652-9992
Web: www.nhsmun.nyc

Hi everyone,

It's my honor and privilege to welcome you to NHSMUN 2024, my name is Ivy Wilson, and I'm beyond ecstatic to be your director this year. This is my fourth year attending NHSMUN, and every year gets better and better! Overall, this will be my seventh year doing MUN, and I cannot wait to meet and learn from all of you. I currently major in public health at a community college in San Diego, but I will soon transfer to UC San Diego to graduate with my bachelor's degree in 2026. I was born and raised in Southern California, where I went to Cerritos High School (Go Dons!) before going to college in San Diego. In high school, I was a MUN delegate along with being on my cheer-dance team, so shout-out to any dancers or cheerleaders!

In my free time, I love spending time with my dog, Bean! She is a rescue pit bull, and she is my literal best friend. Additionally, I enjoy doing independent activities such as reading, doing puzzles or going on nature walks. I particularly love the outdoors, which is easy to do in sunny, hilly, environmentally diverse San Diego! Also, being from the West Coast does mean that I am obliged to be interested in surfing, which is the only professional sport I follow. I love to garden, which was a new hobby I picked up during the summer. At the time of writing this, I currently have basil, daisies and sunflowers that sprouted successfully in my garden. However, I am definitely making plans to expand, so definitely ask about my garden when we meet in person!

In addition to being a full-time student, I work as a pharmacy technician, and it's this work experience that makes me so passionate about increasing access to assistive technology. Whether it's elderly citizens being forced to walk to my pharmacy or pregnant women being forced to stand when waiting for their medication, I've noticed the importance of assistive healthcare simply by seeing the absence of it firsthand. Although this topic is specific towards a marginalized group, it ultimately affects the entire world as other sectors are negatively impacted by the lack of technology provided such as the economy, infrastructure and socioeconomic development. When I was a delegate, I personally enjoyed humanitarian rights topics and large committees. I believe my strengths for debate include public speaking and collaborating with others. One of my favorite aspects about MUN is the ability to meet other delegates from various backgrounds and work to achieve a common goal. Not only is this an experience unique to Model UN in general, but discussing real world issues also is a distinctive trait that has only helped me work with others in the rest of my life.

Most importantly, my purpose at this conference is to be a guide and a resource for delegates, and if there are any questions or concerns that I can answer for you, please do not hesitate to reach out or ask! By discussing this topic, necessary light will be shed on such an overlooked issue, and I hope that the conference will invite plentiful debate as well as educational connections. Thank you for your interest and effort that you have put into being a delegate in the World Health Assembly, and I hope NHSMUN 2024 brings you all nothing but a grand ol' time!

Ivy Wilson
World Health Assembly, Session I
nhsmun.wha@imuna.org

NHSMUN
National High School Model United Nations

Email: info@imuna.org
Phone: +1 (212) 652-9992
Web: www.nhsmun.nyc

Dear Delegates,

It is with great pleasure that I welcome you to the 50th NHSMUN and, more specifically, to this year's World Health Assembly (WHA). My name is Ben Hislop, and I am so excited to see you all at the Hilton in March. My history with NHSMUN is short, sweet, and, until now, entirely within SOCHUM, having been a delegate in 2019 and last year's Session II Assistant Director. Despite my short time with MUN compared to some of my peers, it has truly shaped how I work and think. The experience I gained in public speaking, teamwork, and debate from my time as a delegate has been instrumental in the way I deal with projects at university and has helped me transition from a shy, quiet school kid into a much more outgoing and confident individual. Not only has NHSMUN helped me in my personal development, but it has afforded me many fantastic (and often cross-continental) friendships. The people I have met both as a delegate and as staff have introduced me to many new ideas, and I will always be grateful to NHSMUN for that. I hope that in your time on my committee. I hope you can forge friendships with people you would not have met.

When not at conferences or busy writing background guides, I study chemistry and medicinal chemistry at the University of Warwick in England. I am about to start my Master's research project on the chemical mechanisms of antibiotic resistance, a topic that I find deeply interesting and relevant to today's world. I have also just concluded a year's internship where I worked at a company developing software to aid England's National Health Service in their efforts to become net-zero by 2030 by assessing the emissions associated with commonly used medicines. Beyond academics, I enjoy music and play violin for an R&B singer and a folk punk band down in Bristol. At university, I'm a keen member of the Warwick Folk Society, where we play traditional folk music from the British Isles and Europe. I also spend much of my free time at the university's rowing club, where I endure many early mornings out on England's freezing rivers and brutal sessions in the rowing studio.

The healthcare industry is something I greatly believe in, and combined efforts between the scientific and political communities will help to amend the issues they face today. For this reason, I was very happy when the topics for this year were selected, and I'm sure you will bring great ideas to our committee. I think that both topics for this year's WHA offer you exciting and multidisciplinary lines of research that you will not have necessarily come across in your studies so far, and I hope that the position paper research will be as motivating as possible. Ivy and I have worked hard on preparing this year's topics for you all, and I hope you enjoy delving into the complexities of each of them. Once again, good luck with your research, and see you in March!

Ben Hislop
World Health Assembly, Session II
nhsmun.wha@imuna.org

Table of Contents

A Note on the NHSMUN Difference 5

A Note on Research and Preparation 7

Committee History 8

Strengthening the Health Workforce 9

Introduction 10

History and Description of the Issue 10

Current Status 27

Bloc Analysis 34

Committee Mission 36

Advancement of Assistive Health Technology in Developing States 37

Introduction 38

History and Description of the Issue 38

Current Status 54

Bloc Analysis 62

Committee Mission 64

Research and Preparation Questions 66

Important Documents 67

Works Cited 68

A Note on the NHSMUN Difference

Esteemed Faculty and Delegates,

Welcome to NHSMUN 2024! We are Dennis Zhang and Christian Hernandez, and we are this year's Secretary-General and Director-General. Thank you for choosing to attend NHSMUN, the world's largest and most diverse Model United Nations conference for secondary school students. This year is particularly special as NHSMUN celebrates its **50th Anniversary**, and we are thrilled to welcome you to our hometown, New York City, this March for this landmark year!

As a space for collaboration, consensus, and compromise, NHSMUN strives to transform today's brightest thinkers, speakers, and collaborators into tomorrow's leaders. Our organization provides a uniquely tailored experience for all through innovative and accessible programming. We believe that an emphasis on education through simulation is paramount to the Model UN experience, and this idea permeates throughout numerous aspects of the conference:

Realism and accuracy: Although a perfect simulation of the UN is never possible, we believe that one of the core educational responsibilities of MUN conferences is to educate students about how the UN System works. Each NHSMUN committee is a simulation of a real deliberative body so that delegates can research what their country has said in the committee. Our topics are chosen from the issues currently on the agenda of that committee (except historical committees, which take topics from the appropriate time period). We also strive to invite real UN, NGO, and field experts into each committee through our committee speakers program. Moreover, we arrange meetings between students and the actual UN Permanent Mission of the country they are representing. Our delegates have the incredible opportunity to conduct first-hand research, asking thought-provoking questions to current UN representatives and experts in their respective fields of study. These exclusive resources are only available due to IMUNA's formal association with the United Nations Department of Global Communications and consultative status with the Economic and Social Council. No other conference goes so far to deeply immerse students into the UN System.

Educational emphasis, even for awards: At the heart of NHSMUN lies education and compromise. Part of what makes NHSMUN so special is its diverse delegate base. As such, when NHSMUN distributes awards, we strongly de-emphasize their importance in comparison to the educational value of Model UN as an activity. NHSMUN seeks to reward students who excel in the arts of compromise and diplomacy. More importantly, we seek to develop an environment in which delegates can employ their critical thought processes and share ideas with their counterparts from around the world. Given our delegates' plurality of perspectives and experiences, we center our programming around the values of diplomacy and teamwork. In particular, our daises look for and promote constructive leadership that strives towards consensus, as real ambassadors do in the United Nations.

Debate founded on strong knowledge and accessibility: With knowledgeable staff members and delegates from over 70 countries, NHSMUN can facilitate an enriching experience reliant on substantively rigorous debate. To ensure this high quality of debate, our staff members produce detailed, accessible, and comprehensive topic guides (like the one below) to prepare delegates for the nuances inherent in each global issue. This process takes over six months, during which the Directors who lead our committees develop their topics with the valuable input of expert contributors. Because these topics are always changing and evolving, NHSMUN also produces update papers intended to bridge the gap of time between when the background guides are published and when committee starts in March. As such, this guide is designed to be a launching point from which delegates should delve further into their topics. The detailed knowledge that our Directors provide in this background guide through diligent research aims to increase critical thinking within delegates at NHSMUN.

Extremely engaged staff: At NHSMUN, our staffers care deeply about delegates' experiences and what they take away from

their time at NHSMUN. Before the conference, our Directors and Assistant Directors are trained rigorously through hours of workshops and exercises both virtual and in-person to provide the best conference experience possible. At the conference, delegates will have the opportunity to meet their dais members prior to the first committee session, where they may engage one-on-one to discuss their committees and topics. Our Directors and Assistant Directors are trained and empowered to be experts on their topics and they are always available to rapidly answer any questions delegates may have prior to the conference. Our Directors and Assistant Directors read every position paper submitted to NHSMUN and provide thoughtful comments on those submitted by the feedback deadline. Our staff aims not only to tailor the committee experience to delegates' reflections and research but also to facilitate an environment where all delegates' thoughts can be heard.

Empowering participation: The UN relies on the voices of all of its member states to create resolutions most likely to make a meaningful impact on the world. That is our philosophy at NHSMUN too. We believe that to properly delve into an issue and produce fruitful debate, it is crucial to focus the entire energy and attention of the room on the topic at hand. Our Rules of Procedure and our staff focus on making every voice in the committee heard, regardless of each delegate's country assignment or skill level. Additionally, unlike many other conferences, we also emphasize delegate participation after the conference. MUN delegates are well researched and aware of the UN's priorities, and they can serve as the vanguard for action on the Sustainable Development Goals (SDGs). Therefore, we are proud to connect students with other action-oriented organizations to encourage further work on the topics.

Focused committee time: We feel strongly that face-to-face interpersonal connections during debate are critical to producing superior committee experiences and allow for the free flow of ideas. Ensuring policies based on equality and inclusion is one way in which NHSMUN guarantees that every delegate has an equal opportunity to succeed in committee. In order to allow communication and collaboration to be maximized during committee, we have a very dedicated administrative team who work throughout the conference to type up, format, and print draft resolutions and working papers.

As always, we welcome any questions or concerns about the substantive program at NHSMUN 2024 and would be happy to discuss NHSMUN pedagogy with faculty or delegates.

Delegates, it is our sincerest hope that your time at NHSMUN will be thought-provoking and stimulating. NHSMUN is an incredible time to learn, grow, and embrace new opportunities. We look forward to seeing you work both as students and global citizens at the conference.

Best,

Dennis Zhang
Secretary-General

Christian Hernandez
Director-General

A Note on Research and Preparation

Delegate research and preparation is a critical element of attending NHSMUN and enjoying the debate experience. We have provided this Background Guide to introduce the topics that will be discussed in your committee. We encourage and expect each of you to critically explore the selected topics and be able to identify and analyze their intricacies upon arrival to NHSMUN in March.

The task of preparing for the conference can be challenging, but to assist delegates, we have updated our **Beginner Delegate Guide** and **Advanced Delegate Guide**. In particular, these guides contain more detailed instructions on how to prepare a position paper and excellent sources that delegates can use for research. Use these resources to your advantage. They can help transform a sometimes overwhelming task into what it should be: an engaging, interesting, and rewarding experience.

To accurately represent a country, delegates must be able to articulate its policies. Accordingly, NHSMUN requires each delegation (the one or two delegates representing a country in a committee) to write a position paper for each topic on the committee's agenda. In delegations with two students, we strongly encourage each student to research each topic to ensure that they are prepared to debate no matter which topic is selected first. More information about how to write and format position papers can be found in the NHSMUN Research Guide. To summarize, position papers should be structured into three sections:

I: Topic Background – This section should describe the history of the topic as it would be described by the delegate's country. Delegates do not need to give an exhaustive account of the topic, but rather focus on the details that are most important to the delegation's policy and proposed solutions.

II: Country Policy – This section should discuss the delegation's policy regarding the topic. Each paper should state the policy in plain terms and include the relevant statements, statistics, and research that support the effectiveness of the policy. Comparisons with other global issues are also appropriate here.

III. Proposed Solutions – This section should detail the delegation's proposed solutions to address the topic. Descriptions of each solution should be thorough. Each idea should clearly connect to the specific problem it aims to solve and identify potential obstacles to implementation and how they can be avoided. The solution should be a natural extension of the country's policy.

Each topic's position paper should be **no more than 10 pages** long double-spaced with standard margins and font size. **We recommend 3–5 pages per topic as a suitable length**. The paper must be written from the perspective of your assigned country and should articulate the policies you will espouse at the conference.

Each delegation is responsible for sending a copy of its papers to their committee Directors via myDais on or before **February 23, 2024**. If a delegate wishes to receive detailed feedback from the committee's dais, a position must be submitted on or before **February 2, 2024**. The papers received by this earlier deadline will be reviewed by the dais of each committee and returned prior to your arrival at the conference.

Complete instructions for how to submit position papers will be sent to faculty advisers via email. If delegations are unable to submit their position papers on time, please contact us at info@imuna.org.

Delegations that do not submit position papers will be ineligible for awards.

Committee History

The World Health Organization (WHO) was established on April 7, 1948, with the initial aim of serving as an international health organization.[1] To achieve this goal, the WHO Constitution divides the organization into three organs: The World Health Assembly (WHA), The Executive Board, and the Secretariat.[2] The WHA serves as the main legislative body, consisting of not more than three delegates representing each member state in the United Nations (UN).[3] Its main functions are to "determine the policies of the Organization, appoint the Director-General, supervise financial policies, and review and approve the proposed programme budget," alongside a host of other financial, legislative, and public health duties.[3] Some of the legislation that the WHA has the power to discuss how to enact include sanitary and quarantine procedures, diseases nomenclatures, and standards for diagnostic procedures and biological goods.[4]

Similar to other organs outside the Security Council, the WHA has no mandate-issuing authority. Therefore, the WHA's work primarily consists of legislative recommendations to member states, as well as setting goals for the WHO. There is a very distinct set of decision-making rules for guideline development groups to ensure impartial and respectful dialogue when debating.[5] Guideline development groups meet to decide for or against intervention in certain cases, taking into account the benefits and harm that the UN's intervention may cause to respective countries. However, in instances of global pandemics, the WHA has the power to declare global health emergencies—a power granted to it by the International Health Regulations (IHR) passed in 2007.[6] Examples include the Ebola outbreak in 2013 and the COVID-19 Pandemic that started in 2020. Along with other member states that prioritize international collaboration, WHO discusses their perspective on a specific health agenda arranged by the Executive Board.[7] Its power comes from dialogue discussion between the member states. The total number of member states of this committee is 194.[8]

It has been observed that since the foundation of the World Health Organization, public health challenges have been reduced and even eradicated as a result of the efforts of such organizations. Some of the most memorable milestone achievements are the acceleration of the discovery of antibiotics, the elaboration of the International Health Regulations, and the successful smallpox eradication following a 12-year global vaccination campaign. Despite the WHA's infrastructural capabilities, logistical or bureaucratic challenges can sometimes arise. For instance, during the COVID-19 pandemic, many critics emerged concerning the slow decision-making. Despite the limitations, the organization has proven the importance of its existence and the relevancy of international cooperation.

1 "History," WHO, accessed September 23, 2023, https://www.who.int/about/history.
2 WHO, "History."
3 "World Health Assembly," WHO, accessed September 23, 2023, https://www.who.int/about/governance/world-health-assembly.
4 WHO, "History."
5 "Basic Documents," World Health Organization, accessed September 23, 2023, https://apps.who.int/gb/bd/pdf_files/BD_49th-en.pdf.
6 "Hosted Partnerships," WHO, accessed September 23, 2023, https://www.who.int/about/collaboration/partnerships/hosted-partnerships.
7 WHO, "History."
8 WHO, "Constitution of The World Health Organization," https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-x.pdf?ua=1.

WHA

NHSMUN 2024

TOPIC A:
STRENGTHENING THE HEALTH WORKFORCE

Photo Credit: CDC Global

Introduction

The World Health Organization (WHO) defines a healthcare worker as someone "whose job it is to protect and improve the health of their communities."[1] These workers carry the world's health on their shoulders when they work every day. However, deteriorating infrastructure, unequal pay, few opportunities, and migration are causing the world to experience a worker shortage and low access to universal healthcare. [2]After COVID-19, the world is at a pivotal moment in human history, where the demand for accessible, high-quality healthcare has never been more urgent.

With increased health workforce challenges beyond borders, the strain on the workforce is unimaginable. These challenges encompass healthcare shortages that put pressure on the capacity of global health systems. In addition, under-investment in education and training of health workers in some countries is contributing to continuous shortages.[3] These are caused by difficulties in deploying health workers to rural and remote areas. Moreover, the increasing international migration of health workers is aiding health workforce shortfalls, particularly in low-income countries.

Furthermore, while universal healthcare has increased dramatically over the last few years, the population has grown exponentially. Governments need help to keep up. For almost 100 million people, working in healthcare or receiving healthcare coverage pushes them into extreme poverty due to poor working conditions, unequal access, and high costs.[4] With this in mind, the WHA is tasked with strengthening the global workforce to address the shortage crisis and create solutions around affordable healthcare. Furthermore, regulation is needed around healthcare migration, working conditions, low salaries, and education. With a young population averaging only 30 years, now is the perfect time to set up future generations towards a healthcare career and ensure the longevity of human beings. Health systems can only function with effective and distributed health workers and improving health service coverage. The world's health relies on their availability, accessibility, and quality.

History and Description of the Issue

The Healthcare Shortage

Around the world, there are 65.1 million health workers.[5] However, more than this number is needed. By 2030, the WHO estimates there will be a global shortage of approximately 18 million health workers—20 percent of the workforce necessary to keep healthcare systems going.[6] This shortage is named to be the biggest crisis facing the global workforce and the biggest constraint to achieving long-lasting, primary, and universal healthcare.[7] This number is driven by insufficient finances, unequal access to education and resources, and finally, migration.[8] These factors all dramatically shorten the span of the health workforce and create a severe lack of essential health services, especially for those in conflict zones and developing states.

However, worker shortage is unfortunately not a new issue. These issues tied to healthcare can even be pinpointed back

1 Laura Woodman, "Healthcare Worker, Everything You Need to Know about It," *Caring Support*, (February 2023), https://www.caringsupport.com/blog/healthcare-worker-everything-you-need-to-know-about-it
2 McGrail, Matthew R. and O'Sullivan, Belinda G. "Increasing doctors working in specific rural regions through selection from and training in the same region: national evidence from Australia". *Human Resources Health.* Vol. 19. October 29, 2021. https://doi.org/10.1186/s12960-021-00678-w
3 World Health Organization, "Health Workforce," August 7, 2019, https://www.who.int/health-topics/health-workforce#tab=tab_1.
4 World Health Organization, "World Bank and WHO: Half the World Lacks Access to Essential Health Services, 100 Million Still Pushed into Extreme Poverty because of Health Expenses," December 13, 2017, https://www.who.int/news/item/13-12-2017-world-bank-and-who-half-the-world-lacks-access-to-essential-health-services-100-million-still-pushed-into-extreme-poverty-because-of-health-expenses.
5 Mathieu Boniol et al., "The Global Health Workforce Stock and Distribution in 2020 and 2030: A Threat to Equity and 'Universal' Health Coverage?," *BMJ Global Health* 7, no. 6 (June 1, 2022): e009316–16, https://doi.org/10.1136/bmjgh-2022-009316.
6 "Human: Solving the Global Workforce Crisis in Healthcare," *KPMG*, February 22, 2023, https://kpmg.com/xx/en/home/insights/2019/03/human-solving-the-global-workforce-crisis-in-healthcare.html.
7 "Health workforce: The health workforce crisis," *World Health Organization,* June 24, 2009, https://www.who.int/news-room/questions-and-answers/item/q-a-on-the-health-workforce-crisis.
8 World Health Organization, "Health workforce: The health workforce crisis."

to World War II.[9] Many healthcare workers themselves had lost their jobs, homes, or even their lives in service to providing treatment to soldiers during the early 1940s. Once the war was over, physicians and nurses were expected to resume their pre-war jobs, and the nurse shortage would cease. Unfortunately, this did not happen. In fact, not only did the shortage continue, but it also increased in severity.[10] Workers who had served in the military failed to return to their former positions, and hospitals spent much of the late 1940s trying to hire back their staff.[11] Furthermore, several outbreaks, including Malaria and Smallpox, ravaged the world, causing the healthcare system to work on overdrive before finally collapsing.[12] Health science and practice was noted as a career with few financial rewards, no progression, and severe mental challenges, which aided in the severe shortage post-war. To counter this, many Allied countries created a system to reward doctors and nurses with board certification, rank, and pay.[13] This sparked a new career specialization in health. This was also the birthplace of medical insurance, which, at the time, ensured equitable and affordable access to beds and medicine in hospitals.[14] Unfortunately, despite these initiatives, the shortage has never been replaced.

Continuing to the early 2000s, a rapid increase in healthcare specialization was seen. In 2005, the health workforce was 59 million strong. However, it is also four million short.[15] Exacerbated by a massive outbreak of HIV/AIDS in Africa and Asia, many workers were faced with poor infrastructure and a shortage of supplies that hindered them from performing their duties effectively.[16] In a WHO report of the same year, the findings suggest that healthcare workers were afraid of contracting HIV from their patients.[17] The other concern was the heavy workload and severe time constraints, which put enormous stress on healthcare workers. Stigma and discrimination emerged as significant problems as well, which furthered the divide between those who could deliver care and those who needed it.[18]

One of the most significant driving factors of these shortages, aside from the ones mentioned above, is the financial situation around paying healthcare workers as well as investing in infrastructure. In an International Labour Organization study of 49 countries, nurses and midwives were paid lower salaries in 30. Moreover, people of color and women were paid even less than their counterparts in 20 countries.[19] Besides poor compensation, healthcare workers need better treatment and over-demanding shifts. Healthcare workers are often exploited, and along with low salaries, leads to low job satisfaction and high-income rates.[20] Another financial reason is more investment in health worker education and training in some countries. Likewise, in some countries, obstacles to universal access to health professionals may be made worse by the public sector's inability to take the supply of health workers due to budget constraints. As a result, several countries are confronted with the dilemma of health worker unemployment along with significant health requirements that are not enough.[21]

Another reason for this massive shortage is more access to education and training capacity. Healthcare occupations

9 "Where Did All the Nurses Go?," *University of Pennsylvania,* 2019, https://www.nursing.upenn.edu/nhhc/workforce-issues/where-did-all-the-nurses-go/.
10 University of Pennsylvania, "Where Did All the Nurses Go?."
11 University of Pennsylvania, "Where Did All the Nurses Go?."
12 H. Markel, "Worldly Approaches to Global Health: 1851 to the Present," ***Public Health*** 128, no. 2 (February 2014): 124–28, https://doi.org/10.1016/j.puhe.2013.08.004.
13 Justin Barr and Scott H Podolsky, "A National Medical Response to Crisis — the Legacy of World War II," ***The New England Journal of Medicine*** 383, no. 7 (August 13, 2020): 613–15, https://doi.org/10.1056/nejmp2008512.
14 Alex Blumberg, "Accidents of History Created U.S. Health System," ***NPR***, October 22, 2009, https://www.npr.org/2009/10/22/114045132/accidents-of-history-created-u-s-health-system.
15 World Health Organization, "Working Together for Health" (Geneva: WHO Press, 2006), https://apps.who.int/iris/bitstream/handle/10665/43432/9241563176_eng.pdf.
16 Masebeo Koto and Pranitha Maharaj, "Difficulties Facing Healthcare Workers in the Era of AIDS Treatment in Lesotho," *SAHARA-J* 13, no. 1 (January 1, 2016): 53–59, https://doi.org/10.1080/17290376.2016.1179588.
17 WHO, *Working Together for Health.*
18 WHO, *Working Together for Health.*
19 Donika Limani, "Nurses and Midwives: Overworked, Underpaid, Undervalued? - ILOSTAT," *ILOSTAT*, May 12, 2023, https://ilostat.ilo.org/nurses-and-midwives-overworked-underpaid-undervalued/.
20 Sue Ellen Carroll, "The Causes & Effects of Staff Shortages in Healthcare," *AArete,* last modified May 24, 2023, https://www.aarete.com/insights/the-causes-and-effects-of-staff-shortages-in-healthcare/.
21 World Health Organization (WHO), "Health Workforce," *WHO International,* last modified August 7, 2019, https://www.who.int/health-topics/health-workforce#tab=tab_1.

frequently need extensive education and training, which can be delayed by issues such as the availability of schools, clinical training sites, and skilled educators. According to the World Health Organization (WHO), not enough people are now enrolled in training in health-related careers, which makes the existing gap likely to widen.[22] Another contribution is migration. According to the WHO in its 2023 health workforce support and safeguards list, the adverse health, economic, and social effects of COVID-19, combined with the increased demand for healthcare workers in high-income countries during the pandemic, likely contributed to more outward migration of healthcare workers from countries with low health workforce densities.[23] Dr. Tedros Adhanom Ghebreyesus, WHO Director-General, stated in a press release that accompanied the report that "Health workers are the backbone of every health system, and yet 55 countries with some of the world's most fragile health systems do not have enough, and many are losing their health workers to international migration."[24]

Finally, there is one more contributing factor to the shortage: COVID-19. An aging population, more long-term illnesses, plus post-COVID exhaustion have combined to create a perfect healthcare storm that is likely to get worse before it gets better. While COVID-19 may not have had the same effect as the Spanish Influenza, for example, it did strain our modern medical system. The pandemic pulled apart the fibers of the global healthcare ecosystem and exposed some significant shortcomings in pandemic preparedness, which has caused ripple effects throughout the world.[25] In the United States, an article by McKinsey & Co. cites how, over the past five years, turnover in the healthcare workforce rose from 17 percent to 21 percent.[26] Further, in 2021, three million more Americans working in healthcare retired before the age of 65, citing the pandemic as the cause. Another American Medical Association study found that "20 percent of physicians said they were likely to leave their current jobs within two years, while one-third planned to reduce their work hours in the next 12 months."[27] Nurses are leaving the profession at an unprecedented rate due to burnout, and aging medical professionals are seeking to reduce their hours or retire early due to pandemic fears. Unsurprisingly, healthcare workers also started contracting the virus, contributing to staffing shortages. This will even continue to impact the workforce in the future due to the lingering health effects of long COVID.[28]

While a pandemic exacerbates burnout and stress, loss of life is the leading cause here. A 2021 working paper by the WHO claims that the 6,633 reported healthcare worker deaths due to the pandemic falls short of reality, which they estimate could be anywhere between 83,000 and 115,000.[29] This underreporting comes from insufficient data and infrastructure in the Global South, where the pandemic has dramatically affected the quality of living for those in healthcare.[30] WHO Director-General Tedros Adhanom Ghebreyesus has also stated that health workers in the Global South are the backbone of equitable health care, and yet "55 countries with some of the world's most fragile health systems simply do not have enough healthcare workers."[31]

Taking a regional look, Africa faces the worst of the shortage. Its Northern counterparts had the highest number of

22 World Health Organization (WHO), "Encouraging Medical Education to Bolster the Global Health Care Workforce," *WHO International,* accessed September 1, 2023, https://www.who.int/activities/encouraging-medical-education-to-bolster-the-global-health-care-workforce.
23 World Health Organization, "WHO health workforce support and safeguards list" (Geneva: World Health Organization, 2023), https://www.who.int/publications/i/item/9789240069787
24 Megha Kaveri, "WHO Raises Alarm over Increased Healthcare Worker Migration to Rich Countries Post Pandemic," *Health Policy Watch,* March 14, 2023, https://healthpolicy-watch.news/eight-country-healthcare-workers-migration/.
25 Matt McNeill, "Extraordinary Impacts on the Healthcare Workforce":, *Delaware Journal of Public Health* 8, no. 5 (December 1, 2022): 164–67, https://doi.org/10.32481/djph.2022.12.038.
26 Gretchen Berlin et al., "Assessing the Lingering Impact of COVID-19 on the Nursing Workforce," *McKinsey & Company* (McKinsey & Company, May 11, 2022), https://www.mckinsey.com/industries/healthcare/our-insights/assessing-the-lingering-impact-of-covid-19-on-the-nursing-workforce.
27 Matt McNeill, "Extraordinary Impacts on the Healthcare Workforce":, *Delaware Journal of Public Health* 8, no. 5 (December 1, 2022): 164–67, https://doi.org/10.32481/djph.2022.12.038.
28 Victoria Bailey, "COVID-19 Pandemic Exacerbated Healthcare Workforce Challenges," *RevCycleIntelligence*, May 5, 2022, https://revcycleintelligence.com/news/covid-19-pandemic-exacerbated-healthcare-workforce-challenges.
29 McNeill, "Extraordinary Impacts on the Healthcare Workforce".
30 McNeill, "Extraordinary Impacts on the Healthcare Workforce".
31 UN News, "55 Countries Face a Health Worker Crunch Linked to COVID-19: WHO," March 14, 2023, https://news.un.org/en/story/2023/03/1134562.

Tedros Adhanom Ghebreyesus speaking at the 2018 AI for Good Global Summit

Credit: AI for Good Global Summit 2018

doctors, with 4.1 million, and 7.6 million nurses in 2020.[32] Comparatively, the African region had only around 300,000 doctors and 1.2 million nurses in the same year. Moreover, the continent is projected to account for a six million healthcare worker shortage by 2030, making up 33 percent of the global shortage.[33] Unfortunately, with a high disease burden, it also means that the smallest number of doctors care for the most ill patients, with 1.3 percent of healthcare workers caring for 25 percent of the world's disease burden.[34] Ultimately, the healthcare shortage is not an isolated issue; it is connected with larger systemic challenges such as education, gender inequality, racial differences, and access to quality healthcare, which will be discussed further. Addressing these underlying issues will be crucial in building a sustainable and robust healthcare workforce that can effectively meet the needs of communities worldwide and build back a workforce that will meet the needs of a growing population and cover the shortage gap.

Working Conditions

The working conditions of healthcare professionals are completely linked to the field's worker shortage. Many healthcare workers have to deal with long and difficult hours, experience significant levels of stress, and physically and emotionally challenging settings. This can result in burnout and work unhappiness, driving experienced experts out of the industry and preventing potential newcomers from pursuing healthcare employment. Furthermore, the lack of health professionals in the field increases the poor working conditions, creating a cycle of poor development.[35]

One of the main reasons for poor working conditions is the patient load. High patient loads can cause various issues, such as restricted time for each patient, increased stress, and probable burnout among healthcare staff. When healthcare personnel are overburdened with numerous patients, they may struggle to offer the high-quality care that they strive to provide. During the COVID-19 pandemic, healthcare workers experienced an increased number of patients. In prior pandemics, healthcare personnel reported increased task demands, depression, societal stigmas, post-traumatic stress, anxiety, exhaustion, and moral distress. [36]During the COVID-19 pandemic, healthcare

32 WHO Regional Office for Africa, "Chronic Staff Shortfalls Stifle Africa's Health Systems: WHO Study," 2022, https://www.afro.who.int/news/chronic-staff-shortfalls-stifle-africas-health-systems-who-study.
33 WHO Regional Office for Africa, "Chronic Staff Shortfalls Stifle Africa's Health Systems: WHO Study."
34 Saraladevi Naicker, "Shortage of Healthcare Workers in Developing Countries--Africa," *Ethnicity & Disease* 19, no. 1 Suppl 1 (2023), https://pubmed.ncbi.nlm.nih.gov/19484878/.
35 CDC, "Work Stress," *CDC*, last modified November 6, 2018, https://www.cdc.gov/niosh/topics/healthcare/workstress.html.
36 Cosby, A.G. "Growth and Persistence of Place-Based Mortality in the United States: The Rural Mortality Penalty". *Am J Public Health.*

workers reported experiencing increased patient acuity, an increase in mortality exposure, changes in staffing patterns, environmental demands, and a heightened sense of personal danger as a result of the virus's lethality.[37]

Even though COVID-19 made the patient load exponentially increase, it had already been increasing before the pandemic. According to a 2012 Annals of Family Medicine article, the average primary-care physician has roughly 2,300 people under their care. With these numbers, the paper estimated that each physician would be required to "spend 21.7 hours per day providing all recommended acute, chronic, and preventive care for a panel of 2,500 patients."[38] In another study conducted by the American Academy of Family Physicians, the average doctor member of that group has 93.2 patient encounters each week. That's about 19 patients per day. This rise in patient load in these previous years is most likely attributable to a combination of reasons, including an aging population and the Affordable Care Act (ACA), which has increased access to health insurance. Because of the Affordable Care Act, more people now have health insurance, and as a result, more people are seeking primary care services.[39]

Workload is the most important predictor of burnout, lack of involvement, and dehumanization of patients by healthcare personnel. It is also a major cause of dissatisfaction among healthcare givers and support staff, and has been found to influence staff decisions whether to leave or remain in their jobs.[40] Patient load also significantly affects the well-being and mental health of the workers. Research suggests that those with a higher workload tend to report more health problems as compared to those with lesser workloads. For example, it was reported in a study that nurses run the risk of physical and mental health problems and burnout because of their engagement in physically and mentally demanding tasks.[41] When healthcare professionals are overwhelmed with many patients, they may struggle to provide the quality of care they aspire to deliver. Therefore, patient load not only needs to be addressed to improve the shortage, but also to ensure better health and care delivery from healthcare professionals. To improve working conditions and maintain high-quality patient care, it is vital to optimize workflow processes, provide adequate resources, and support healthcare professionals. [42]

Another reason that goes hand in hand with patient load is shift work. A shift worker is described as anybody who works non-standard or extended hours, such as working late at night or starting work very early.[43] Working irregular hours, especially evenings and shifts, is essential in the nursing and medical professions, even though shift work has long been recognized as a health and safety concern. Individuals' physical, psychological, and social well-being are threatened by irregular hours and shift employment. It has been found that there are both short and long-term occupational health concerns related to shift employment.[44] According to studies conducted among nurses in Japan and the United States, irregular shifts harm the circadian rhythm, failing many physiological functions and metabolic disorders. In addition, shift work has been associated with obesity, gastrointestinal illnesses, cardiovascular diseases, duodenal issues, infectious diseases, and difficulties in both muscles and bones. Shift employment has also been linked to mental health issues such as depression and suicide.[45]

Equally important is the poor physical infrastructure many healthcare workers globally work in. Poor physical

January 2019. 109(1). https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2018.304787
37 Gemma Doleman, Annemarie De Leo, and Dianne Bloxsome, "The Impact of Pandemics on Healthcare Providers' Workloads: A Scoping Review," *Journal of Advanced Nursing*, (May 2023): 2, https://doi.org/10.1111/jan.15690.
38 Lenny Bernstein, "How Many Patients Should Your Doctor See Each Day?," *Washington Post*, May 22, 2014, https://www.washingtonpost.com/news/to-your-health/wp/2014/05/22/how-many-patients-should-your-doctor-see-each-day/.
39 Bernstein, "How Many Patients Should Your Doctor See Each Day?."
40 Zodwa M. Manyisa and Elsie J. van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," *International Journal of Africa Nursing Sciences* 6, (February 2017): 28–38, https://doi.org/10.1016/j.ijans.2017.02.002.
41 Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.
42 Kwame, A., Petrucka, P.M. "A literature-based study of patient-centered care and communication in nurse-patient interactions: barriers, facilitators and the way forward". *BMC Nursing*. September 3, 2021. https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-021-00684-2
43 Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.
44 Linsey M. Barker and Maury A. Nussbaum, "Fatigue, Performance and the Work Environment: A Survey of Registered Nurses," *Journal of Advanced Nursing* 67, no. 6 (February, 2011): 1170–1406, https://doi.org/10.1111/j.1365-2648.2010.05597.x.
45 Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.

infrastructure has been highlighted as one of the primary elements contributing to employees' poor working conditions. According to a report done by the Department of Public Service Administration in South Africa, one-third of the country's public facilities require total replacement or major repair.[46] The National Department of Health's models also indicated that medical equipment was deteriorating rapidly and that there was an urgent need for major ongoing maintenance or substantial replacement of such equipment.[47] Patients' private rights are at risk due to a lack of space. Many institutions were identified as being too small to meet the demands placed on them.[48]

Improving healthcare infrastructure is critical for improving working conditions in the healthcare industry. Infrastructure upgrades might include advanced medical equipment, modern buildings, and new technology integration, all of which have a direct impact on the quality and efficiency of care delivery.[49] Furthermore, investments in telehealth infrastructure allow healthcare practitioners to give care remotely, potentially lowering their exposure to infectious diseases and allowing for more balanced work schedules. Overall, investing in healthcare infrastructure is an important step towards building a supportive, efficient, and safe working environment for healthcare professionals, which will ultimately benefit patients and strengthen the healthcare system. [50]

Moreover, there are concerns about inadequate medical resources. This (as well as the issue with crumbling infrastructure) problem is directly related to the lack of investment in the health system. In hospitals, a lack of resources is a major factor in bad working conditions. Shortages of critical supplies, such as personal protective equipment (PPE) or medical supplies, not only put healthcare workers' safety at risk but also cause tension and anxiety. Budget restrictions can result in tired and worn-out healthcare employees, significantly compromising patient care and contributing to burnout. [51] A lack of access to modern medical equipment and technology harms the inability to offer high-quality care efficiently. According to a new report from

46 Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.
47 Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.
48 Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.
49 Tadibonia, S.N. "The importance and leverage of modern information technology infrastructure in the healthcare industry". *New York Institute of Technology*. December 2022. Doi: https://dx.doi.org/10.6084/m9.doione.IJRTI2212044
50 Stoumpos, A.I. et.al. "Digital Transformation in Healthcare: Technology Acceptance and Its Applications". *Int J Environ Res Public Health*. February 2023. Vol. 20 (4). DOI: https://doi.org/10.3390/ijerph20043407
51 World Health Organization, "Close to One Billion People Globally Are Served by Health-Care Facilities with No Electricity Access or with Unreliable Electricity" *WHO*, January 14, 2023, https://www.who.int/news/item/14-01-2023-close-to-one-billion-people-globally-are-served-by-health-care-facilities-with-no-electricity-access-or-with-unreliable-electricity.

Nurses striking in the United Kingdom
Credit: ReelNews

WHO, the World Bank, the International Renewable Energy Agency (IRENA), and Sustainable Energy for All, nearly 1 billion people in low and lower-middle-income countries are served by healthcare facilities with unreliable electricity supply or no electricity access at all. Access to electricity is crucial for effective healthcare services, such as delivering infants, handling emergencies such as heart attacks, and providing immunizations to save lives. According to the research, Universal Health Coverage cannot be achieved unless all healthcare institutions have reliable energy.[52] This is only one example of the many shortages of supplies and equipment that hospitals face. Scarce resources make it difficult for healthcare workers to do their jobs effectively. This not only affects the care delivery and health of the patients, but also the well-being and mental health of the doctors, nurses, and other workers. Another example of this issue is taking place in the UK. Many hospitals are suffering from severe shortages of key medical equipment such as ventilators, drug administration pumps, and oxygen cylinders.[53] According to NHS England, the service is under the most tension it has been under since the 1990s. Patients have had to wait long for beds on trolleys at congested hospitals. More than 100,000 people have been detained in ambulances waiting to be sent to an A&E facility.[54] Scarce resources can harm healthcare workers' physical and emotional well-being, leading to dissatisfaction with their jobs and ultimately affecting the overall quality of healthcare services. Addressing resource shortages is essential to creating a valuable and safe working environment for healthcare professionals and ensuring optimal patient care. [55]

The shortage of healthcare workers can complicate these working conditions further, as the existing workforce often needs to take on heavier workloads and cover staffing gaps. This increased pressure can result in fatigue, reduced quality care, and a higher risk of medical errors, ultimately leading to a vicious cycle where unfavorable working conditions contribute to shortages, which in turn worsen the working environment.[56] Addressing the shortage of healthcare workers requires not only recruitment efforts but also improvements in working conditions, such as reasonable hours, adequate staffing levels, mental health support, and competitive compensation. A healthier work environment can help keep existing professionals, attract new talent, and ultimately ensure better patient care.

Health Worker Migration

One of the earlier discussed factors was migration. More often than not, health workers are not seen staying in their countries of birth or the countries they completed their practice in. This is known as health worker migration. The WHO identifies certain countries as more vulnerable than others to losing health personnel, especially to international migration. While the WHO does not prohibit the international migration of healthcare workers, certain safeguards must be in place to avoid some of the unintended consequences of migration.[57] These safeguards could include increased financial support to keep workers in the country or better benefits for joining this career field. International mobility of healthcare workers is a powerful tool to strengthen the health workforce worldwide if handled ethically. [58]

The issue of health worker migration is not new to the UN. In 2003, the International Labour Organization (ILO) called attention to increasing health worker migration, naming it a global economic trend. Originally, healthcare worker migration patterns would follow colonial ones (for example, North Africa to France or the Caribbean to the United Kingdom).[59] These patterns have since changed, reflecting health workers' desire to work in richer cities and countries. Issues of health worker

52 World Health Organization, "Close to One Billion People Globally Are Served by Health-Care Facilities with No Electricity Access or with Unreliable Electricity".
53 Denis Campbell, "NHS Hospitals Facing Serious Shortages of Vital Equipment," *The Guardian*, January 25, 2018, https://www.theguardian.com/society/2018/jan/25/nhs-hospitals-serious-shortages-vital-equipment.
54 Campbell, "NHS Hospitals Facing Serious Shortages of Vital Equipment."
55 Benishek, L.E. "Mitigating Health-Care Worker Distress From Scarce Medical Resource Allocation During a Public Health Crisis". *Chest*. August 6, 2020. DOI: https://doi.org/10.1016/j.chest.2020.07.073
56 Izdebski, Z. et.al. "Occupational Burnout in Healthcare Workers, Stress and Other Symptoms of Work Overload during the COVID-19 Pandemic in Poland". *Int J Environ Res Public Health*. February 2023. Vol. 20(3). DOI: https://doi.org/10.3390/ijerph20032428
57 World Health Organization, "Health workforce: The health workforce crisis."
58 World Health Organization, "Health workforce: The health workforce crisis."
59 International Labour Organization, "Migrant Health Workers: Is One Country's Gain Another's Pain?," December 19, 2003, https://doi.org/FTR/03/healthworkers.

migration, however, have been documented for decades, far further than the early 2000s. The ILO provides a history of health worker migration trends that started in the 1950s, when countries expanded their welfare states and recruited more health workers from abroad. Shortly after, the WHO began to analyze migration patterns in the 1970s.[60] In the late 2000s, the global economic crisis combined with the Swine Flu breakout had negative effects on the global workforce and thus caused an influx of health worker migration, as reported by the Organisation for Economic Co-Operation and Development (OECD).[61] There are many reasons why a healthcare worker might migrate to a different country. These reasons are either push factors or pull factors. Push factors are conditions in a healthcare worker's home country that might drive them away from the health system they are currently in. Pull factors are conditions abroad that give health workers an incentive to migrate.[62]

While it is difficult to track how many health workers are migrating to and from which countries, the general trend is that healthcare workers in low- and middle-income countries migrate to high-income countries after they receive medical training. Working from that, the OECD made an effort in 2007 to collect data on healthcare worker migration trends in its member countries. Countries in the United States and Europe rely more and more on foreign-born health personnel to fill shortages of healthcare workers over time. Thus, it is the combination of push and pull factors in certain regions of the world that drive global health worker migration trends.[63]

One major push factor for health worker migration is political insecurity and crime in the home country. Health personnel in South Africa reported that occurrences of sexual assault and gang violence were the main push factors for migration, especially in the public sector.[64] Health workers who were interviewed in a 2014 study claimed that ethnic conflict and fear for personal safety in their North African home countries drove them to flee to countries like France, Austria, and Belgium because their political environments were perceived as more stable. In the Philippines, stakeholders in a 2017 study reported that poor funding of the healthcare system resulted in underemployment for health personnel.[65] This causes job satisfaction to decrease, driving healthcare workers to leave for countries like Canada, the United States, and the United Kingdom. Nurses reported being unable to practice because hospitals did not offer enough positions, and career opportunities for doctors to specialize were limited. Job satisfaction depends on several factors. In Uganda, the largest reported risk factor for migration to higher-income countries was compensation.[66] However, poor working conditions are also a major factor for workers there. Minimal healthcare equipment and medication, heavy workload, staffing issues, and poor management at work were the most reported push factors for Ugandan healthcare workers to migrate to higher-income countries. Weak human resources and the poor management of healthcare resources and personnel are major factors that drive healthcare workers out of their home countries. These factors can even harm the career goals and morale of healthcare professionals in low and middle-income countries. These push factors make it difficult for healthcare workers in certain regions to stay in their home countries, encouraging them to migrate. [67]

Many factors make a certain country a destination for migrating healthcare workers. A good example of push and pull factors

60 Stephen Bach, "SECTORAL ACTIVITIES PROGRAMME Working Paper International Migration of Health Workers: Labour and Social Issues," 2003, https://www.aspeninstitute.org/wp-content/uploads/files/content/images/Bach%20Health%20worker%20Migration%20WP.pdf.
61 Organization for Economic Co-operation and Development, *Policy Brief: International Migration of Health Workers*, (Paris: OECD, 2010), https://www.oecd.org/els/health-systems/44783473.pdf.
62 Christoph Aluttis, Tewabech Bishaw, and Martina W. Frank, "The Workforce for Health in a Globalized Context – Global Shortages and International Migration," *Global Health Action* 7, no. 1 (February 13, 2014): 23611, https://doi.org/10.3402/gha.v7.23611.
63 Organization for Economic Co-operation and Development. "Policy Brief: International Migration of Health Workers". Paris: *OECD*, 2010. https://www.oecd.org/els/health-systems/44783473.pdf.
64 Labonté, R.et.al. "Health worker migration from South Africa: causes, consequences and policy responses". *Human Resources for Health*. December 3, 2015. https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-015-0093-4
65 World Health Organization. "The Philippines Health System Review". *Health Systems in Transition.* Vol. 8 (2). 2018. [PDF]. https://apps.who.int/iris/bitstream/handle/10665/274579/9789290226734-eng.pdf
66 International Organization for Migration. "Migration in Uganda". 2015. [PDF]. https://publications.iom.int/system/files/pdf/mp_uganda_25feb2015_web.pdf
67 International Organization for Migration. "Migration in Uganda".

working together to encourage a healthcare worker to migrate is in South African health personnel.[68] The same doctors and nurses who reported gang violence and sexual assault as a push factor for migration also had families living in parts of Europe. Family reunification is a major pull factor for health worker migration. Family living in a country that has more desirable working conditions, pay, or career opportunities decides to migrate more likely.[69] A study of over 300 physicians in the United Arab Emirates had similar findings related to family. Physicians who migrated to the United Arab Emirates to practice reported that the largest factor preventing them from migrating back to their home countries was being close to extended family.[70] Furthermore, they reported that employment opportunities for their spouses were another pull factor for migration to the United Arab Emirates.

In general, migration can shape family closeness, and family reunification plays a large role in where health workers spend their careers. Some migrating healthcare workers choose destination countries because of educational opportunities abroad. It is estimated that the United States physician workforce included almost half of Lebanon's medical school graduates in the last 25 years. That is, most medical students leave Lebanon for countries like the United States to pursue further clinical training. Some studies report a societal expectation in Lebanon that medical school graduates pursue specialty or subspecialty training abroad rather than at home. Further, observerships and electives are opportunities abroad that make migration more desirable for Lebanese medical students.[71]

Perceived higher-quality education in North American and Western European countries is a large driver for health worker migration out of low- and middle-income countries. In many source countries of migrating health workers, there is also a culture that overseas medical practices are superior, according to a 2014 report.[72] The report highlights migration patterns in smaller island states, such as Fiji, Tonga, and Samoa. It is believed that working abroad is necessary to be an effective health worker compared to remaining in the home country. In these island states, the same attitudes apply to technology and advanced skills that can only be found overseas. Medical students in these countries can also rely on scholarships abroad to gain advanced training, similar to Lebanon. Smaller states like Fiji, Tonga, and Samoa are affected the most by these pull factors: the family obligation to migrate, educational opportunities abroad, and a culture that superior healthcare systems exist overseas. Pull factors that encourage health workers to migrate are complex and require special attention from the WHA. While migration can have negative effects on source and destination countries, migration can also improve the lives of health workers in low- and middle-income countries.

Push and pull factors for the migration of health workers affect individual health workers' choices. However, migration impacts source and destination countries as a whole. The effects of migration on the countries involved can be positive or negative. In 2023, the WHO Secretariat published its updated Health Workforce Support and Safeguards List (SSL), according to 2020 guidelines by WHO.[73] Countries on the list contain the most pressing health workforce needs in the world and receive special attention from WHO to improve their health workforce. Countries on the SSL have a critically low density of healthcare workers. This means there are not enough professionals in these countries to provide quality healthcare. Many of these countries lose skilled healthcare workers to migration. They are called source countries. Source countries face the most negative effects of health worker migration, and their health systems are the most vulnerable during health emergencies like the COVID-19 pandemic.[74]

68 Labonté, R.et.al. "Health worker migration from South Africa: causes, consequences and policy responses".
69 Poppe, A. et.al. "Why sub-Saharan African health workers migrate to European countries that do not actively recruit: a qualitative study post-migration". *Global Health Action*. May 2014. https://doi.org/10.3402/gha.v7.24071
70 Siyam,A. Dal Poz, M.R. "Migration of Health Workers". World Health Organization.
71 Sabban, R. "United Arab Emirates: Migrant Women in the United Arab Emirates". *International Labour Office*. September 3, 2023. https://www.ilo.org/wcmsp5/groups/public/@ed_emp/documents/publication/wcms_117955.pdf
72 Sabban, R. "United Arab Emirates: Migrant Women in the United Arab Emirates".
73 World Health Organization. "WHO health workforce support and safeguards list 2023". Publications. March 8, 2023. https://www.who.int/publications/i/item/9789240069787
74 World Health Organization. "WHO report shows poorer health outcomes for many vulnerable refugees and migrants". *News*. July 20, 2022. https://www.who.int/news/item/20-07-2022-who-report-shows-poorer-health-outcomes-for-many-vulnerable-refugees-and-migrants

African countries make up almost half of the SSL. Regions like Africa and the Western Pacific are the most vulnerable to migration, according to the SSL. Migration impacts all source countries differently, but there are some trends. Migration is seen as generally negative for source countries, but there are also some benefits when migration is properly managed. The biggest concern for source countries is healthcare worker shortages. In South Africa, many health professionals migrate to destination countries because of staff shortages, which makes shortages in South Africa even worse. Workers who choose not to migrate are left with too many patients per professional. This results in a stressful workload and staff burnout, which is already a push factor in many donor countries.[75] The cycle makes source country healthcare systems more vulnerable and makes the issue of migration worse. In the same country, healthcare workers who do not migrate enter the private sector for better working conditions. More and more healthcare workers in South Africa choose to work in the private sector or for non-governmental organizations instead of the public sector. On top of this, in the Philippines, it is reported that workers remaining in the public sector are concentrated in urban areas, leaving rural communities underserved. These effects of migration rely on each other.

In general, migration causes shortages in countries that already do not have enough healthcare workers. In the Philippines, migration also caused uncontrolled expansion of certain health professions, especially nursing. One healthcare professional notes that a rapid increase in nursing student enrollment due to migration could not be absorbed by the healthcare system in the country. This is called saturation of the nursing field. As a result, even more nurses migrated out of the country, and nurse unemployment reached its highest. This increases the financial burden on health institutions to train nurses and fill vacant positions. Finally, some countries have poor data availability on migration patterns, so there is no way for them to develop solutions that fit their population. A 2016 study on Jamaican health worker migration found that neither Jamaica's government, its health workforce associations, nor any of its regulatory bodies formally track the migration of health workers.[76] Without proper data collection on health worker migration, it is impossible to ensure migration is ethical. The international migration of health workers advances the careers of individual workers. However, it must be handled carefully to avoid negative consequences on source countries, especially the most vulnerable to shortages.

Migration can also be a positive factor for a source country's health workforce. In each study above, health professionals also reported some benefits to working abroad, both for individual workers and for the national economy. South Africa has begun to adopt "circular migration," where health professionals work or study abroad for several years and then return to their home country. This can happen because destination countries have push factors of their own, and a worker's home culture and family ties are important pull factors. Since the decision to migrate is personal, this phenomenon depends on individual workers. However, health professionals returning from overseas work generally benefit their home country's healthcare system with new expertise and specialty training.

Furthermore, remittances can help a source country's economy indirectly. Remittances are money sent back to a migrating health worker's home country, typically back to their family, that they have earned abroad. In the Philippines, remittances have benefited the country's economy since they were formalized. They directly impact migrating workers' families by giving family members opportunities to attend school. This human development indirectly benefits the country's economy in general. However, they do not directly benefit the economy of the source country. It is important that remittances are invested properly to contribute to economic growth. Either way, there are some benefits to migration in the form of remittances and additional training for healthcare workers when migration is monitored and regulated.

Health Workforce in Rural and Remote Areas

Even though there is a trend toward urbanization in the future, almost half of the world's population lives in a rural community. Rural and remote communities have

75 Labonté, R.et.al. "Health worker migration from South Africa: causes, consequences and policy responses".
76 Tomblin Murphy, G. "The WHO global code of practice: early evidence of its relevance and effectiveness". *Human Resources for Health.* Vol. 14 (36). June 30, 2016. https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-016-0125-8

A rural health clinic in the Philippines
Credit: BhlJRama

unique challenges to healthcare access. Many factors make healthcare more challenging in rural and remote areas, like socioeconomic deprivation, the cost of health services, and even distance or lack of transport. One of the biggest barriers to healthcare access is a lack of trained and motivated healthcare professionals in rural and remote areas. As such, it is important to make sure rural communities receive the health services they deserve.[77]

While every country has diverse communities, they can be classified as urban or rural based on the United Nations' World Urbanization Prospects. However, the concept of a rural community is complex and varies depending on population size and density, economic features, and geographic characteristics. Rural and remote communities can also include unique behavioral norms and community views. Since each rural community is different, it is important to engage with them on a local level to ensure their preferences are considered in health solutions. In a set of updated guidelines released in 2021 by the WHO, the issue of the healthcare workforce in rural communities was broken down into different categories: education, regulation, incentives, and support.[78]

Less than half of rural populations have full access to essential health services. That is, around 2 billion people do not have access to health services worldwide. Differences in healthcare for urban and rural communities are so large that the concept of rural health has been studied for decades.[79] A systematic literature review of the definition of rural health in rural communities in the United States, Canada, and Australia noted that each rural community has different cultures and economic needs, but there is a broad definition of rural health.[80] In many rural areas, health is closely related to the ability to work and fulfill social roles in the community. Health is often in terms of independence and self-sufficiency. In rural communities, healthcare has different social and cultural implications than in urban areas. It is important to understand and respect the health beliefs of rural populations to develop solutions that preserve community interest. Similarly, rural communities also have a larger burden of preventable diseases than urban ones. The "rural mortality penalty" is a problem in the United States related to differences in mortality from preventable conditions

77 World Health Organization. "Imbalances in rural primary care". 2018. [PDF].
78 World Health Organization. "WHO guideline on health workforce development, attraction, recruitment and retention in rural and remote areas". Publications. May 6, 2021. https://www.who.int/publications/i/item/9789240024229
79 Rural health Info. "Healthcare Access in Rural Communities". *RHIhub*. Reviewed November 21, 2022. https://www.ruralhealthinfo.org/topics/healthcare-access
80 Gessert, C. "Rural definition of health: a systematic literature review". *BMC Public Health*. April 14, 2015. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-1658-9

in rural areas compared to urban ones.[81] Understanding what rural health means and the unique health risks present in rural areas is important for developing solutions in the rural health workforce.

One of the biggest issues in the rural healthcare workforce is maldistribution. Maldistribution means that healthcare worker shortages affect rural and remote communities more than others. These shortages are supported by data from all over the world, regardless of countries' income levels. India has more than eleven times more doctors in urban areas than in rural communities. Canada has 2.6 doctors per one thousand population in urban areas but less than one doctor per one thousand population in rural ones.[82] Similarly, Bangladesh has 1.8 doctors per 1,000 citizens in urban areas but only 0.1 doctors per 1,000 population in rural communities. This is not only limited to doctors and nurses. The same issue happens with pharmacists, health assistants, and physician assistants worldwide. Regardless of income or development level, the rural healthcare sector receives a lower supply of healthcare workers in general. There are many causes of maldistribution. In 2018, a review by WHO and the Ministry of Health in Afghanistan highlighted issues with the distribution of healthcare professionals throughout the country.[83] At the time, insecurity, harsh terrain, and some cultural barriers prevented healthcare professionals from serving rural and remote communities. Many health professionals, especially female doctors, preferred to work in Kabul for better security, transportation, education for children, and employment. The social, cultural, and even geographical concerns of healthcare workers in Afghanistan contributed to the country's limited health workforce in rural and remote areas. Furthermore, the distribution of healthcare workers is also a result of labor market changes. Around the world, the need for healthcare workers, the demand for health workers (the number of available jobs), and the supply of health workers (the number of available workers) in remote and rural areas are related to the funding available in these regions. Poor distribution of health workers often leaves rural communities underserved. No matter the cause, maldistribution of health workers prevents rural and remote communities from accessing the necessary health services.[84]

A major factor that keeps health professionals out of rural and remote communities is their education and training. Most of the world's medical schools are located in large cities. This means that most students grow up in urban areas and do not have the chance to learn about rural healthcare during medical training. As a result, most physicians find careers in larger cities, and very few practice in rural communities. Students from rural areas are the most likely to practice in rural areas after they graduate. However, the number of medical students who come from rural areas does not reflect the number of healthcare professionals needed to serve rural communities around the world. In the United States, more than 65 percent of Health Professional Shortage Areas were in rural communities as of 2023.[85] At the same time, the size and number of medical schools in the United States is increasing. This enables medical education centers to train a health workforce that can meet the needs of rural communities more effectively. However, as medical schools increase in size and number, the percentage of students interested in practicing in rural areas is decreasing. Over the past 20 years, the number of medical students from rural areas in the United States has decreased to less than five percent. The amount of medical students does not match the amount of rural communities that face health worker shortages. To increase the number of rural students in medical school, every part of medical education must work together.[86] Also called the "pipeline to practice," some researchers have pointed out that rural secondary students should be encouraged to pursue university education and healthcare training.

81 Richman, L. "Addressing health inequalities in diverse, rural communities: An unmet need". *SSM Popul Health*. April 7, 2019. https://doi.org/10.1016/j.ssmph.2019.100398
82 World Health Organization. "Increasing access to health workers in remote and rural areas through improved retention". WHO. 2010. [PDF]. https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf
83 Safi, N. et al., "Addressing health workforce shortages and maldistribution in Afghanistan." *World Health Organization*. Vol. 24(9). 2018. https://applications.emro.who.int/emhj/v24/09/EMHJ_2018_24_09_951_958.pdf?ua=1
84 Safi, N. et al., "Addressing health workforce shortages and maldistribution in Afghanistan."
85 Tulane University. "How to Improve Health Care in Rural Areas". January 17, 2023. https://publichealth.tulane.edu/blog/how-to-improve-health-care-in-rural-areas/
86 Shipman, S.A. "The Decline In Rural Medical Students: A Growing Gap In Geographic Diversity Threatens The Rural Physician Workforce". December 2019. https://doi.org/10.1377/hlthaff.2019

Around the world, select medical schools have partnered to increase the representation of rural students in their groups. THEnet (Training for Health Equity Network) is a group of eight medical schools with social accountability mandates according to WHO's guidelines for health education in the twenty-first century. These schools, located in underserved locations in Africa, Asia, Australia, Latin America, and North America, have specific goals to recruit students who practice in rural and underserved communities. In Northern Ontario, Canada, most of the population lives in rural and remote communities with diverse cultures, especially French-speaking and indigenous citizens. The Northern Ontario School of Medicine, a THEnet member school, actively recruits students of rural, remote, French speakers, and indigenous backgrounds from Northern Ontario.[87] Clinical training takes place in various community-based health service settings, and students are exposed to cases and training from physicians' perspectives in Northern Ontario. While students graduate with training sufficient for medical practice anywhere, around 70 percent of the school's graduates serve in rural communities in and around Northern Ontario. By recruiting students from rural communities in Northern Ontario and providing them with training relevant to rural communities, the Northern Ontario School of Medicine is an example of successful healthcare education for rural and underserved areas. However, access to education systems like this is often challenging in rural communities, especially in low and middle-income countries. To adequately train healthcare professionals for rural communities, governments and medical training centers must address social attitudes around rural health, resource limitations, and involvement of the health system. Education is just one way to improve the quality of the health workforce in rural areas.[88]

For any medical practice to run smoothly, healthcare professionals should feel supported at work and have decent work conditions. Workers must be supervised to ensure job satisfaction, especially in rural areas. Health workers are less inclined to apply to work in areas that lack basic supplies and professional support.[89] Without decent work conditions and proper support, retention of health workers in rural areas will continue to fall. A study of the workload of rural and urban physicians in Germany found that, on average, medical professionals in rural areas work more hours per week than their urban counterparts, especially in solo practices. This means that rural physicians running their practice in rural areas must work more weekly hours to provide the same standard of care to patients[90]. In the Scottish Highlands, research shows that health professionals in rural areas feel more job isolation than urban ones, likely because there are fewer representatives of each health profession in rural communities. For example, where a city health center may have multiple occupational therapists or physiotherapists, there may only be one in a rural area due to community size and poor retention of workers.[91] For maternal healthcare providers in rural Tanzania, healthcare workers report work environments so poor that their ability to provide care is compromised. These deficits in working conditions range from administrative delays to a lack of running water and light sources. Poor working conditions like these are a significant factor that causes healthcare professionals to leave rural areas, especially in low- and middle-income countries, where access to basic amenities is difficult. All of these issues make it more challenging to retain healthcare workers. That is, healthcare workers are not likely to stay in rural areas because their working conditions hinder their job satisfaction. This makes the issue of recruitment of health professionals to rural areas even more difficult.

In 2010, WHO released global policy recommendations to improve the health workforce in rural and remote communities. The guidelines provide a framework for

87 Strasser, RP. et al., "Canada's new medical school: The Northern Ontario School of Medicine: social accountability through distributed community engaged learning". *Acad Med.* October 2009. doi: 10.1097/ACM.0b013e3181b6c5d7.
88 Ontario. Growth Plan for Northern Ohio. September 3, 2023. https://www.ontario.ca/document/growth-plan-northern-ontario/people
89 Jaeger, Fabienne N., Bechir, Mahamat., Harouna, Moumini., Moto Daugla D., and Utzinger, J. "Challenges and opportunities for healthcare workers in a rural district of Chad". *BMC Health Services Research.* Vol. 18. January 8, 2018. https://doi.org/10.1186/s12913-017-2799-6
90 Steinhauser, Jost., Joos, Stephanie., Szecsenyi, Joachim., Miksch, Antje. "A comparison of the workload of rural and urban primary care physicians in Germany: analysis of a questionnaire survey". *BMC Family Practice.* Vol. 12. October 11, 2011. https://doi.org/10.1186/1471-2296-12-112
91 Stewart, Derek., Gibson-Smith, Kathrine., Cunningham, Scott., Pfleger, Sharon., Rushworth, Gordon. "A qualitative study of the perspectives of older people in remote Scotland on accessibility to healthcare, medicines and medicines-taking". *Int J Clin Pharm.* Vol. 40. October 2018. https://doi.org/10.1007%2Fs11096-018-0684-y

education, regulatory, financial, and support-based reform of the health workforce made specifically for rural and remote areas facing shortages. The recommendations were based on the WHO Global Code of Practice on the International Recruitment of Health Personnel, formed at the Sixty-third World Health Assembly meeting in 2010. In 2021, the WHO updated the original guidelines after reviewing a large body of literature since the 2010 document was published. Using evidence from countries implementing the original guidelines, the Guideline Development Group published new guidelines that better represented the needs of the modern health workforce. Despite this progress, there are still common challenges to the improvements suggested by WHO and the delivery of quality healthcare in rural and remote areas. Regarding education, some health researchers claim that changes to medical education must be more dramatic than WHO recommends.

Further, reforms to medical training may be slowed by the economic situation in low- and middle-income countries. This type of educational reform will require multi-sector and whole-of-government collaboration, which may result in high financial burdens. Further, the preferences of each rural community are different. Remote communities often depend on community health workers the most. This can make it difficult to introduce new health worker types or change scopes of practice to match the needs of specific rural and remote areas. One of the most difficult issues with improving the rural health workforce is strengthening working conditions and wages for health workers.[92] While financial incentives have been implemented successfully in some areas, there is a risk of unintended consequences. In Australia, evidence has shown that financial incentives do not always improve access to healthcare for patients, even if new medical practices open.

Additionally, incentives should be used sustainably. If a country cannot sustain incentives for long periods, healthcare workers' morale may decrease. This phenomenon occurred in Bangladesh in 2021 when the removal of financial incentives negatively impacted community healthcare workers' motivation to deliver quality care. WHO warns against using financial incentives due to administrative burden, lack of equity, and payment delays. Improving access to healthcare services in rural and remote communities is a complex problem that requires cross-sector collaboration and solutions that preserve the integrity of the areas they serve. With a multipurpose approach to healthcare access in underserved areas, rural communities can receive the quality healthcare they deserve.

Fair Hiring of Health Workers

For the health workforce to function properly, all health workers must have proper working conditions and wages. Gendered challenges in the health workforce occur in all countries at all development levels. The largest challenge in gender equity for the health workforce is the fair treatment of women in healthcare jobs. A 2019 report by the WHO, the Global Health Workforce Network, and Women in Global Health divided the issue into four main themes: occupational segregation, leadership, decent work, and the gender pay gap (GPG).[93] Each theme of gender differences in the health workforce is an important part of equity in healthcare.

Occupational segregation, the separation of different groups into different careers based on their gender, race, or class, is a major driver of inequity in the health workforce. [94]The ILO states that occupational segregation divides groups based on gender and class. It also fuels bias and discrimination in the workplace.[95] It exists in all countries. There are two types of occupational segregation: horizontal and vertical. Horizontal segregation means that certain jobs are dominated by one gender or another. Vertical segregation means that one gender or another takes up higher-ranking positions than another.[96]

92 Gessert, C. et.al. "Rural definition of health: a systematic literature review". *BMC Public Health*. 2015. https://bmcpublichealth.biomedcentral.com/counter/pdf/10.1186/s12889-015-1658-9.pdf
93 World Health Organization, Delivered by women, led by men: a gender and equity analysis of the global health and social workforce. (Geneva: World Health Organization, 2019), https://apps.who.int/iris/bitstream/handle/10665/311322/9789241515467-eng.pdf.
94 Hegewisch, A., Hartmann, H. "Occupational Segregation and the Gender Wage Gap: A Job Half Done". *Institute for Women's Policy Research*. January 2014. https://iwpr.org/wp-content/uploads/2020/08/C419.pdf
95 International Labour Organization, Labour inspection, gender equity, and non-discrimination in the Arab States: guide book. (Geneva: International Labour Organization, 2014), https://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/publication/wcms_249296.pdf.
96 Alina Verashchagina and Francesca Bettio, Gender segregation in the labour market: root causes, implications and policy responses

Horizontal segregation can prevent women from entering the healthcare jobs they want. While women make up many healthcare jobs, they are often concentrated in specific sectors. Globally, women make up most of the health workforce, but most of their jobs are in nursing and midwifery. This grouping of female healthcare workers into particular specialties and sectors can cause lasting effects on their working conditions and career paths.[97] Meanwhile, very few female health workers are surgeons.[98] A report by the Institute for Women's Policy Research found that women take up more nursing and medical assistant roles, but less than half of physicians and surgeons in the United States.[99] Similarly, the European Commission's Expert Group on Gender and Employment found that in France, gynecology, pediatrics, and dermatology are female-dominated. At the same time, acute and surgical specialties like cardiology and general surgery are male-dominated. The report claims that gender stereotypes cause these differences, as specialties that are female-dominated are seen as "caring" and "feminine." The same phenomenon is observed in the nursing and midwifery sector.[100] These differences in sector and specialty composition are often based on gender stereotypes and cause other long-lasting challenges for women in healthcare.

Vertical segregation can prevent women health workers from reaching tertiary care or academic healthcare roles. Women comprise around 70 percent of the health workforce, but only a few enter higher-status roles. Also, half of the GDP women contribute to the healthcare sector is unpaid or informal work.[101] This is likely because women are clustered into low- or non-paying roles in healthcare. In Sub-Saharan Africa, this issue is important in the fight against HIV/AIDS and has been prevalent for almost 20 years. [102] A UNAIDS Expert Group Meeting report found that, in South Africa, over 90 percent of community caregivers are women, and women carry out eight times more caregiving work for illnesses than men do.[103] This work is often unpaid and informal. Because of this, women who engage in unpaid or volunteer community caregiving often do not have access to leave, pensions, or insurance since these are associated with paid work.[104] Issues of decent working conditions and social security for women and girls in HIV/AIDS care have created a culture of poverty that specifically targets women, according to the Voluntary Services Overseas program manager for Zambia. Women's equity in the health workplace is also not protected in all countries. Women-dominated healthcare jobs often have lower wages, fewer decision-making opportunities, and poorer training for employees.[105] In an analysis of 140 global health organizations, the Global Health 50/50 Report states that only 43 percent have policies for workplace gender equality.[106] The World Health Assembly must take action to protect women's rights to work in healthcare.

For fair decision-making in the health workforce, women must occupy enough leadership roles to have a say in healthcare. The World Health Organization estimates that only one in four of the most influential governance roles in global health agencies are occupied by women, even though more than half of the global health workforce comprises women. It is estimated that around 80 percent of global health boards are chaired by men. Although female health workers have a large impact on the healthcare sector, their opportunity for

in the EU. (Luxembourg: Publications Office of the European Union, 2009). https://op.europa.eu/en/publication-detail/-/publication/39e67b83-852f-4f1e-b6a0-a8fbb599b256.
97 World Health Organization, *Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.*
98 World Health Organization, *Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.*
99 Hegewisch, Ariane, and Heidi Hartmann, Occupational Segregation and the Gender Wage Gap: A Job Half Done. (Institute for Women's Policy Research, 2014). https://iwpr.org/wp-content/uploads/2020/08/C419.pdf.
100 Verashchagina and Bettio, *Gender segregation in the labour market: root causes, implications and policy responses in the EU.*
101 World Health Organization, *Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.*
102 Newman, C.J. et.al. "Occupational segregation, gender essentialism and male primacy as major barriers to equity in HIV/AIDS caregiving: Findings from Lesotho". https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_457317.pdf
103 Constance J Newman, Linda Fogarty, Lucia Nthabiseng Makoae, and Erik Reavely, "Occupational segregation, gender essentialism and male primacy as major barriers to equity in HIV/AIDS caregiving: findings from Lesotho," *International Journal for Equity in Health* 10, no. 1 (June 2011): 24. https://doi.org/10.1186/1475-9276-10-24.
104 Gita Sen and Piroska Östlin, "Gender inequity in health: why it exists and how we can change it," Global Public Health 3, no. 1 (April 2008): 1-24. https://doi.org/10.1080/17441690801900795.
105 World Health Organization, Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.
106 "Global Health 50/50 Report (2018)." Global Health 5050, accessed July 21, 2023, https://globalhealth5050.org/report/.

promotion or leadership is limited compared to their male counterparts.[107] Globally, women face the burden of disease disproportionately because of gender bias in healthcare. Involving women in health leadership helps to combat this issue.[108] A report by the WHO, the World Bank, the Ministry of Health, Rwanda, and other global health organizations found that the number of women in health leadership roles corresponds to reduced infant and maternal mortality rates.[109] This is only one example of involving women in health decision-making. The WHA itself also faces gender imbalance in its delegations. Although there has been a slow increase in the number of Chief Delegate positions being held by women in the past year, only about one-third of member state delegations are led by women as of the 76th World Health Assembly meeting.[110]

Gender pay equity, also called equal pay, was discussed in the ILO Equal Remuneration Convention of 1951 (No. 100). The Convention states that workers should be paid the same amount for doing the same work without sex discrimination. A 2022 report by the WHO and the ILO confirms that women are overrepresented in lower-paying healthcare jobs, while men are overrepresented in higher-paying jobs. The report also found that the gender wage gap in healthcare is wider than in non-healthcare sectors.[111] Men show disproportion in the top decile of healthcare jobs, making the wage gap even more drastic. Globally, the health and care gender pay gap is estimated to be around 24 percent.[112] This gap is caused by differences in men's and women's education, working time, and job type. However, a large portion of the wage gap is not explained by occupational segregation. The WHO predicts that this part of the wage gap is due to gender discrimination and fewer opportunities for career advancement for women in healthcare jobs.[113]

Sustainable Development Goals Target 8.5 aims to achieve "full and productive employment" and "decent work for all women and men" by 2030. Many healthcare jobs today do not

107 World Health Organization, *Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.*
108 United Nations, "Women's Leadership in Promoting Global Health and Well-Being." *News release*, May 23, 2020. https://www.un.org/en/un-chronicle/women%E2%80%99s-leadership-promoting-global-health-and-well-being.
109 World Health Organization, *Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.*
110 Women in Global Health, "Annual count of women Chief Delegates." News release, May 23, 2023. https://womeningh.org/wha76-gender-count/.
111 World Health Organization and the International Labour Organization, "The gender pay gap in the health and care sector: a global analysis in the time of COVID-19 "(Geneva: World Health Organization and the International Labour Organization, 2022).
112 World Health Organization and the International Labour Organization, "The gender pay gap in the health and care sector."
113 Mathieu Boniol et al., Gender equity in the health workforce: Analysis of 104 countries. Working paper 1. (Geneva: World Health Organization, 2019), https://apps.who.int/iris/bitstream/handle/10665/311314/WHO-HIS-HWF-Gender-WP1-2019.1-eng.pdf.

Doctors hosting a medical day for women in the West Bank

Credit: Physicians for Human Rights - Israel

meet the standards for decent work because of the gender pay gap. The ILO and the European Commission's Directorate-General for International Cooperation and Development outlined decent work in healthcare in 2019. The healthcare sector must provide decent training, career opportunities, occupational health, and safety for all workers.[114] It is often more difficult for women to adapt to healthy jobs' challenging hours and achieve work-life balance. A report on caregiving and workplace demands from Stanford University revealed that gender-based discrimination is present across career stages and job types in the healthcare sector. It found that women were more likely to have difficulties with work-life balance than men in healthcare jobs. As long hours and inflexible work schedules become more demanding over time in the healthcare sector, women are pushed into part-time work or female-dominated health professions.[115] Often, women who are caregivers sacrifice job flexibility and earnings so that they can take time off of work to meet home demands.[116] These factors push gender-based discrimination even further as a worker's career advances. In general, health workforce training, hiring, scheduling, and even promotions are not set up to accommodate workers who are caregivers in the home.[117] Decent work conditions and fair employment opportunities for all health workers are necessary for access to quality healthcare.

Sexual harassment and gender discrimination are also frequent in the healthcare sector and present risks to the mental well-being and safety of health workers. Around the world, different evidence points to women bearing the impact of sexual harassment at work in healthcare jobs. The 2019 report by the WHO, the Global Health Workforce Network, and Women in Global Health noted that sexual harassment in the health workplace can involve colleague or patient perpetrators, and virtually all countries are affected by the issue.[118] In Nepal, nearly half of healthcare workers surveyed reported some form of verbal or physical abuse, and roughly two-thirds of the incidents involved senior male staff offenders.[119] Workplace violence is not limited to healthcare staff only. However, in Kenya, health workers providing HIV testing to female community members have been met with threats of violence by male community members, at times leading to security concerns for healthcare facilities.[120] Unfortunately, workplace violence in the healthcare sector has only worsened throughout the COVID-19 pandemic.[121] Healthcare workers in a 2022 study in Turkey reported higher levels of burnout and emotional exhaustion from workplace violence during the COVID-19 pandemic than before 2020.[122] According to the Council of Foreign Relations' Women's Workplace Equality Index, there are still 59 countries around the world with ranging income and development levels that do not have any legislation prohibiting sexual harassment at work, including Iran, the United Arab Emirates, and Russia.[123] Although lack of legal protection against sexual harassment in the workplace is present in various countries regardless of their income or health workforce structure, the tragic effects of workplace violence are the worst in conflict-affected countries and remote settings, where female health workers are most vulnerable.[124] In 2017, the WHO, ILO, and the OECD strengthened their

114 International Labour Organization, "Ensuring decent work in the health sector," *News release*, April 1, 2019, https://www.ilo.org/brussels/information-resources/WCMS_694961/lang--en/index.htm.
115 Shelley J. Correll, "Redesigning, Redefining Work," *Work and Occupations* 41, no. 1 (February 2014): https://doi.org/10.1177/0730888413515250.
116 Claudia Goldin and Lawrence F. Katz, "The Cost of Workplace Flexibility for High-Powered Professionals," The ANNALS of the American Academy of Political and Social Science 638, no.1 (November 2011): https://scholar.harvard.edu/sites/scholar.harvard.edu/files/goldin/files/the_cost_of_workplace_flexibility_for_high-powered_professionals.pdf.
117 World Health Organization, Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.
118 World Health Organization, Delivered by women, led by men: a gender and equity analysis of the global health and social workforce.
119 Sapkota Bhim Prasad and Khil Prasad Bhusal, "Work place sexual harassment among female health workers in grass-root level health institutions in Nepal," *Occupational Medicine and Health Affairs* 3, no. 4 (August 2015): https://www.omicsonline.org/2329-6879/2329-6879.S1.022_022.pdf.
120 Rosalind Steege et al., "How do gender relations affect the working lives of close to community health service providers? Empirical research, a review and conceptual framework," *Social Science & Medicine* 209, (July 2018), 10.1016/j.socscimed.2018.05.002.
121 Zhang et al., "Workplace violence against healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis," *Environmental Science and Pollution Research International* 30, no. 30 (May 2023), https://doi.org/10.1007/s11356-023-27317-2.
122 Gülin Özdamar Ünal, Gökçe Iscan and Onur Ünal, "The occurrence and consequences of violence against healthcare workers in Turkey: before and during the COVID-19 pandemic," *Family Practice* 39, no. 6 (November 2022), 1001-1008, https://doi.org/10.1093/fampra/cmac024.
123 "Top and Bottom Countries in Women's Workplace Equality," *Women's Workplace Equality Index*, accessed July 22, 2023, https://www.cfr.org/legal-barriers/country-rankings/.
124 Sophie Witter et al., "The gendered health workforce: mixed methods analysis from four fragile and post-conflict contexts," *Health Policy*

commitment to preventing workplace violence against women healthcare workers at the Seventieth World Health Assembly meeting.[125] Despite this progress, action is required to protect healthcare workers, especially women, from violence at work.

Fair hiring and treating health workers is one of the oldest challenges in the health workforce. When all healthcare professionals have equitable job opportunities, working conditions, and fair pay, universal health access is easier to achieve.

Current Status

Unequal Access to Health Education and Training

Education and training prepare healthcare workers with the necessary skills, competencies, and knowledge to render services and provide safe treatment. However, this facet of strengthening the health workforce is under severe strain.[126] In recent years, there has been an increased female representation in the health workforce, which is getting women's attention for meeting the global goals for UHC and the UN's SDGs 30.[127] Sadly, despite these results, women's employment is still mainly taking up lower-paid jobs like nursing and midwifery, while the main dominate in medicine in most countries. In addition, women are less likely to have a specialty, but they are still very well represented in health areas such as pediatrics, general practice, and gynecology. Finally, decision-making and leadership healthcare positions are mainly filled by men. [128]

In addition to the WHO's gender and equity analysis of the health and social workforce known as "Delivered by Women, Led by Men," a 2021 study found a need for HRH policies and strategies to increase gender equity. In the case of nursing, even though the pattern of men joining this workforce has increased and professional status benefits, there is still a concern that in very patriarchal societies, male nurses will have preferred access to senior or leadership positions. This can increase female nurse migration to other countries and lead to future job shortages. Different cultural norms have affected women's mobility and recruitment since they carry the burden of gender expectations and supervisor stereotypes. Finally, many women in this workforce have been penalized for their reproduction roles since managers believe that maternal responsibilities hurt a woman's productivity. However, contrary to this belief, women perceive their education and careers as a priority, and they are willing to take on the challenge of managing education and family while trying to get a leadership position. [129]

One of the several issues that the health workforce is facing regarding education is that it needs to be more inaccessible and better quality for many. Many countries in the global south need healthcare education programs that meet the needs of their population. Likewise, many need more health professionals to teach others and quality programs. There is an issue of preparing effective doctors and nurses who can provide a high standard of care. Existing third-party education and technical and vocational education and training systems in low- and middle-income countries continue to fall short of ensuring effective healthcare education and training. For example, in Eastern, Central, and Southern Africa, not only are facilities lacking, but so is a comprehensive quality assurance framework. Nursing education and training involves curriculum reform, training infrastructure enhancement, and faculty shortage resolution.[130] The lack of affordable and accessible health education programs can limit the pool of possible healthcare workers, creating workforce shortages and reducing access to treatment for vulnerable people.

Another issue that is faced in the educational sector of

and Planning 32, no. 5 (December 2017), https://doi.org/10.1093/heapol/czx102.
125 World Health Organization, Delivered by women, led by men: a gender and equity analysis of the global health and social workforce. (2019)
126 Strasser R., Neusy, A-J. "Context counts: training health workers in and for rural and remote areas". *Bull World Health Organ.* 2010. doi: 10.2471/BLT.09.072462.
127 Ayaz, B. et.al. "Participation of women in the health workforce in the fragile and conflict-affected countries: a scoping review". *Human Resources for Health.* August 4, 2021. https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-021-00635-7
128 Ayaz, B. et.al. "Participation of women in the health workforce in fragile and conflict-affected countries: a scoping review".
129 Ayaz, B. et.al. "Participation of women in the health workforce in fragile and conflict-affected countries: a scoping review".
130 Nobuyuki Tanaka and Koji Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help," *World Bank,* last modified October 27, 2022, https://blogs.worldbank.org/education/world-needs-more-and-better-nurses-heres-how-education-sector-can-help#.

healthcare is that individuals in underprivileged communities frequently face challenges in acquiring the skills and knowledge needed for healthcare careers. Specifically, the variations in the education standards provided across the world. This is a result of historical and socio-economic factors. Those located in wealthier countries have greater flexibility and a greater abundance of funds allocated for educational materials, resources, and teachers than those in lower-income ones. As a result, students with higher socio-economic status are exposed to better facilities, lower dropout rates, more educational options, and higher salaries.[131] Take note of the WHO Global Code of Practice on the International Recruitment of Health Personnel, which indicates that 15 percent of health and care workers worldwide are working outside their birth country or their qualifications.[132]

Underinvestment is another issue in accessing quality professional health education in underinvestment. Underinvestment in healthcare educational programs has far-reaching consequences for the quality and accessibility of healthcare services. Inadequate funding in educational programs leads to a shortage of workers. Insufficiently funded educational programs and resources may also lead to outdated subjects and inadequate training facilities, leaving healthcare students ill-prepared to address the evolving challenges of modern healthcare. Furthermore, underinvestment may discourage capable and talented people from pursuing professions in healthcare owing to high tuition prices, limited scholarship possibilities, and the possibility of incurring significant student loan debt. Financial stress induced by student loan payments can lead to burnout and impair healthcare professional workforce retention. The demanding nature of their work, combined with the pressure of debt payback, might lead to increased stress and decreased job satisfaction. All of this exacerbates labor shortages, particularly in impoverished communities with inadequate healthcare access.[133] The World Bank has invested over USD five billion in tertiary education and skills training in more than 50 countries to promote nurse education and training while also amassing global expertise. Countries are urged to enhance their postsecondary education institutions to acquire the professional knowledge required to guide governmental and private sector growth, as well as to generate the physicians, nurses, teachers, scientists, and managers required to support their expanding economies.[134] More significant investments are still needed on a national, regional, and global scale.

At all levels, international development institutions must continue to discover fresh insights and promote creative methods. One approach to build on existing efforts is to harness current initiatives to promote healthcare workforce development by amassing country, regional, and global knowledge, producing global public goods, and adapting them to the local environment (for example, Generation's online healthcare worker training). Instruments to help train health professionals include training observation tools, training capacity and needs assessment tools, templates for training curricula and program creation, and knowledge packets.[135] We must also use practical, promising, and creative techniques to improve access and quality of nursing education. Some nations, for example, are developing scholarship programs for healthcare workers who commit to serving after their degrees to entice students to the nursing industry. Developing nursing skills is difficult since it requires the availability of labs, hospitals, and equipment, which can be expensive to acquire and maintain and expose students and nurses to danger. Many universities worldwide invest in virtual laboratories to help students improve their nursing skills more affordably. The use of virtual reality training has shown enormous potential in the field of health, particularly in nursing, because it allows trainees to practice many operations in a safe setting at a low cost.[136] The World Bank has also helped to increase the

131 Tiago Santana, "Access to Education: The Impact of Inequality on Education," *Graygroupintl.com* (Gray Group International LLC, March 14, 2023), https://www.graygroupintl.com/blog/impact-of-inequality-on-education-access-and-quality.
132 WHO Global Code of Practice on the International Recruitment of Health Personnel: Fourth round of reporting". *News release.* June 2, 2022. https://www.who.int/news/item/02-06-2022-who-global-code-of-practice-on-the-international-recruitment-of-health-personnel--fourth-round-of-reporting
133 "How Student Loans Affect Healthcare Professionals," *Marvel Medical Staffing,* accessed September 1, 2023, https://marvelmedstaff.com/how-student-loans-affect-healthcare-professionals/.
134 Tanaka and Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help." (2022)
135 Tanaka and Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help."
136 Tanaka and Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help."; https://openknowledge.worldbank.org/entities/publication/77a74b0e-7030-5e69-bd90-49a94f244671

quality of nursing education in Vietnam, particularly through the use of IT.[137] Addressing underinvestment in healthcare educational programs is crucial for building a robust and responsive healthcare workforce, improving the overall quality of care, and ensuring equitable access to healthcare services for all members of society. Collaborations between governmental institutions, private healthcare providers, and charitable organizations to support and extend healthcare education projects in low-income areas are encouraged.

Likewise, advocacy for lower tuition and fees for healthcare education programs, particularly those at public institutions. Subsidies and financial aid from the government can make education more affordable. Creating loan forgiveness programs for healthcare graduates who commit to working in underprivileged communities for a set length of time can be a doable solution to help relieve the shortage. [138] This can encourage people to work where they are most needed. Lastly, advocating for policy changes at the local and federal levels to devote greater resources to underprivileged communities' healthcare education and to motivate institutions to prioritize these regions in their recruiting and training efforts is also crucial to tackling the issue. Adequate funding can support the development of innovative educational approaches, promote diversity in the healthcare workforce, and ultimately enhance the health and well-being of communities.

According to a Mayo Clinic study, more than three in five physicians reported some type of burnout manifestation in 2021. Before COVID-19, around 35-54 percent of physicians reported burnout symptoms to the National Academy of Medicine. Another important factor in improving access to health education is encouraging people to pursue health-related careers. Encouraging people to choose healthcare vocations is critical. First and foremost, a strong Healthcare staff is required to meet the increasing demand for medical services, particularly with aging populations and rising healthcare costs. Some ways to improve burnout is showing validation and appreciation to the workers, since they may be lacking motivation as well. A way governments can help is by trying to offer student loan forgiveness programs to healthcare workers, since student loans make up the second-largest source of consumer debt, according to Forbes.[139] People can be encouraged to pursue health-related careers by promoting student benefits, like scholarships or grants. It can also promote work facilities with the necessary equipment

137 Tanaka and Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help."
138 McPake, B. et al., "What steps can improve and promote investment in the health and care workforce?" *Health Systems and Policy Analysis. World Health Organization.* 2023. [PDF]
139 Awan, O. "Healthcare Worker burnout Is Rampant - Here's What Should Be Done". *Forbes.* March 8, 2023. https://www.forbes.com/sites/omerawan/2023/03/08/healthcare-worker-burnout-is-rampantheres-what-should-be-done/?sh=34c7d73e494c

Dr. Zbigniew Religa after a 23-hour heart transplant. Long, stressful hours contribute to burnout

Credit: National Geographic

and resources. This way, people may feel more motivated to enter the field since a functioning workspace means more probability of doing the job effectively without problems such as being overworked, poor management, and being abused in the workplace. Encouraging and recruiting people from different backgrounds may also be beneficial. Recruiting and training more students who reflect their communities. People from underrepresented groups may feel inspired to see people who share their identities and origins.[140]

In many ways, the education and training sector, in collaboration with the health sector, can improve healthcare training. For example, the higher education and health sectors can work together to develop competency-based training courses to increase the health workforce's quality.[141] Furthermore, certification of educational institutions and regulation of health worker practice are critical methods for ensuring the quality and sustainability of the health workforce, which is critical to achieving Universal Health Coverage (UHC).[142] To improve quality assurance and skill portability, the healthcare system could develop and scale up professional standards for healthcare practice, as well as certification mechanisms (global, regional, and national) to assess these standards so that nurses and doctors can use their skills across borders.[143] improving unequal access to health education and training could also include expanding scholarship and grant programs and fostering mentorship programs and programs to support students with difficult social and economic backgrounds in pursuing healthcare careers.[144] In 2019, the World Health Organization explained that to bridge the gap, digital and online health education platforms eliminate access gaps by making educational resources more available at a major scale. However, issues such as internet access and digital literacy must be addressed as well.[145]

Healthcare professionals, such as doctors, nurses, pharmacists, and allied health workers, need comprehensive medical education to understand medical concepts, disease processes, patient care protocols, and ethical practices. And it does not stop there. While primary and secondary education are vital in creating the next generation of the health workforce, education and training must remain relevant and adaptable. Education programs must be aligned with current healthcare trends, technological advancements, and evolving patient needs. With medical knowledge constantly evolving, education systems should be able to adapt along with them to ensure that the practices of healthcare workers remain effective and competent. Finally, strengthening education and training in underserved regions can contribute to addressing global health disparities. By training local healthcare workers, these areas can build self-sufficiency and provide essential care to their communities. Healthcare education should be the priority, emphasizing healthcare as a mainstream career path. Additionally, it is essential that discussions regarding the unequal distribution of those with access to healthcare-education) versus those without access be had.

Case Study: Healthcare Emergencies in Africa

In the African Region, natural disasters are still a big challenge that causes public health emergencies and emerging and re-emerging infectious diseases. In general, African health systems are fragile and vulnerable, especially because they have weak health governance, insufficient health infrastructure, essential medicines and technology, health professional shortages, and limited financing capacity. Ever since 2016, the continent has recorded increasing frequencies of infectious disease outbreaks. In that year, there were 58 outbreaks recorded, and between 2017 and 2020, there were 415, which accounts for more than 100 outbreaks each year. Before the COVID-19 pandemic, outbreaks in Africa included mostly cholera, measles, dengue, Ebola, yellow fever, malaria, meningitis

140 Caluori, A. "Burnout in healthcare: risk factors and solutions". *Supporting Occupational Health and Wellbeing Professionals.* July 2023. https://www.som.org.uk/new-strategy-needed-tackle-healthcare-burnout-crisis
141 UNESCO. "Reimagining our futures together: a new social contract for education". *International Commission on the Futures of Education.* 2021. [PDF]. https://unesdoc.unesco.org/ark:/48223/pf0000379707.locale=en
142 WHO. "Universal health coverage (UHC)". Fact Sheets. June 29, 2023. https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc)
143 Tanaka and Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help."
144 WHF. "The Road to UHC: Why Integration of Circulatory Health Interventions in Primary Care is Essential". *World Heart Federation.* June 21, 2023. https://www.world-stroke.org/assets/downloads/The-Road-to-UHC_1.pdf
145 World Health Organization. "Primary Health Care on the rRoad to Universal Health Coverage". 2019. https://apps.who.int/iris/bitstream/handle/10665/328913/WHO-HIS-HGF-19.1-eng.pdf?sequence=1&isAllowed=y

and many others. Even though Africa was one of the continents with the fewest cases and deaths reported due to COVID-19, in reality, the burden of the pandemic is probably under-reported since there was limited testing capacity and surveillance systems in the Region.[146]

Health workers are at the heart of public health emergency prevention, preparedness, response, and recovery since their actions help promote, protect, and improve health. There are currently health workforce challenges, mainly due to staff shortage, which is expected to hit 6.1 million by 2030. Since Africa has faced many public health emergencies in the last few years, this has also affected the healthcare workforce in different areas. Having a health professional shortage caused available staffers to work long hours and deal with a lot of workload and fatigue that eventually affected their mental health and well-being, increased burnout, and developed non-communicable diseases. The issue of targeting health workers' response to emergencies leaves their primary tasks on the side, which creates a gap that needs to be filled since it is increasing the staff shortage prevalence. Most of the time, health workers who are repurposed or relocated also increase the workload on current health workers and affect their physical and mental health.[147]

Talking about specific areas in the African Region, one worth analyzing is Nigeria. In particular, the country's health workforce challenges include the bad distribution of available workforce and disadvantages in rural areas, northern country zones, and primary healthcare facilities. For context, in 2014, with the help of the Canadian Government and WHO, the program "Enhancing the Ability of Frontline Health Workers to Improve Health in Nigeria" was created. Its purpose was to improve health outcomes of infants, children, women, and men by making frontline health workers' frontline capacities stronger. This was to help workers deliver maternal, neonatal, and childcare services at the primary level, and it also helped develop the 2020 National Human Resources for Health Policy and Human Resources for Health Strategic Plan 2015-2025. This plan aligns with global, regional, and national strategies. These documents have helped to support the country to work towards achieving the UN's third Sustainable Development Goal and UHC.[148]

In March 2023, the Africa CDC launched a Public Health Emergency Management Fellowship as a part of its strategic commitment to broaden workforce development under a new public health order. The purpose of the fellowship is to foster a specialized African public health workforce to coordinate and lead preparedness efforts and responses to public health emergencies in the continent.[149] In 2021, a study reviewed women's participation in the healthcare workforce, especially in Fragile and Conflict-Affected Countries/States (FCASs). The countries with the most female nurses were Sierra Leone, Zimbabwe, and Guinea-Bissau. As for female physicians, Mozambique was the country with the highest number, followed by Zimbabwe as of 2020.[150]

A 2022 study showed a serious health worker staff shortage in the continent, causing health access and provision to fall short. These shortages are coming from different factors such as inadequate training capacity, quick population growth, international migration, weak governance of the workforce, career changes, and poor health personnel retention. It is expected that the shortage will reach 6.1 million by 2030, which is a 45 percent increase from 2013, which was when the last projections were made. The WHO Regional Director for Africa warns that this shortage will continue to affect present issues in the region like maternal and infant mortality, infectious diseases, noncommunicable diseases, and giving basic services like vaccination a bigger challenge to be tackled.[151]

146 Okoroafor, SC. et al., "Preparing the health workforce for future public health emergencies in Africa". *BMJ Global Health*. February 2022. http://dx.doi.org/10.1136/bmjgh-2021-008327
147 Okoroafor, SC. et al., "Preparing the health workforce for future public health emergencies in Africa".
148 Zurn, P. et al., "The importance of strengthening the health workforce in Nigeria to improve health outcomes". *Journal of Public Health*. March 2021. https://doi.org/10.1093/pubmed/fdab012
149 Africa CDC. "Africa CDC launches Public Health Emergency Management Fellowship for African health professionals". *African Union*. Press Release. March 18, 2023. https://africacdc.org/news-item/africa-cdc-launches-public-health-emergency-management-fellowship-for-african-health-professionals/https://africacdc.org/news-item/africa-cdc-launches-public-health-emergency-management-fellowship-for-african-health-professionals/
150 Ayaz, B. et al., "Participation of women in the health workforce in the fragile and conflict-affected countries: a scoping review". *Human Resources for Health*. August 4, 2021.
151 WHO Africa. "Chronic staff shortfalls stifle Africa's health systems: WHO study". *World Health Organization African Region*. June 22,

Another study that supports these findings is published in the British Medical Journal of Global Health. It shows that the African Region has a 1.55 health workers per 1000 people ratio, which is insufficient to assist the region's needs. According to WHO, the recommended ratio should be 4.5 health professionals per 1000 people to deliver basic health services and achieve UHC. Only countries such as Mauritius, Namibia, Seychelles, and South Africa have gone over the worker-to population ratio. This is because the workforce is unevenly distributed across the continent, since there are countries like Niger. Who have 0.25 per 1000 people, and Seychelles who have 9.15 workers per 1000 people, and these are the lowest and highest scoring countries, respectively.[152] This study provided results for the health professionals distribution in the region, showing that 37 percent of these workers are nurses and midwives, 14 percent were community health workers and other types of health workers, 12 percent were administrative and support staff, 10 percent were laboratory personnel and nine percent were medical doctors. In addition, 85 percent of health workers belong to the public sector.[153] Finally, this BMJ study highlights how ensuring universal access to healthcare needs adequate, qualified, fairly distributed, and, most importantly, motivated health workers. The key challenge is to address how adequately skilled health workers respond to UHC needs, even though there have been regional and country efforts to improve.

Every year, there are at least 100 health emergencies in Africa, ranging from different disease outbreaks to human-made or natural disasters. With this, many health emergency partners seek ways to reform the continent's crisis response mechanisms. During the 75th World Health Assembly, member states and health emergency partners met in May 2022 to look for ways to address gaps such as the need for a specific global emergency health workforce, equal access to vaccines, oxygen, and other essential drugs, and more investment in the health-related infrastructure. In 2017, there used to be 131 days of response time against a disease, but the number of days decreased to 45 in 2019, proving there has been some progress regarding health emergency response. [154]

The Horn of Africa, which is a region located on the East side of the continent, is also known as the Somali peninsula.[155] It has been going through the worst droughts in recent years. Currently, there are around 15 to 20 million people who have been severely affected in Kenya, Somalia, and Ethiopia. Humanitarian emergencies such as this one increase the risk of disease outbreaks and nutritional crises, which causes more harm to the already burdened health systems in the region. There has been help provided by the African CDC, WHO, and the Bill & Melinda Gates Foundation, and they are paving the way for a health-secure Africa. [156]

In 2021, a report was released that showed that less than half of Africa's citizens (around 615 million people) have access to the healthcare they need, since the continent's health services quality service is normally poor. Family planning needs of half of the continent's women and children, especially girls, are unmet. This report is based on Africa's progress toward achieving UHC, and it was released after the Africa Health Agenda International Conference in August 2021. The report also states that around 97 million people in Africa go through catastrophic healthcare costs, especially in countries such as Sierra Leone, Egypt, and Morocco. As a result of these high costs, at least 15 million people will be pushed into poverty per year. According to Dr. Tedros Adhamon Ghebreyesus, the WHO Director-General, achieving UHC needs investments in strong and resilient health systems, especially in primary services. There should be an emphasis on promoting health and preventing diseases overall. In addition, ensuring a reliable supply of safe, effective, and high-quality medicines across the countries is an important part of achieving universal health coverage. The World Health Organization and the African CDC have been working together to establish the African

2022. https://www.afro.who.int/news/chronic-staff-shortfalls-stifle-africas-health-systems-who-study
152 WHO Africa. "Chronic staff shortfalls stifle Africa's health systems: WHO study".
153 Ahmat, A. et al., "The health workforce status in the WHO African Region: findings of a cross-sectional study". BMJ Global Health. Vol. 7 (1). 2022. https://gh.bmj.com/content/7/Suppl_1/e008317
154 World Health Organization. "WHO, partners seek to reboot Africa's health emergency response". *World Health Organization Africa*. June 2, 2022. https://www.afro.who.int/news/who-partners-seek-reboot-africas-health-emergency-response
155 Britannica. "Horn of Africa". Britannica. Updated September 5, 2023. https://www.britannica.com/place/Horn-of-Africa
156 World Health Organization. "WHO, partners seek to reboot Africa's health emergency response". *World Health Organization Africa*. June 2, 2022. https://www.afro.who.int/news/who-partners-seek-reboot-africas-health-emergency-response

Women and children waiting to be seen at a free health clinic in Kismayo, Somalia

Credit: AMISOM Public Information

Medicines Agency (AMA) in recent years. This is an agency that is expected to help improve access to medicines, since there are countries that cannot regulate medication themselves within the continent.[157]

The importance of health management relies on different areas for improvement. As an example, Africa's life expectancy used to be around 40 in the 1960s and is currently 64. This is due to correctly managing diseases such as malaria and reproductive health services. What we learned from COVID-19 was that simple hygiene practices like washing hands helped reduce not only COVID-19 but also diarrhea and other diseases. COVID-19 also helped raise awareness of people's potential and vulnerability against public health emergencies. These are only simple proofs of the impact good health practices can have on preventing and reducing the impact of diseases and other health emergencies.[158]

Dr Jean Kaseya, the African CDC Director General, has called for efforts to protect the population of the African region and ensure that citizens have access to high-quality health products with the help of strengthening local manufacturing. Dr Kaseya showed that despite three years of dealing with the COVID-19 pandemic, Africa still faces an uncertain future regarding anticipating and preparing to respond to health challenges. By using local manufacturing in medical products, there is an opportunity to support economic growth, strengthen health security, and, therefore, improve health outcomes. In addition to supporting health, local manufacturing helps build a sustainable market demand that can be fulfilled long-term, increases supply security, and reinforces regulatory systems. Therefore, there is a need for African Union Member States to make investments and coordinate initiatives to help the manufacturing sector.[159]

Sustainable Development Goals

The United Nations created the Sustainable Development Goals (SDGs) to achieve the 2030 agenda of increasing sustainability in different areas. These were adopted in 2015 as a universal call to action to end poverty, protect the environment, and allow people to enjoy peace and prosperity to complete their general development and live in healthy conditions. There are 17 SDGs, each addressing different needs or areas of conflict, such as poverty, hunger, discrimination,

157 Cullinan, K. "Universal Health Coverage: Only Half of Africans Have Access to Health Care". Universal Health Coverage. August 3, 2021. https://healthpolicy-watch.news/only-half-of-africans-have-access-to-health-care/
158 Cullinan, K. "Universal Health Coverage: Only Half of Africans Have Access to Health Care". Universal Health Coverage. August 3, 2021. https://healthpolicy-watch.news/only-half-of-africans-have-access-to-health-care/
159 Africa CDC. "Africa Health ExCon 2023: Showcasing Africa's potential for investment in manufacturing, pharmaceutical business and innovative health technology". Africa CDC. Press Release. June 9, 2023.

health access, gender equality, innovation, sustainability, and institutions.[160]

One of the SDGs related most to this issue is Goal 3: Good Health and Well-Being, and part of its targets includes general issues like maternal, neonatal, and infant mortality, infectious and noncommunicable diseases, substance abuse, environmental health, etc. Mainly, the goal also plans to target Health financing and workforce is another one of the targets, and it aims to increase recruitment, development, training, and workforce retention. To strengthen the worldwide capacity for early warning, risk reduction, and health risk management, there is also an emergency preparedness target. Finally, the most important target of all is Universal Health Coverage, which includes financial risk protection, access to essential services of good quality, affordable essential medicines, and vaccines for everyone worldwide. This last target supports other targets to be achieved as well.[161]

Another important SDG to consider is SDG 10: Reduced Inequalities. This goal ensures that no one is left behind while trying to achieve the other 16 goals. Contrary to normal beliefs, this goal is not only targeted towards gender inequalities but also different topics.[162] Specifically within health, this goal focuses on helping to develop a better health and welfare sector for society. Achieving this may include welfare projects covering underprivileged and equitable healthcare environments. [163]

Bloc Analysis

Points of Division

With pressing concerns like migration, varied working conditions, and unequal educational opportunities, the health workforce is on track for worldwide collapse. Made worse by COVID-19, HIV/AIDS, and other pandemics, the workers who carry the health of the globe on their shoulders are already feeling its drastic effects. Governments are well aware of this. In 2022, the WHO released a plan titled "The Working for Health 2022–2030 Action Plan."[164] This action plan detailed how countries can jointly support each other to optimize, build, and strengthen their health and care workforces. At the Seventy-fifth World Health Assembly, over one hundred countries co-sponsored the Action Plan and the related Global Health and Care Worker Compact.[165] However, the implementation of this plan by 2030 is no easy task. Points of contention still lie around planning and financing, education and employment, and protection and performance.[166] Furthermore, the Action Plan provides a one-size-fits-all approach to addressing the needs of the health and care workforce. In particular, the progression model of the plan, which outlines flows of support through the year 2030, is acutely focused on the Global South.

While those countries appreciate this, workers with similar circumstances in higher-economy countries will be neglected. As a result, each country's priorities and capacity to enact meaningful action can differ. To navigate this, three blocs have been outlined below. The indexes used are the same used for the Action Plan listed above. These are the Global Health Workforce Index provided by the WHO. This index measures the number of doctors, nurses, midwives, and community/traditional health workers per 10,000 people in each country. The second is the Universal Health Coverage (UHC) Index, also provided by the WHO, which details coverage of essential health services and catastrophic health

160 UN Development Programme. "What are the Sustainable Development Goals?"Accessed September 7, 2023. https://www.undp.org/sustainable-development-goals.
161 World Health Organization. "Targets of Sustainable Development Goal 3". World Health Organization Europe. Accessed September 7, 2023. https://www.who.int/europe/about-us/our-work/sustainable-development-goals/targets-of-sustainable-development-goal-3
162 United Nations. "Goal 10: reduced inequality within and among countries". *Sustainable Development Goals.* Accessed September 7, 2023. https://www.un.org/sustainabledevelopment/inequality/
163 United Nations. "Realizing SDGs Goal 10th through Health & Welfare Education for Developing Countries". Department of Economic and Social Affairs. Accessed September 7, 2023. https://sdgs.un.org/partnerships/realizing-sdgs-goal-10th-through-health-welfare-education-developing-countries
164 "Working for Health 2022-2030 Action Plan - World," ReliefWeb, February 4, 2023, https://reliefweb.int/report/world/working-health-2022-2030-action-plan
165 World Health Organization, *Working for Health 2022–2030 Action Plan Adopted by Seventy-Fifth World Health Assembly*, (World Health Organization: WHO, June 2, 2022), https://www.who.int/news/item/02-06-2022-w4h_wha75.
166 ReliefWeb, "Working for Health 2022-2030 Action Plan - World."

spending.[167] These indexes provide context into countries that are facing similar circumstances and may create collective and collaborative solutions to address the needs of the world's healthcare workforce. Finally, delegates need to understand some important factors in these indexes that create some outliers. Smaller populations would mean fewer doctors per 10,000, but that may not necessarily correlate to a large shortage. Moreover, due to greater UHC, fewer doctors are needed to support the population. Some notable outliers are Austria and The Philippines, which sit on two opposite ends of the spectrum. Delegates should research wisely when determining solutions and alliances.

Countries with Critical Shortages and Low Healthcare Coverage

This bloc includes countries officially listed on the WHO Health Workforce Safeguards and Support List 2023. They have a health workforce density of less than the average of 49 per 10,000 people and a UHC service coverage index of less than 55 out of 100. This bloc contains 55 countries, including Nigeria, Afghanistan, Somalia, Yemen, Haiti, and the Lao People's Democratic Republic (Laos). These countries require priority support for health workforce development and health system strengthening, along with additional safeguards that limit active international recruitment.

These countries engage with the issues in various ways. Due to their economic status, education coverage, or government management, they often need to be able to prioritize health workforce strengthening. Due to various international trade agreements, including scholarships and grants, many of their up-and-coming workers are also looking elsewhere to migrate. With low infrastructure and fewer opportunities, it creates an unfortunate cycle that must be ended. Their current economic and social development does not allow them to shift away easily from job loss or disaster preparedness, causing their current workers to face increased stress, anxiety, and depression. These countries may band together to collaborate on combating international migration and head-hunting of the health workforce, while also calling out for support from the WHO and other UN agencies to ensure their people do not go without the required health services they need.

Countries with Average Shortages and Medium Healthcare Coverage

Using the same parameters for measurement, this bloc includes countries just outside the WHO Safeguards and Support List. They have a health workforce density of 49 to 65 per 10,000 people and a UHC service coverage index of 55 to 65 out of 100. This bloc includes India, Namibia, Maldives, and Iraq. These countries maintain infrastructure, education, and finances to avoid critical health shortages and still provide medium access to UHC within their borders. However, without immediate action, they can quickly and easily fall below the worldwide average, especially those on the lower end. Some outliers included in this bloc are Fiji, Jamaica, and South Africa. These countries still need to be listed as a priority by the WHO, but regardless, they still need attention to ensure they can maintain and build on their standards. This would mean increased funding into areas of education and negotiating trade deals for information and workers, while still being cautious of international migration. The WHA did note that the negative health, economic, and social impact of COVID-19, coupled with the increasing demand for health and care workers in high-income countries, might be increasing vulnerabilities within these countries and cause them to move drastically across the two indexes. Thus, these countries must use various platforms and solutions to deliver crucial services to build up their healthcare workforce.

Countries with Minor Shortages and High Healthcare Coverage

Finally, this bloc includes countries on the upper end of the two indexes. They have a health workforce density of more than 65 per 10,000 people and a UHC service coverage index of more than 65 out of 100. This bloc includes Sweden, Finland, Cuba, and Monaco. However, this bloc has special exemptions. The healthcare shortage applies to every country, despite the number of UHCs. Thus, this bloc also makes room for countries like Canada, the United States, the United Kingdom, Norway, and Greece, still suffering broadly from shortages

167 World Health Organization, "Universal Health Coverage (UHC)," (World Health Organization: WHO, June 29, 2023), https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc).

but having the economic safety nets for further UHC and infrastructure. The WHO urges these countries to support the common responsibility of the global healthcare workforce by investing in infrastructure, academic scholarships and grants, and providing pathways for immigration and emigration. They may collaborate and drive funds towards education, access, improving working conditions, and maintaining efficient healthcare systems. These countries still face shortages, but they have the necessary resources and safety nets to keep their healthcare systems effective for the next few years if immediate action is not received.

Committee Mission

The World Health Assembly is the highest decision-making body of the WHO and all health-related policy. Delegations from all WHO Member States attend it and focus on a specific health agenda prepared by the Executive Board. The WHA sets the prerogative for the World Health Organization, the leading United Nations agency that connects nations, partners, and people to promote health, keep the world safe, and serve the vulnerable—so everyone, everywhere, can attain the highest level of health.[168] The Health Assembly is held annually in Geneva, Switzerland.

With the healthcare shortage drastically affecting the world, The Assembly must take immediate and comprehensive action. The world as we know it is severely understaffed, with fewer healthcare workers than ever before. In particular, renewed focus must be given to the Global South, which is disproportionately impacted. Moreover, a one-size-fits-all approach could be more effective when looking at the contexts of every country. Thus, the WHA has the authority to set the tone and agenda for all other relevant bodies regarding critical healthcare issues. Delegates must consider the committee's mandate and power while drafting resolutions.

Furthermore, the WHA does not have control over solving non-health issues. However, delegates must be conscious of the unified nature of these topics, including finance, labor, working conditions, education, and access. This means asking how the healthcare shortage impacts the world. Solutions should be built around pathways that reduce and restructure international migration and create better working conditions for the healthcare workforce. Examples include increasing education and training, maintaining infrastructure, sustainable development and shifting towards green energy, and strengthening universal healthcare coverage. In addition, delegates are encouraged to research and follow conventions set by related bodies and organizations. These include the International Labor Organization, the Centre for Disease Control and Prevention, and UNAIDS. The WHA's agenda directly influences these bodies. They offer relevant and sometimes more friendly discussions about specific ideas within this topic. Finally, the goal of this session is for members of the Assembly to address healthcare shortages and promote a healthier society. Delegates must develop practical solutions and negotiate the global and domestic responsibility of each country's contribution towards healthcare access. Without comprehensive solutions, healthcare shortages will persist, endangering the well-being of millions across the globe.

168 "About WHO," World Health Organization, 2023, https://www.who.int/about.

WHA

NHSMUN 2024

TOPIC B:

ADVANCEMENT OF ASSISTIVE HEALTH TECHNOLOGY IN DEVELOPING STATES

Photo Credit: Sgt. Canaan Radcliffe

Introduction

Although it often goes unnoticed, assistive technology (AT) enables people with different disabilities to live healthy, empowered, and independent lifestyles. The term "assistive technology" serves as an umbrella term for assistive devices, systems, and services.[1] Because it improves a person's functional capacity and enables their involvement in all parts of life, assistive technology is important for people with long-term or short-term practical challenges. Assistive products can be tangible items like wheelchairs, eyeglasses, hearing aids, prostheses, walking aids, or incontinence pads. They can also be digital, and take the form of software and apps that facilitate daily time management, communication with others, access to information, rehabilitation, education, and training.. They could also modify physical surroundings, through grab rails or transportable ramps. With the development of digital technology alongside these forms of assistance, the field of assistive technology is constantly developing and expanding. Many assistive devices have benefited from, adjusted to, and even inspired technological innovation such as robotics, voice-input techniques, eye-gaze technologies, and other advanced forms of technology that are not readily available in all areas of the world.[2]

With this in mind, it is no wonder that out of one billion people requiring at least one form of AT, over 90 percent of them do not have access to the assistive devices that they need.[3] Breaking this down, an estimated only 5–15 percent of 40 million amputees receive prosthetic limbs. Only five percent of the 70 million people receive wheelchairs, and only ten percent of the world's need for hearing aids is met globally.[4] In addition to this, there are disparities in access to AT and services between people who live in different countries. Available in different economic climates and those with different impairments, genders, ages, languages, and cultural backgrounds. Other important factors may influence one's ability to receive adequate care, mainly reasons that have nothing to do with the patient and everything to do with the economy and infrastructure of their country. For example, high costs, limited availability of exports from other countries, and lack of governance may weaken the connection between healthcare providers and patients, therefore causing a delay in giving AT to those who require it.

In addition to these obstacles, users give about 75 percent of AT up.[5] This also leads to other seemingly unrelated problems like environmental crises and financial burdens. Overall, by providing adequate healthcare that aligns with the United Nations Sustainable Development Goals (SDGs), delegates in this committee can improve the healthcare needs of people with disabilities.

History and Description of the Issue

United Nations Involvement in Assistive Technology

How a society treats its members with disabilities and the amount to which it successfully integrates them into daily life, education, and employment are important indicators of how developed that society is. According to the World Health Organization's (WHO) *Report on Disability*, around 720 million people sustain some form of a disability that detriments their everyday lifestyle.[6] Furthermore, estimates also display

1 World Health Organization, "Assistive Technology," May 15, 2023, https://www.who.int/news-room/fact-sheets/detail/assistive-technology.
2 Samiul Haque Sunny et al., "Eye-Gaze Control of a Wheelchair Mounted 6DOF Assistive Robot for Activities of Daily Living," *Journal of Neuroengineering and Rehabilitation*, (December 18, 2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8684692/.
3 Tangcharoensathien V et al., "Improving access to assistive technologies: challenges and solutions in low- and middle-income countries," *WHO South-East Asia J Public Health*, (2018), 84–89, https:// doi:10.4103/2224-3151.239419.
4 Brigitte Rohwerder, *Assistive technologies in developing countries* (Brighton, UK: K4D Helpdesk Report, 2018), https://assets.publishing.service.gov.uk/media/5af976ab40f0b622d4e9810f/Assistive_technologies_in_developing-countries.pdf.
5 World Health Organization, *Global report on assistive technology* (Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2022), https://www.who.int/publications/i/item/9789240049451.
6 World Health Organization, *World Report on Disability*, (Geneva: WHO Press, 2011), https://www.who.int/teams/noncommunicable-

a disproportionate number of disabled populations living in impoverished areas. According to experts in the public health field, "89 percent of people with vision impairment, 76 percent with hearing impairment, and 92 percent of those with a disability resulting from injury live in a low- or middle-income country."[7] In efforts to counter this, the World Health Organization (WHO) produced a priority assistive product list in 2016 and deemed the items on the list to be essential human rights to guarantee that everyone has access to assistive technology (AT).[8] WHO hoped that this would make AT more widely accessible. However, access to AT is challenging in underdeveloped nations, particularly in rural areas with severe institutional gaps. With this in mind, in 2022, the World Health Organization released its pioneering *Global Report on Assistive Technology*.[9] The main purpose of this report, according to UNICEF Executive Director Catherine M. Russell, is "ensuring that quality, affordable assistive products are available for everyone who needs them."

Regarding the lack of assistive technology, this conflict reached international levels of concern after the UN held the Convention on the Rights of Persons with Disabilities (UNCRPD). After the introduction of this convention in 2008, the discussion around the lack of access to AT soared into popularity as it finally had a platform. However, as with any debatable topic, some complications come with implementing the policy. According to public health experts, "The nature of the debate has centered on whether it is more effective to provide targeted services to disabled people, or whether it is better to ensure that disabled people are mainstreamed in generic development initiatives." This questions whether it is better to give specific services only to people with disabilities, or to try to include everyone in every service provided. They also go on to explain that making this a 'human rights issue' will not ensure that those who require this technology will receive it since it is a broader approach.[10] Nevertheless, not all CRPD papers expressly mention AT measures. Despite this restriction, it can be deduced from the principles of Article 3 on gender equality and Article 5 on the abolition of discrimination based on disability, that States are required to make sure that everyone, regardless of disability, gender, or age, has access to affordable assistive products.[11] Additionally, focusing on this as a human rights issue may lead to indifference from governments of countries that are already experiencing pressure from other rights disputes. For example, Uganda passed the Persons with Disabilities Act in 2006, yet there have been no signs of improvement in terms of AT sufficiently being provided to fit the country's needs. There are many factors this can be attributed to, including the economic status of the country, as well as cultural and societal implications that can contribute to healthcare volatility.[12]

The Convention's Articles 4 and 26 clearly state that it is ultimately the responsibility of governments to make sure that appropriate assistive technology is both accessible and inexpensive, and that users are provided with the necessary training to utilize such goods. Recently, the South African National Departments of Health and Social Development used the CRPD to develop a white paper on disability and rehabilitation framework plans. Both texts emphasize the necessity of accessible and inexpensive assistive technology for people with impairments. However, other South African studies indicate that in addition to societal attitudes toward people with disabilities and a rights-based approach, government officials and service providers also play a significant role in the failure to implement the UNCRPD's health and rehabilitation articles.[13] Certainly, this includes the majority of users of AT. Fundamentally speaking, improving

diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability.
7 Emma Smith, "The Global Report on Assistive Technology: a new era in assistive technology," *Assistive Technology*, 34:3, June 2022, 255-255, https://doi.org/10.1080/10400435.2022.2077596.
8 World Health Association, *Priority Assistive Products List* (World Health Organization: the GATE Initiative, 2016), https://www.who.int/publications/i/item/priority-assistive-products-list.
9 World Health Organization, *Global report on assistive technology*.
10 Raymond Lang et al., "Implementing the United Nations Convention on the Rights of Persons with Disabilities: Implications, Practice and Limitations," *Alter* 5, no. 3, 2011, 206-220, https://doi.org/10.1016/j.alter.2011.02.004.
11 UN Human Rights Council, General Comment No. 6, Equality and nondiscrimination, CRPD/C/GC/6, ¶ 1 (April 26, 2018), https://www.ohchr.org/en/documents/general-comments-and-recommendations/general-comment-no6-equality-and-non-discrimination.
12 Julie Abimanyi-Ochom and Hasheem Mannan, "Uganda's Disability Journey: Progress and Challenges," *African journal of disability*, (November 25, 2014), https://doi.org/10.4102/ajod.v3i1.108.
13 Malcolm MacLachlan, "Assistive Technology Policy: A Position Paper from the First Global Research, Innovation, and Education on Assistive Technology (GREAT) Summi, "*Journal of Rehabilitation Medicine* 13, no. 5, 2018, https://doi.org/10.1080/17483107.2018.1468496.

access at the systems and policy level requires not only better 'systems,' but also altered organizational, societal, religious, and cultural attitudes. However, it is possible that using assistive technology can alter attitudes for the better. In Bangladesh, experts discovered that those who used assistive goods were about three times more likely to report favorable sentiments from neighbors than those who did not.[14]

As agreed in the Sustainable Development Agenda, member states are committed to completing and achieving the Sustainable Development Goals by 2030. According to SDG 3: *Good Health and Well-Being,* member states are obligated to comply with any efforts to increase access to assistive technology. They cannot reach this goal without including AT as a crucial element of integrated, people-centered health services and universal health coverage. To meet the objectives of other SDGs, including access to public services like education (SDG 4: Inclusive education) and employment (SDG 8: Decent work for all), AT is also required as they aid in completing everyday tasks included in these goals. In 2016, the WHO Regional Committee for the Eastern Mediterranean adopted resolution EM/RC63/R.31 on improving access to assistive technology at its 63rd session.[15] Additionally, the World Health Assembly's resolution WHA 71.82 on the same topic reiterated this in 2018. Under Resolution WHA 71.8, WHO was tasked with creating a global report on effective access to AT (GREAT) within the framework of an integrated strategy, based on the best available scientific data and worldwide experience.[16]

To increase access to high-quality, reasonably priced assistive goods globally, WHO launched the Global Cooperation on Assistive Technology (GATE) program in 2014. This effort was created in collaboration with international organizations, donor agencies, professional organizations, academia, and user groups affiliated with the UN, which globalized this initiative and expanded its outreach. GATE introduced the Priority Assistive Goods list in 2016. Items that are "highly needed, an absolute necessity to maintain or improve an individual's functioning and which need to be available at a price the community/state can afford" are referred to as "priority products."[17] To help states create national AT policies and programs as an essential part of universal health coverage, there are still other efforts being conducted. This includes a policy framework, a training program, and a model for how goods and services are delivered. Not only will this increase technological accessibility, but it will also serve as an example for lower-developed countries to develop their combative techniques.

The World Health Organization and the UN Children's Fund (UNICEF) made "The Global Report on Assistive Technology" to present evidence of the global need for and access to technology that can make a fundamental difference in their lives. According to WHO Director-General Tedros Adhanom Ghebreyesus, "Assistive technology is a life changer, it opens the door to education for children with impairments, employment and social interaction for adults living with disabilities, and an independent life of dignity for older persons". This report shows that more than 2.5 billion people require one or more assistive products, especially those that address communication and cognition like wheelchairs or hearing aids, there are at least 1 billion people that have no access to them. In addition, there is a huge gap between low and high-income countries, with at least 35 States revealing that entry varies from 3 percent in low income countries and 90 percent in wealthier countries. According to UNICEF, there are almost 240 million children with disabilities around the world. UNICEF's Executive Director Catherine Russell says that denying children the right to the products they need in order to thrive, not only harms them individually, but deprives their families and communities of everything they could contribute if their needs were addressed.[18]

14 Johan Borg et al., "Assistive Technology Use Is Associated with Reduced Capability Poverty: A Cross-Sectional Study in Bangladesh," *Disability and Rehabilitation: Assistive Technology* 7, no.2, March 2012,: 112-121, https://doi.org/10.3109/17483107.2011.602173.
15 WHO, Resolution EM/RC63/9-E, Report of the 63rd session of the WHO Regional Committee for the Eastern Mediterranean, Dec 2016, https://applications.emro.who.int/docs/RC_final_Rep_2016_19339_EN.pdf?ua=1
16 WHO Regional Office for the Eastern Mediterranean, *Summary report on the regional consultation on the WHO-UNICEF global report on assistive technology (GREAT),* (Cairo: World Health Organization 2022), License: CC BY-NC-SA 3.0 IGO, https://apps.who.int/iris/bitstream/handle/10665/361349/WHOEMHLP131E-eng.pdf?sequence=1
17 World Health Organization, *Global report on assistive technology.*
18 United Nations. "Assistive technology: a 'life changer' for those most in need". UN News. May 16, 2022. https://news.un.org/en/story/2022/05/1118212

Assistive aid is provided after the 2017 Kermanshah Earthquake by locals

Credit: Mohammad Rafie

The major barrier to access to assistive technology is affordability. Almost two-thirds of people who use this type of technology reported paying "out-of-pocket" while the rest have to rely financially on family and/or friends. By 2050, the number of people in need of assistive technology is expected to rise to 3.5 billion, since there are aging populations and more cases of noncommunicable diseases. A survey was conducted in 70 countries, and it showed that there are gaps in the services and levels of workforce training, especially in the areas of cognition, communication, and self-care. In general, as shown by other WHO reports, key barriers are also the lack of awareness and services, poor product quality and supply chain challenges.[19]

The United Nations Development Programme (UNDP) in Egypt created the Open Innovation Challenge for People with Disabilities alongside Nile University and other institutions. This was created through submissions of prototypes of assistive technologies in the categories of: Access to Public Places and Transportation, Inclusive Education, Inclusive Employment and Health and Early Medical Intervention. The program plans to provide training to support and empower women and entrepreneurs with disabilities, while ensuring equal opportunities for everyone. These efforts were made in December 2020 in Giza, as a part of "Egypt's Walk for Inclusion for Persons with Disabilities."[20]

In 2021, WHO, the European Civil Protection and Humanitarian Aid Operations, alongside Canada's government created a project to improve access to inclusive healthcare for older people and people with disabilities in the Islamic Republic of Iran. The project aimed to support new activities to increase the COVID-19 response and the capacity of long-term care facilities, while procuring AT for vulnerable populations and training caregivers to give tailor-made services to older people and people with disabilities through online platforms for research. Thanks to this project, more than 7000 older people and people with disabilities in long-term care facilities were granted access to improved and better COVID-19 protection and response. At least 30 long-term care facilities with more than 140 habitants in 14 provinces were given the priority to receive needed equipment and training to create a standard isolated room to reduce the pandemic risks. Moreover, at least 900 people with severe disabilities in urgent need of AT were provided with wheelchairs.[21]

19 United Nations. "Assistive technology: a 'life changer' for those most in need".
20 UNDP. "UNDP launches Assistive Technology Incubation Programme to support PWDs in Egypt". United Nations Development Programme. April 26, 2021. https://www.undp.org/arab-states/press-releases/undp-launches-assistive-technology-incubation-programme-support-pwds-egypt
21 World Health Organization. "WHO in Islamic Republic of Iran". Eastern Mediterranean Region. August 21, 2022. https://www.emro.

In the case of children, when those with disabilities are given opportunities to grow as any other, they can potentially lead fulfilling lives and contribute to their communities in a social, cultural and economical way. However, having to thrive and survive is very difficult for children with disabilities. Mostly because they are isolated, excluded, cut off from health, education and social services, and have limited opportunities to be a part of their family or community life. This takes a direct toll on their future employment opportunities and civic life involvement. In UNICEF's words, for most children, "assistive technology represents the difference between enjoying their rights or being deprived of them". The urgency to tackle this issue comes from the fact that in low income countries, only 5–15 percent of those in need of At are able to get it. Globally, there are more than 150 million children under the age of 18 with disabilities. Children with disabilities face more challenges, since girls are at risk of both discrimination and abuse. Both boys and girls have lower rates of primary school completion than those without disabilities, since in most cases, their lack of access to AT is a contributing factor.[22]

Socioeconomic Consequences of Poor Healthcare Allocation

As seen in countless cases, countries face detriments to their communities because of little access to assistive technology (AT). The problem is simple: people are not getting the devices they need to live equitably to their peers who do not face the same difficulties. There are a plethora of reasons as to why assistive healthcare is not easily provided in certain areas of the world, especially reasons that are not related to healthcare at all. However, solutions must be implemented in time to prevent these problems from worsening, and ultimately leading to the demise of a healthy society.[23]

According to the WHO Journal of Southeast Asia, approximately 70 million people in the world need a wheelchair, but only about 15 percent of this population can receive one.[24] Additionally, when it comes to visual aids, over 200 million people require some form of seeing eyeglasses or other low-vision devices but do not have access to the technology or assistance needed. There is also a disproportionate level of need compared to the level of demand. In other words, the demand for assistive devices does not match the number of people who need these devices to function properly. WHO's journal also goes into this issue, using falling as an example. "Falls are an important external cause of unintentional injury and disability that increase in frequency with age and frailty, yet they remain a neglected public health problem in low middle-income countries."[25] In other words, members of lower developed countries have also experienced feelings of learned helplessness, where the difficulties of obtaining healthcare outweigh the difficulties of learning to live around their handicap. This learned helplessness ultimately carries into the apathetic attitude societies may encounter when advocating for other serious issues, specifically regarding their socioeconomic status. If a person does not think they can realistically receive the care they need to live, why would they attempt to resolve any issues that affect others?

In 2017, a study was conducted using data from the 2015-16 Malawi Demographic and Health Survey. When looking at a smaller set of data from children suffering from an impairment in walking, seeing, or standing, the results showed a positive correlation between children suffering from physical handicaps and where they lived. Children living in rural areas were more likely to use assistive devices, while children in urban areas were less likely to own any.[26] In other studies conducted similarly, experts noted that residents of more populous areas may have negative opinions towards AT usage. Gender may also contribute to the lack of technological access, especially in patriarchal countries. Women who experience gender-based discrimination may also have greater financial volatility and,

who.int/iran/news/who-eu-and-canada-project-to-improve-access-to-inclusive-health-care-for-older-persons-and-people-living-with-disabilities-gets-one-step-closer-to-results.html
22 Rosangela Berman Bieler and Kees de Joncheere. "Assistive Technology for Children with Disabilities: Creating Opportunities for Education, Inclusion and Participation". UNICEF, WHO. 2015. https://www.unicef.org/media/126246/file/Assistive-Tech-Web.pdf
23 Tangcharoensathien et al., "Improving access to assistive technologies: challenges and solutions in low- and middle-income countries."
24 Tangcharoensathien et al., "Improving access to assistive technologies: challenges and solutions in low- and middle-income countries."
25 Tangcharoensathien et al., "Improving access to assistive technologies: challenges and solutions in low- and middle-income countries."
26 Monica Jamali-Phiri et al., "Socio-Demographic Factors Influencing the Use of Assistive Technology among Children with Disabilities in Malawi," *International Journal of Environmental Research and Public Health 18*, no. 6 (2021). Accessed July 4, 2023, https://doi.org/10.3390/ijerph18063062.

therefore, are not able to afford adequate health assistance. Additionally, living in an urban area often means that one lives closer to a healthcare facility, so the need for an assistive device may not be as high as someone with less access to healthcare. This study excellently portrays how a seemingly unrelated factor to healthcare, like where someone lives, may directly affect how health maintenance is distributed.

Lower-and middle-income countries are highlighted in this topic because they require special resources to provide the high quantity of assistive devices needed in their country. One of the largest socioeconomic factors in providing assistive technology is the lack of financing and economic stability to support the flow of AT through their community. More specifically, countries classified as lower-income have a limited range of outreach and production of products to match demand. In their report on assistive technology, WHO explains that healthcare products are typically imported into these countries rather than domestically produced.[27] "Although importing assistive products is a feasible and cost-effective option, inadequate buying power can be the most significant barrier to increasing national supply." "Buying power" is essentially the amount of money one has to purchase securities. Cost is the main economic component that is connected to the user's buying power. The higher the cost of AT, the lower the buying power that people with disabilities have. Buying power is an important factor to consider when looking at how various countries are affected by disparities in healthcare. Is the price paid for assistive devices similar to the value or benefit that persons with disabilities receive? Will the elderly purchase AT if the price is too high for them? Cost is the primary factor in determining whether elderly or disabled individuals choose to use AT, therefore indirectly affecting the overall usage and accessibility of AT. For most parts of the world at the moment, neither public nor private insurance programs will fully cover the expense of using assistive technology. The majority of the disabled population lacks sufficient means to purchase because they have reached retirement age. Because of its advantages, having AT is much more crucial for those people. The report also goes on to explain that the lack of knowledge and information on AT may also cause its low demand, as someone who does not know of the resource cannot possibly take full advantage.[28]

Finally, it is hard to implement technological remedies in an area that is not suitable for technology. For example, if someone benefits from video conferencing with their doctors because they are deaf and have no transportation, they still may not be able to utilize this feature if they have no internet connection. Evidence also demonstrates that the perceived utility of assistive devices by users boosts utilization and results. For popular items like glasses and certain demographics like young adults, aesthetic preferences are especially crucial, which can also go back to the fact that some may not feel comfortable using AT, due to cultural and societal factors. Even though design has a significant role in the willingness to use assistive goods, many of them are neither gender- nor age-friendly. To remedy this, it may be necessary to reduce stigma and promote the utilization of this technology, which will in turn increase demand and create a substantial healthcare flow throughout the country. Overall, it is important to consider all parameters of the causes and effects of the lack of accessibility to AT, even when they are seemingly unrelated.

The WHO found that "there is a general lack of state funding, nationwide service delivery systems, user-centered research and development, procurement systems, quality and safety standards, and context-appropriate product design."[29] In other words, access to assistive technology is not currently possible since assistive healthcare is costly in many parts of the world across lower, middle, and high-income countries. Hearing aids in Northern Nigeria cost almost an entire month's salary, and a survey conducted in Bangladesh indicated that two-thirds of the population who require a wheelchair do not use one because they are too costly.[30] The severe economic and health crisis caused by the ongoing COVID-19 pandemic shows that unless global health systems are governed by the common good, many people will remain excluded from their benefits.

27 World Health Organization, *Global Report on Assistive Technology*.
28 Lucas Downey. "Buying Power (Excess Equity): Definition in Trading and Example," *Investopedia*, August 23, 2021. https://www.investopedia.com/terms/b/buyingpower.asp
29 "Assistive Technology," World Health Organization, Newsroom, Accessed July 30, 2023, https://www.who.int/news-room/fact-sheets/detail/assistive-technology.
30 Brigitte Rohwerder, *Assistive Technologies in Developing Countries.*

This increases existing inequalities in income insecurity and under-funded health systems after decades of severity policies, closely aimed at minimizing costs and fixing failures of the market.[31]

However, the COVID-19 pandemic revealed that there is no trade-off between economic growth and investing in health systems. Instead, health and the economy are found to be interdependent. Health is both a key economic sector, but also an issue underlying the basic performance of labor that is essential for the economy. If people with disabilities cannot adequately take care of themselves independently, then they are not able to take care of their community. Many factors cause the unmet need for assistive technology, including a lack of knowledge of the need, stigma, and prejudice, a poor enabling environment, a lack of political prioritization, inadequate investment, and market hurdles on the demand and supply sides. Due to the aging global population, the rising prevalence of non-communicable diseases, and other causes, this need is anticipated to double by 2050.[32]

Unfortunately, to provide health for everyone and its significant economic benefits, neither commercial enterprises nor charitable efforts given by non-profit groups are sufficient. However, giving people the money to buy assistive devices could make economic sense given the potential for assistive technology to improve quality of life, independence, and economic productivity. About half of all assistive devices in the US are partially funded by outside organizations, like grants from the government or nonprofits. While grants and government money do help some buy assistive equipment, this funding is limited due to the numerous demands and other priorities in a system that is already under stress. The availability of funds for people with disabilities is further constrained by the high cost of assistive technology and the unavailability of solutions for the financially unstable. The idea of employing industrial and innovation policy to address the lack of assistive technology is being embraced by policymakers more and more in the context of utilizing unorthodox solutions.[33]

In addition, unlike mass-marketed retail products, assistive technology is complex and needs to be supported through a range of extra and extended services to ensure that devices

31 Thuraya Khalil, "Global Survey on Government Action on the Implementation of the Standard Rules on the Equalization of Opportunities for Persons with Disabilities" (Office of the UN Special Rapporteur on Disabilities, October 2006), https://www.un.org/disabilities/documents/srreports/gsr30jan07.doc.
32 Clive Gilbert, "The challenge of making assistive technology affordable is becoming more urgent" *LinkedIn*, 2023, https://www.linkedin.com/pulse/challenge-making-assistive-technology-affordable-becoming-gilbert/.
33 William Li and Clara Sellers, "Improving Assistive Technology Economics for People with Disabilities: Harnessing the Voluntary and Education Sectors," *Journal of Rehabilitation Medicine*, 2009, https://doi.org/http://dx.doi.org/10.1109/TIC-STH.2009.5444391

Participant observes the 39th National Disability Prevention and Rehabilitation Week Celebration in the Philippines

Credit: Judgefloro

meet individual requirements. These extra surcharges are often hidden in the off-the-shelf price and can drastically increase a user's bill. To support assistive technology in use by an individual, healthcare providers work closely with health services and other professionals to ensure that they arrive at the best solution for the individual. These labor hours can also increase the cost of assistive technology and further the divide between those who can and can't afford them.

A method to remedy this is market shaping.[34] Market shaping tries to decrease long-term supply and demand imbalances, decrease transaction costs, and boost market knowledge by involving all stakeholders. A market-shaping role for policy would allow for a change in the pace and direction of economic growth, moving away from private profit-driven growth and toward larger concepts of public value creation. Some domains, including global health, have effectively used market shaping, demonstrating its potential for assistive technology. However, traditional methods of evaluating policies using cost-benefit analysis struggle to understand the changing and powerful impacts of industrial policies that shape healthcare markets, especially in developing economies. Market shaping has addressed market barriers on a large scale, whether it be by lowering the price of antiretroviral drugs for HIV by 99 percent in 10 years, increasing the number of people receiving malaria treatment from 11 million in 2005 to 331 million in 2011, or tripling the number of women receiving contraceptive implants in four years while saving donors and governments USD 240 million.[35]

Enhancing market efficiency, increasing information openness, and coordinating and motivating the multiple stakeholders involved in both demand- and supply-side operations are all achieved through market-shaping actions. Collective buying, reducing the risk of demand, creating demand predictions and market intelligence reports, standardizing rules across markets, establishing differential pricing agreements, and improving service delivery and supply chains are a few examples of market-shaping initiatives. Even though affordable and accessible assistive technology is important, there does not seem to be much attention paid to it in the literature currently in circulation, including in terms of market shaping. Although few publications distinguished between the experiences of men and women concerning assistive technology, the available research appeared to be mostly gender-blind. This is important to consider since some countries may have disproportionate populations of men and women with disabilities and do not have access to assistive technology. If this is the case, some initiative towards gender-based empowerment may be necessary, as any imbalance in socioeconomic status may alter the success rate of increasing access to assistive technology.[36]

However, the realization of assistive technology's transformative potential is complicated by the persistent and daunting cost barrier. The high expense associated with many assistive technology devices, such as hearing aids or advanced mobility equipment, remains a significant financial hurdle for individuals with disabilities and their families. Furthermore, the global disparities in assistive technology access are striking, with developed nations often having more comprehensive infrastructure and funding options, while lower-income countries struggle to provide even basic assistive devices. This lack of accessibility perpetuates existing inequalities in healthcare and social participation, emphasizing the urgency of addressing the issue.[37]

To overcome these challenges, a multi-faceted approach is essential. Governments must play a pivotal role by implementing affordability initiatives, such as subsidies, grants, or reimbursement programs, and by ensuring that assistive technology is a part of universal healthcare coverage. Public-private partnerships can drive down assistive technology costs through economies of scale and innovative financing models, while continued investment in research and development can lead to more cost-effective solutions without compromising quality. Raising awareness about the importance of assistive

34 Clive Gilbert, "The challenge of making assistive technology affordable is becoming more urgent."
35 Margaret Savage et al. "Digital Assistive Technology. A Market Landscape and Strategic Approach to Increasing Access to Digital Assistive Technology in Low- and Middle-income Countries." *Product Narrative*, 2020, https://www.at2030.org/product-narrative:-digital-assistive-technology/
36 Margaret Savage et al. "Digital Assistive Technology. A Market Landscape and Strategic Approach to Increasing Access to Digital Assistive Technology in Low- and Middle-income Countries."
37 Margaret Savage et al. "Digital Assistive Technology. A Market Landscape and Strategic Approach to Increasing Access to Digital Assistive Technology in Low- and Middle-income Countries."

technology and advocating for policy changes can drive the prioritization of affordable assistive technology solutions at both national and international levels.[38]

Finally, we need to look at the positive impact of implementing assistive technology. The impact of assistive technology extends even further, fundamentally altering the social fabric of communities. By promoting social inclusion, assistive technology technologies break down the barriers that have long separated individuals with disabilities from their peers. Access to education, employment, and community activities becomes a reality rather than a distant dream, reducing isolation and fostering a profound sense of belonging. Assistive technology also brings forth health benefits, enabling individuals to better manage their health conditions.[39] Devices like insulin pumps or medication management systems simplify the complex task of disease management, potentially reducing the risk of complications and improving overall health outcomes.

In conclusion, delegates are tasked with finding the balance between affordable assistive technology and the impact that it can have on the individuals who rely on it. This task is not easy, but can change the world for the better and give everyone equal opportunities everywhere.

Difficulties Faced in Lower- and Middle-Income Countries

Because lower and middle-income countries typically have fewer financial resources, there are consequently several effects on assistive technology as well. Notably, poor device quality is one of the most ignored causes of the lack of assistive technology in rural areas, ultimately leading to many devices being abandoned despite their usefulness. In São Paulo, Brazil, a survey was conducted on the percentage of the handicapped population who successfully received assistive technology but later abandoned it. The study concluded that 19.38 percent of assistive devices were abandoned.[40] With almost a fifth of the handicapped population abandoning the devices that help their quality of life, delegates should consider resource allocation and how to ensure that assistive technology is effectively created.

Ensuring that assistive technology does not end up abandoned is one of the greatest challenges, especially in lower and middle-income countries. In a review of surveys and studies from countries around the world, Howard and others found six primary reasons why assistive technology was abandoned. These include design and function, including lack of options for customizing it, high purchase and maintenance costs, and not being easy to use; information and awareness including a lack of training or instructions and health professionals not knowing enough about the technology available; service provision, including user frustration into being forced into certain products or a convoluted administrative paperwork process; societal barriers, such as stigma; and infrastructure, including paths that lacked ramp access, shops with narrow aisles, and poor public transportation design. Collectively, the study showed that globally, users were concerned that they are not represented at the policy level and that government recognition of assistive technologies is lacking.[41]

Proper healthcare services begin with the relationships between patients and healthcare workers, and this starts with infrastructural improvement in other sectors, such as the government and economic stability in the community. Additionally, effective sourcing and procurement of assistive technology is vital to their success in a country. Recognizing this challenge, the WHO has published a manual that seeks to improve "countries' capacity for procurement of priority assistive products."[42] With this, countries will be able to better address concerns with assistive technology such as pricing, contracts with buyers and suppliers, and product quality. When observing assistive technology systems, poorly designed, funded, and managed procurement and delivery processes

38 Margaret Savage et al. "Digital Assistive Technology. A Market Landscape and Strategic Approach to Increasing Access to Digital Assistive Technology in Low- and Middle-income Countries."
39 World Health Organization, "Assistive Technology," May 15, 2023, https://www.who.int/news-room/fact-sheets/detail/assistive-technology.
40 André T. Sugawara et al., "Abandonment of assistive products: assessing abandonment levels and factors that impact on it," *Disability and Rehabilitation: Assistive Technology*, 13:7, 716-723, 10.1080/17483107.2018.1425748
41 Jonathan, Howard, et al. "Exploring the barriers to using assistive technology for individuals with chronic conditions: a meta-synthesis review". *Disability and Rehabilitation: Assistive Technology.* 14 no.4. July 14, 2020: 390-408. https://doi.org/10.1080/17483107.2020.1788181
42 "A manual for public procurement of assistive products, accessories, spare parts and related services". *World Health Organization and the United Nations Children's Fund*, 2020. https://iris.who.int/bitstream/handle/10665/341892/9789240013988-eng.pdf?sequence=1

can go unnoticed, ultimately delaying and decreasing access.[43]

The World Health Organization recognized the need for more high-quality disability data and created the Brief Model Disability Survey (MDS). The survey was conducted through face-to-face household interviews in Tajikistan, Laos, and India in 2018, and included a module on the usage and need for assistive technology. The findings show that as a person's level of handicap rises, so does their requirement for assistive technology. About 30 percent of those with severe disabilities report living in Tajikistan and the Lao People's Democratic Republic without assistive technology, despite needing it. India's equivalent percentage is 18 percent.[44]

The absence of proper training and education for healthcare workers also negatively affects the allocation of assistive services. The WHO found that several countries lacked training and education. Specifically, "15 countries (21 percent) had training and education that covered service provision, repair, and maintenance for all functional domains, while 30 countries (43 percent) had training and education opportunities only for some functional domains." To add to this, only seven countries reported having adequate and trained professionals to assist patients. This jarring statistic shows the severity of this issue, as almost half of the represented countries did not have the proper training needed to provide for their disabled populations and 10 percent of countries felt comfortable in their policies regarding healthcare training. Education is known as the root source for most topics, and access to assistive technology is no different. By providing relevant education, assistive technology will have a more effective and lasting impact. Furthermore, people with disabilities often make less money as a result of the obstacles to education and employment they confront. This can be through inaccessible workspaces, non-inclusive work environments, and inadequate training accommodations. Frequently, family members also lose out on opportunities because they must forgo their education or employment to give the necessary help. Because of the higher costs needed to maintain comparable levels of living, households with children with disabilities or individuals with a substantial handicap earn significantly less than those without disabilities. This explains why they are overrepresented among the poorer sector of the population.[45]

With the focus on developing countries, the lack of governmental attention greatly contributes to the inability to provide sufficient technology. In some countries, social protection systems often make access possible, whether it be through health insurance, inclusion in Universal Health Coverage (UHC) plans, subsidies, cash transfers, or direct distribution. However, the more general problems with access to assistive technology, like lack of knowledge, availability, and basic human resources, exacerbate obstacles to social protection. On top of this, only 33.5 percent of people with major disabilities worldwide receive disability benefits, and this number drops to fewer than 10 percent in low-income states, where many of these people are likely to require assistive technology. This is another example of why socioeconomic factors must be addressed when increasing access to assistive technology, as countries that do not have a sustainable welfare system will not succeed in aiding their lower-income populations.[46]

Disability and poverty are frequently linked in developing nations because of the restricted engagement of people with disabilities in jobs, education, and communal activities. Employment and education help people get out of poverty, improve their health, and become more active in society. Studies in high-income nations have found that assistive technology can improve access to school and raise achievement, which can have a beneficial socioeconomic impact on the lives of individuals with disabilities. Using assistive technology to support participation in the workforce and health maintenance is an effective technique. Despite these promising results,

43 Alexandre Cote, "Social Protection and Access to Assistive Technology in Low- and Middle-income Countries," *The Official Journal of RESNA 33*, no. 1, 2021, https://doi.org/10.1080/10400435.2021.1994052
44 Faheem Hussain and Suzana Brown, "The Role of ICTs for Evaluating Access and Mobility of Refugees Using Assistive Devices: Case Study of Rohingya Camps in Cox's Bazar," *Association for Information Systems*, 2022, https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1008&context=globdev2022
45 Balram Bhargava et al., *Global Report on Assistive Technology* (World Health Organization and the United Nations Children's Fund (UNICEF), n.d.).
46 "World Social Protection Report 2020-22" (Geneva, Switzerland: International Labour Organization), accessed August 22, 2023, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---soc_sec/documents/publication/wcms_817574.pdf.

underdeveloped nations have relatively limited access to assistive technologies.[47]

The availability of assistive technology is limited since it serves the requirements of high-income settings in general. In low-income countries the needs of all those who require assistive devices are generally not met due to availability, accessibility and in many cases, a short supply of them. Affordability plays an important role, since not only getting the device is important, but costs of maintenance and other indirect costs should also be taken into consideration.[48]

Depending on the country's culture, beliefs and economic systems, assistive products are supplied by the government, non-governmental organizations, faith based organizations, private sector and disabled people's organizations. Research in countries like South Africa, Malawi, Namibia and Sudan shows that the most common sources of AT were government health services, but a high percentage (almost 30 percent) was provided by international humanitarian aid, development, charities and religious organizations. Private health services provide around 23 percent of the products, and these were more common as a source in urban areas and among women. On the other hand, Bangladesh's data shows that government facilities are responsible for providing 1 percent of AT, and about two-third of hearing aid users and three-quarters of wheelchair users had their technology provided by NGO sources. One in five wheelchair user respondents got their technology specifically from community members, clubs and volunteer organizations. Both hearing aid and wheelchair users got their products free of charge thanks to the help of these previous examples.[49]

Assistive technology providers may shift due to the development of technology and manufacture. In previous years, to get glasses, was based on collecting used and donated glasses for distribution through volunteer work within communities. However, there has been a significant decrease in the cost of glasses in general, and this has allowed NGOs and inclusive businesses to create new models to sell and deliver low-cost, attractive and new glasses within optical shops and vision centers. This is the perfect example of a cost-effective model than distributing recycled glasses.[50]

A report by the World Bank shows that when people living with a disability cannot participate in work and their communities, this costs up to 7 percent of the countries' economy through the GDP annually. This key takeaway was observed in Indonesian data. In Indonesia, people with disabilities, women and elderly have more representation, and they show consistent results of having less education, worse health conditions, less access to public services and economic opportunities compared to people who do not have a disability at all. In addition, Indonesia ranked 155th place on a 2020 index of inclusiveness within countries, behind neighbor countries like Thailand and Singapore.[51]

INKLUSI is a partnership between Australia and Indonesia that has the target of building an inclusive society. Suharto, the Executive Director of SIGAB (one of INKLUSI's partner organizations that focuses on equality for people with disabilities) claims that assistive devices covered by National Health Insurance are only 7 out of the 50 types of sources recommended by the WHO. Financial coverage is minimal, since there is still a big portion that is out of pocket for users. Talking about Indonesia specifically, their prices for AT like glasses, hearing aids and wheelchairs are way higher than in other countries and are normally only affordable for the richest 20 percent of households.[52]

Ensuring access to affordable assistive technology in these countries is also a matter of social justice and human rights. People with disabilities deserve equal chances, and giving them the necessary tools to participate in their society is fundamental. When increasing the availability and reducing the costs of these types of technologies, the gap will be

47 "World Social Protection Report 2020-22"
48 Rohwerder, Brigitte. "Assistive technologies in developing countries". Institute of Development Studies. [PDF]. March 1, 2018. https://assets.publishing.service.gov.uk/media/5af976ab40f0b622d4e9810f/Assistive_technologies_in_developing-countries.pdf
49 Rohwerder, Brigitte. "Assistive technologies in developing countries".
50 Smith, Elizabeth, et al. "Eyeglasses for Global Development: Bridging the Visual Divide". *World Economic Forum*. June 2016. https://www3.weforum.org/docs/WEF_2016_EYElliance.pdf
51 IA-CEPA ECP. "Limited access to assistive technology costs the economy up to 7% annually". - Press Release. *KATALIS*. September 26, 2023. https://iacepa-katalis.org/limited-access-to-assistive-technology-costs-the-economy-up-to-7-annually/
52 IA-CEPA ECP. "Limited access to assistive technology costs the economy up to 7% annually". - Press Release.

Elderly man is looking out and using a hearing aid
Credit: JD Mason

shortened, and it will empower individuals to lead more independent and satisfying lives. In addition, by addressing the issue, we can help create an economic investment since people with disabilities make up for a substantial portion of the global population, and their inclusion within the workforce can contribute to a country's economic growth, especially in low and middle income ones. Once individuals can access and afford AT, they will have an opportunity to be employed and reduce their reliance on social and economic welfare progress. It is essential to recognize that challenges related to availability and costs of AT are not limited to one country or region, since it has global implications. If the issue is addressed in low and middle income countries, innovation can be fostered and costs can be driven down, therefore, getting more accessible technologies worldwide. Finally, this can lead to a more inclusive global society that respects and cares for the rights and dignity of all its members.[53]

Combating Poor Assistive Technology

"Assistive technology for persons with disabilities is not an option; it is a necessity and a right mandated by several U.S. federal laws." In 1879, the US Board of Education collaborated with the Office of Special Education and Rehabilitative Services to create the first official legislation regarding assistive technology the country had ever seen. According to experts, "The Act to Promote the Education of the Blind provided funding to the American Printing House (APH) for the Blind for decorated books and equipment for blind students throughout the country, and APH continues this tradition today by producing hundreds of textbooks in a variety of media." To further explain, the United States pioneered assistive technology legislation during the 19th century, and as a result, the country has made space for students with visual impairments. Other examples of past U.S. legislation include The Tech Act of 1988, The Assistance Technology Act of 1998, and the Americans with Disabilities Act of 1990.[54]

Although the United States is only an example, its legislative action is a model in the fight for adequate assistive technology. The United Nations has made significant efforts to encourage member states to implement proper legislation in their governments. According to the UN's *Global Report on Assistive Technology,* "Political will, legislation, and adequate funding, along with permanent implementation systems and structures, are required to guarantee universal, rights-based assistive technology access for everyone, everywhere." Authors from

53 IA-CEPA ECP. "Limited access to assistive technology costs the economy up to 7% annually". - Press Release.
54 Marianne K. Dove, *Advancements in Assistive Technology and assistive technology Laws for the Disabled*, 2012, (DKG: Delta Kappa Gamma, 2012), http://www.deltakappagamma.org/NH/Summer%202012%20-%20Educational%20Technology-web.pdf

various nations develop and evaluate international standards according to established procedures, and suggestions for their scope and substance have been published.[55]

Such a standard should use a common language and be based on multidisciplinary conceptual frameworks. A process standard for assistive technology should ensure that the user is kept at the center of all activities, acknowledge the need to think about preventative steps that may reduce the amount of assistive technology required, and address the variables that affect user satisfaction with or disuse of assistive technology. It would be possible to incorporate current and developing performance standards at the individual and organizational levels within a standardized framework for assistive technology service. It would serve as a forum for the development and support of additional plans and tools aimed at enhancing the availability of assistive technology all over the world. Out of the 114 nations that participated in the 2005 "Global Survey on Government Action on the Implementation of the Standard Rules on the Equalization of Opportunities for Persons with Disabilities," 48 percent lacked assistive technology policies in place, and half had not yet passed relevant legislation. Given the significance of government policy at every level of the educational system, this presents significant difficulties for children and their families.[56]

In addition to creating legislation, it's also important to focus on enforcing the promises included in legislation. For example, article 4.1g of the UNCRPD states "to undertake or promote research and development of, and to promote the availability and use of new technologies, including information and communications technologies, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost."[57] Although this was promised in 2008, assistive technology is still considered unavailable or too costly for people with disabilities. To make matters worse, this provision of services may be more challenging in areas where resources are limited, and their government is poorly structured. The CRPD recommends that this cooperation cover the supply of assistive technology.[58] Signatories to the CRPD have vowed to cooperate, both technically and economically. Wealthy nations and organizations are morally obligated to help underdeveloped nations increase the accessibility of goods and services, which will solve poor governmental infrastructure. In addition, the CRPD advises that less developed nations ask other signatories for similar collaboration on behalf of their citizens. The CRPD specifically mentions this type of international collaboration, which has only been investigated in a few papers. As a result, it is important to research and monitor how different nations' international cooperations treat assistive technology. The CRPD could be implemented more effectively with the development of collaboration strategies and techniques.

A great example of legislative action created as a result of the UN's CRPD occurred in 2011 and then again in 2013 in Tajikistan, where its government produced resolution No. 604 on "Rules on the provision of assistive devices to people with disabilities" and resolution No. 295 on "List of specialized assistive devices and individual use products for people with disabilities, with supply and import exempted from value-added tax and customs duties." Following this legislation, Tajikistan focused on four main articles from CRPD to model their resolutions: Article 4 (general obligations), Article 20, (personal mobility), Article 26 (rehabilitation and rehabilitation), and Article 32 (international cooperation).[59]

Addressing Article 4 gave the provided background on the issue and ultimately provided a strong understanding to the government on what is expected of them. Article 20 focuses on the importance of independent mobility, which is fundamental in lower-developed countries that have more volatile conditions, so their constituents cannot depend on

55 Balram Bhargava et al., *Global Report on Assistive Technology*.
56 Thuraya Khalil, "Global Survey on Government Action on the Implementation of the Standard Rules on the Equalization of Opportunities for Persons with Disabilities" (Office of the UN Special Rapporteur on Disabilities, October 2006), https://www.un.org/disabilities/documents/srreports/gsr30jan07.doc.
57 "United Nations Convention on the Rights of Persons with Disabilities (CRPD)," United Nations, Accessed July 31, 2023
58 "Convention on the Rights of Persons with Disabilities," OHCHR, 2023, https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities.
59 "Assistive Technology in Tajikistan: Situational Analysis," accessed November 1, 2023, https://www.who.int/europe/publications/i/item/9789289054102.

them in the long run. This also ties in with Article 32, which calls for international cooperation. By collaborating with higher-developed countries, lower-developed nations gain access to resources they would not have on their own. Finally, Article 26 includes preventative measures that keep nations on track, rather than regressing after time and money has been irreversibly spent.[60]

The provision of essential services for assistive technology is sometimes disregarded; for instance, not everyone has access to repair services, and service procedures frequently do not involve user training and follow-up. With the need to increase availability, there are difficulties due to a lack of financing and resources. The range, quality, and availability of assistive devices through public provision are insufficient to satisfy demand. Overall, nongovernmental and international organizations play a significant role in the development of assistive technology through the provision of high-quality assistive goods, materials, and equipment, training of students, and funding of their international studies. There is a long history of great success in international cooperation among government institutions. One notable example in healthcare is the Global Polio Eradication Initiative (GPEI), where different international bodies, governments, and non-governmental organizations worked together on efforts to eradicate polio disease worldwide. Launched by WHO and UNICEF in 1988, GPEI is an example of how collaboration in the healthcare sector, through data sharing, resource mobilization, and governmental commitment, can lead to the achievement of global health goals. With appropriate collaboration between governmental bodies, similar feats can be achieved in access to assistive technology.[61]

Providing Assistive Technology During Humanitarian Crises

In 2020, the United Nations High Commissioner for Refugees (UNHCR) recorded over 48 million internally displaced persons worldwide. According to the World Health Survey, approximately 15 percent of this population has some sort of disability and needs an assistive device. However, it must also be noted that there are inadequate surveying services, therefore there may be unknown differences in the data within war zones. Refugees with disabilities are in unique situations since they have little to no control over what happens to them and their living situations. Therefore, it is important to note how stigma and prejudice surrounding assistive technology may weaken their influence and overall effectiveness.[62]

A 2021 study conducted in Malawi involving children with disabilities found a positive correlation between someone's age and gender and their use of assistive technology. Children ages nine to seventeen more often used assistive technology than children ages two to eight. However, they also found a more prominent connection between parental attitudes and policy environment, indicating the strong need for systemic improvement regarding governments and stigma towards assistive devices. The children in the older age group were thought to need assistive technology more, due to their better understanding of the technology. But also, parents did not want their younger children to rely on these devices for developmental aid. Disability-related prejudice affects refugees and asylum seekers in a variety of ways, which negatively affects their health and makes it harder for them to enter higher education and the labor market. In addition, almost half of people with disabilities do not have access to the healthcare they require.[63]

The majority of people with disabilities, especially those who live in rural regions or have been forcibly evacuated, are more frequently invisible. They are rarely the focus of policy, which results in a lack of their voice in any decision that has an impact on their well-being. Only if and when their aim and programs are established in line with the standards of the CRPD are these instruments crucial in making these populations apparent. The mainstreaming of disability concerns in all agendas and initiatives is necessary to make them suitable for refugees. It also entails, in the case of the Global Compact and the

60 "Convention on the Rights of Persons with Disabilities."
61 "Our Mission," *Polio Global Eradication Initiative*, accessed August 26, 2023, https://polioeradication.org/who-we-are/our-mission/#
62 Marco Tofani et al. "Disability, Rehabilitation, and Assistive Technologies for Refugees and Asylum Seekers in Italy: Policies and Challenges." *Societies 13*, no. 3, 2020, https://doi.org/10.3390/soc13030063
63 Jamali-Phiri, M, E.M Smith, and J.A. Kafumba. "Socio-Demographic Factors Influencing the Use of Assistive Technology among Children with Disabilities in Malawi." https://doi.org/10.3390/ijerph18063062

A male doctor checks the heartbeat and breathing of a boy using a stethoscope during a medical care operation in Lashkar Gah district of Helmand province

Credit: ISAF Headquarters Public Affairs Office

Declaration, utilizing the broad multi-stakeholder approach to tackle socioeconomic difficulties that affect those who have been forcibly displaced as well as the host communities. The market for assistive technology is small and primarily meets the needs of high-income environments. Small-scale local producers and suppliers cannot serve all people who require assistive technology in low-income nations. Services for assistive technology are frequently in short supply as well. There is only a small selection of assistive devices available to a few users due to difficulties in ensuring a consistent supply of assistive items and their replacement components due to a lack of policies, funding, logistics, research, or excessive customs and excise taxes.[64]

After analyzing the need for assistive technology, it is clear there are many sorts and levels of response required. The World Federation for Neurorehabilitation (WFNR), among other organizations, has responded at the advocacy level and released a statement on neurorehabilitation in developing countries. Both of these offer recommendations for creating policies, but it is not always obvious who will be able to do so or who can gather enough support to guarantee that policies are implemented. Partnerships between clinical departments in high-income nations and their peers in lower-middle-income countries are significant at the clinical level and have the potential to be sustainable. One such collaboration is the educational alliance formed by the University of Antananarivo in close cooperation with the Ministry of Health in Madagascar and Leeds Educational Hospitals. The non-profit Optin, which coordinates all the instruction and volunteer support, is in charge of managing this. The Society of PRM of Madagascar was established as a result of this partnership, originally by graduates of the training (Diplôme Universitaire), and is currently in charge of identifying the need for additional training. People from the UK provided the majority of the training, which followed a curriculum created to address the clinical needs of the area. Overall, these examples display the importance of international collaboration to provide sufficient assistive technology to countries that cannot sustain themselves. However, many initiatives are making an effort to offer assistive technology, and these tactics urgently require evaluation. It is important to further investigate and record the use of community-based rehabilitation for service delivery. Lessons could be drawn from research on funding plans and nations with extensive delivery networks. Such information is essential for directing the creation of just and cost-effective national service delivery systems. When new services are established, the dearth of properly educated individuals will worsen. As a result, it is

64 Anne Chamberlain and Alan Tennant. "Supporting Rehabilitation in Developing Countries," *Journal of Rehabilitation Medicine 47*, no. 5, 2015, https://doi.org/10.2340/16501977-2005

necessary to identify acceptable professions to carry out service delivery and build suitable training programs.[65]

It is well known that new public policies typically begin as prototypes so that they can be altered before being implemented on a large scale. Additionally, scaling up is recognized to be far more difficult than pilot initiatives, since it calls for a higher level of national agreement and policy consistency across time. With this in mind, the value of data in supplying decision-makers with the knowledge they need to change and maintain assistive technology-related policies over time and at scale, preventing new policies from putting an end to the level of new projects being implemented. To improve access to assistive technology, it is crucial to make sure that data is gathered in a way that takes apart children with disabilities according to criteria like age, disability, and access to assistive technology, is nationally available, is universally comparable, and is updated over time. Data validates helpful changes to policies and fruitful collaboration between the public and private sectors, as well as civil society organizations that provide various forms of aid. It sheds light on barriers like knowledge, training, or funding gaps, which can then be addressed by policymakers. To improve outcomes for assistive technology users, isolated assistive technology provisioning projects can gradually be integrated into a nationwide system thanks to access to trustworthy and comprehensive data. This is especially important when considering humanitarian crises, where data is scarce due to under-reporting, stigma, and lack of expertise.[66]

Thus, one of the first critical steps in providing assistive technology during a humanitarian crisis is conducting rapid needs assessments. These assessments aim to identify the immediate requirements of individuals with disabilities, such as mobility aids, communication devices, or devices to assist with daily living activities. They also help determine the extent of damage to existing assistive technology infrastructure and the availability of local resources to meet these needs.[67]

A notable surge in awareness and advocacy marked the present landscape surrounding the provision of Assistive Technology (assistive technology) during humanitarian crises for the rights and needs of individuals with disabilities in emergency settings. This heightened consciousness has been accompanied by an array of global commitments and frameworks, most notably the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and the Sendai Framework for Disaster Risk Reduction, which underline the imperative of inclusivity and accessibility in disaster response and risk reduction strategies. Moreover, humanitarian organizations and agencies have revised their guidelines to encompass the inclusion of assistive technology in their disaster response protocols, reflecting a growing recognition of the essential role of assistive technology in promoting resilience and recovery among this vulnerable population.[68] Collaborative efforts with local disability organizations and experts have become a pivotal aspect of assistive technology provision, ensuring that the unique needs of individuals with disabilities are understood and addressed in the specific context of each crisis.

However, significant challenges persist, including funding constraints, logistical complexities in delivering assistive technology to remote or conflict-affected areas, and the ongoing need for adequately trained personnel to customize and maintain devices. The COVID-19 pandemic has further underscored the vulnerability of individuals with disabilities during public health emergencies, prompting the acceleration of telehealth and virtual support for assistive technology assessment, training, and support.[69] While substantial progress has been made in advancing assistive technology inclusion during humanitarian crises, the landscape remains dynamic, emphasizing the necessity of ongoing collaboration, innovation, and dedication to ensuring assistive technology access in times of crisis.

Many countries have poor or non-existent access to assistive

65 Anne Chamberlain and Alan Tennant. "Supporting Rehabilitation in Developing Countries."
66 Fernando Botelho, "Childhood and Assistive Technology: Growing with Opportunity, Developing with Technology," *Assistive Technology 33*, no. 51, 2021, https://doi.org/10.1080/10400435.2021.1971330
67 Gavin Wood and Golnaz Whittaker, *Assistive Technology in Humanitarian Settings*, (Italy: UNICEF, 2022), https://files.eric.ed.gov/fulltext/ED620397.pdf.
68 Gavin Wood and Golnaz Whittaker, *Assistive Technology in Humanitarian Settings.*
69 Amal Harrati, Sarah Bardin, and David R Mann, "Spatial Distributions in Disaster Risk Vulnerability for People with Disabilities in the U.S.," *International Journal of Disaster Risk Reduction* 87 (March 1, 2023): 103571–71, https://doi.org/10.1016/j.ijdrr.2023.103571.

technologies in the public sector. This leads to a high number of out-of-pocket payments that are a burden for users and their family when it comes to their economy. People in poorer countries normally rely on donations or charitable services to access the technology they need. These donations often provide large quantities of substandard or used products, which can be detrimental to people with disabilities since the equipment is not in its best condition. People in humanitarian emergencies also rely on these resources to get access to assistive technology.[70]

In humanitarian emergencies, there is often a need for assistive devices since people with pre-existing conditions often lose their devices in many cases, and people who were injured may be in need of this type of technology for the first time.[71] Ultimately, providing assistive technology during humanitarian crises is a comprehensive and inclusive approach that not only upholds the dignity and well-being of individuals with disabilities but also contributes to more effective and equitable emergency response efforts. Recognizing and addressing the specific needs of this vulnerable group is a fundamental aspect of humanitarian work, fostering resilience, and recovery in the wake of crises. Furthermore, the provision of assistive technology during humanitarian crises should not be limited to immediate relief efforts. Long-term planning is essential, encompassing rehabilitation services and the continued supply of assistive technology devices to support individuals in rebuilding their lives.

Furthermore, promoting the inclusion of individuals with disabilities in post-crisis community development and rebuilding efforts is essential, ensuring that they are not left behind and can actively participate in rebuilding resilient and sustainable communities.

Current Status

Recent Action Conducted to Spread Assistive Technology

Everyone will probably require assistive technology at some point in their lives, especially as they get older. Some people will only have brief spells of functional challenges, such as after an accident or major sickness. People who were born with a disability or functional challenge could need to use AT for a longer time or even their entire lives. Chronic or acute medical disorders might make it difficult to do daily tasks like walking, seeing, hearing, understanding, speaking, or other unavoidable and necessary daily tasks. This is proven to be true, as evidence suggests that the need for AT is rising globally. According to one estimate of the world's requirement for rehabilitation, the most common problem is musculoskeletal disorders. Also, at least one in three people will require treatment at some point during their illness or injury. Due to the increased functional challenges brought on by these illnesses, there will be a greater demand for interventions that support self-management, healthy lifestyles, and rehabilitation.[72]

According to the World Health Organization (WHO), 10 percent of the world's population has a disability, which can have an impact on social, educational, and/or economic outcomes. There may be 600 million people worldwide with special needs in terms of healthcare, education, rehabilitation, suitable assistive technology, and social support, despite the shaky foundation of such numbers. According to statistics, 80 percent of persons with disabilities reside in low-income nations, where their living conditions are extremely difficult, and they have little access to medical treatment, rehabilitation, and AT. Greater illiteracy rates, worse nutritional status, lower vaccine coverage, lower birth weight, greater rates of unemployment and underemployment, and reduced occupational mobility are all linked to higher disability rates in developing nations, according to case studies. The opportunities for people with disabilities to participate in

70 "Priority Assistive Products List". *World Health Organization. USAID, The GATE Initiative.* January 2016. https://iris.who.int/bitstream/handle/10665/207694/WHO_EMP_PHI_2016.01_eng.pdf?sequence=1
71 Rohwerder, Brigitte. "Assistive technologies in developing countries". Institute of Development Studies. [PDF]. March 1, 2018. https://assets.publishing.service.gov.uk/media/5af976ab40f0b622d4e9810f/Assistive_technologies_in_developing-countries.pdf
72 Alarcos Cieza. "Global Estimates of the Need for Rehabilitation Based on the Global Burden of Disease Study 2019: A Systematic Analysis for the Global Burden of Disease Study 2019," *The Lancet 396*, no. 10267, 2020, https://doi.org/10.1016/S0140-6736(20)32340-0

their societies and live independently are increased by assistive devices and technology like wheelchairs, prostheses, hearing aids, and adapted computer software and hardware. A WHO report on disabilities shows that more than 1 billion people, or over 15 percent of the world's population, have some kind of disability, and the prevalence of disabilities is generally rising around the world. According to the report, roughly 80 percent of people with disabilities reside in developing nations, suggesting that the prevalence of disability is higher in low-income nations. People with little financial resources have less access to healthcare treatments. Only 5–15 percent of all disabled people in low- and middle–income nations are thought to have access to various assistive goods. As a result, there is an increasing number of people with disabilities with unmet healthcare needs and a lack of suitable assistive solutions.[73]

In low-income nations, there is a lack of information and awareness on AT. This is true for the supply, demand, quality, and impact of AT on the well-being of people with disabilities. For instance, some have said that wheelchairs frequently provided in low-income nations are of poor quality. According to experts, the two most popular wheelchair distribution techniques are either used wheelchairs given with little service support or mass-produced wheelchairs delivered in high- or middle-income countries. In addition, it is common for wheelchair replacement components to be unavailable. The majority of donated items are made for indoor usage only and are not effective for active users in harsh situations. A significant document that has had a significant impact on the future of persons with disabilities is the UN Resolution titled "The Standard Rules for Equalization of Opportunities for People with Disabilities." This resolution claims that "States should ensure the development and supply of support services, including assistive devices for persons with disabilities, to assist them to increase their level of independence in their daily lives and to exercise their rights." The resolution further insists that "States should support the development, production, distribution, and servicing of assistive devices and equipment and the dissemination of knowledge about them," as well as "ensure the provision of assistive devices and equipment according to the needs of persons with disabilities, as important measures to achieve the equalization of opportunities."[74]

There are an estimated 135 million people with severe vision impairment and about 37 million people who are blind worldwide. According to estimates, 80 percent of blind adults worldwide are unable to find employment due to a lack of training programs and AT, while 90 percent of blind children around the world do not have the opportunity to attend school. A further estimate from WHO places the number of persons who potentially benefit from hearing aids at about 250 million worldwide. The majority of these people do not wear any kind of hearing aids and reside in low-income nations. According to the United Nations Statistical Office, 20 million people worldwide lack access to wheelchairs[75]. To have a better understanding of the number of people in need of access to this type of healthcare, in 2022 data from 35 countries and approximately 330,000 people were gathered by UNICEF for the Global Report on Assistive Technology. The findings from this survey found that more than 2.5 billion people are thought to benefit from one or more assistive items, according to the WHO/United Nations Children's Fund (UNICEF) estimates based on representative self-reported population surveys in 29 countries. By 2050, this figure is anticipated to surpass 3.5 billion due to aging populations and an increase in noncommunicable diseases worldwide. Numerous elements, such as a person's functional capacity, level of consciousness, socioeconomic status, living environment, and interactions with the environment affect the requirement for assistive items. However, there is a considerable access disparity between nations on a worldwide scale. The results of the survey reveal that estimated access or the percentage of persons with needs who had those needs met ranged from 3 to 90 percent [76]. The Human Development

73 "World Report on Disability". *World Health Organization*, 2011. https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability.
74 "Standard Rules on the Equalization of Opportunities for Persons with Disabilities". *Office of the United Nations High Commissioner for Human Rights.* (New York: United Nations General Assembly, 1993), https://www.ohchr.org/en/instruments-mechanisms/instruments/standard-rules-equalization-opportunities-persons-disabilities
75 "Fact Sheet on Wheelchairs." *World Health Organization.* 2010. https://apps.who.int/iris/bitstream/handle/10665/205041/B4616.pdf?seq
76 "UNICEF and WHO Launch the First Global Report on Assistive Technology." *United Nations Children's Fund,* 2022, https://www.

Index, a combined statistic of life expectancy, education, and per capita income, varies according to both need and access to assistive devices.

Another survey was conducted with Member States in 2022, and nearly all of them have at least one law governing access to AT, as well as a ministry or other administrative body in charge of it. The majority of nations had a public budget set aside for AT and a finance system or mechanisms in place to partially or fully cover users' fees for AT. Several nations had laws, norms, or directives in place regarding AT. However, despite having these laws put in place, many nations indicated significant service and workforce shortfalls for AT, particularly in the areas of cognition, communication, and self-care. With these surveys in mind, it is important to note that surveying and data collection are immensely difficult to collect, which is due to many factors such as social stigma, lack of outreach, and lack of awareness amongst constituents about the survey. This was recognized by WHO in 2018, which led to the creation of a rapid assistive technology assessment (RATA) questionnaire.[77] Self-reporting is a realistic and reliable survey approach, particularly in environments with minimal resources, despite some of its drawbacks. Six topics relating to assistive goods are covered by the RATA questionnaire: use, source, funding, satisfaction, unmet need, and barriers to access. These factors also take into account the accessibility of sources and the suitability of aids for their locations of employment. The RATA questionnaire can also be used to analyze the prevalence of need and availability of various critical assistive items that are included in the WHO Priority Assistive Items list, which was created as a legislative model for countries to create their own Priority Assistive Items list.

The RATA questionnaire was used to collect data by December 2021 in 35 countries, involving around 330,000 people. Azerbaijan, Bhutan, Djibouti, Dominican Republic, Georgia, Indonesia, Italy, Jordan, Kenya, Maldives, Poland, and Ukraine are all examples of countries that have conducted national population surveys. In one or more regions of China, Guatemala, India, Malawi, and Tajikistan, subnational population surveys were conducted. Additionally, surveys were carried out in Sierra Leone, the United Kingdom, Bangladesh, Brazil, Costa Rica, Costa Rica, Indonesia, the United Republic of Tanzania, and Costa Rica. Among all categories of assistive items, the requirement for glasses was the greatest in each of the countries studied. The most often required items included hearing aids, a variety of assistive equipment supporting mobility, including walking sticks and crutches, shower, bath, and toilet chairs, as well as various wheelchairs, orthoses, and prostheses. Based on the results, it was found that approximately 31.3 percent of the global population requires some form of assistive technology, which accounts for about 2.5 billion people globally. Additionally, it was revealed that while the prevalence of need is lower in younger age groups, almost two-thirds of the world's population of 60 years and older need at least one assistive product. Globally, at least 2.2 billion individuals have a visual impairment or blindness brought on by eye disorders such as cataracts, trachoma, and refractive error, according to estimates in the WHO World Report on visual, which was published in 2020. The high incidence of visual impairment is reflected in the high prevalence of self-reported need for spectacles in the investigated nations, even if assistive technology cannot treat all eye problems[78]. According to an estimate based on the Global Burden of Disease study, 401 million persons worldwide who have hearing loss ranging from moderate to severe would likely benefit from using hearing aids. Furthermore, according to the WHO World Report on Hearing, the prevalence of hearing loss (of moderate or higher grade severity) rises exponentially with age, from 15.4 percent in individuals aged 60 to 69 to 58.2 percent in people over 90.[79]

From what has been analyzed, it is clear that AT will develop into a vital field of healthcare as the world population ages. The population of the world is aging at a disproportionate rate, with the number of people 60 or older more than doubling from 382 million to 1.05 billion between 1980 and

unicef-irc.org/article/2275-unicef-and-who-launch-the-first-global-report-on-assistive-technology.html
77 Arne H. Eide, "Measuring Self-Reported Access to Assistive Technology Using the WHO Rapid Assistive Technology Assessment (RATA) Questionnaire: Protocol for a Multi-Country Study." *National Library of Medicine*, 2017, https://doi.org/10.3390/ijerph182413336
78 "World Report on Vision". (Geneva: World Health Organization, 2019), https://www.who.int/publications/i/item/9789241516570
79 "World Report on Hearing". (Geneva: World Health Organization, 2021), https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/highlighting-priorities-for-ear-and-hearing-care

Capt. Kelly Elmlinger of the US Army showing her prosthetic leg

Credit: Marcy Sanchez

2020. By 2050, it is anticipated that there will be almost 2.1 billion elderly people worldwide.[80] The ability of elderly persons to care for themselves, participate in, and contribute to society can be severely hampered by significant decreases in their physical and mental capabilities. Access to therapy, helpful technology, and supportive inclusive surroundings can enhance and promote functional capacity and, as a result, well-being and involvement. It has also been recorded that accessing assistive technology is more difficult for women and people with impairments among older adults. To achieve some basic needs, such as accessing assistive items, women are more disadvantaged than males due to gender inequality, age-based discrimination, and ageist views. Additionally, it must also be remembered that a country's geographical and socioeconomic conditions will ultimately affect the methods that can be used to provide AT. Along with this, the population size of a country also impacts the quantity of humanitarian assistance required. In 2022, Eastern and South-Eastern Asia had 2.3 billion people, or 29 percent of the world's population. Central and Southeastern Asia had 2.1 billion people, or 26 percent of the world's population. Both of these regions were in Asia. With populations of about 1.4 billion apiece, China and India made up the majority of the people in these two areas. These were severely impacted by the COVID-19 pandemic, which has still left lasting impacts on the entire international community. All types of human mobility, including international migration, were severely constrained by the COVID-19 pandemic, which had impacts on the transportation, distribution, and importation of AT. Data shortages also make it challenging to estimate the pandemic's impact on the magnitude of migration trends, which is one of the largest issues regarding AT. To provide adequate assistive healthcare, there have been various recommendations to improve legislation, implement infrastructural-based solutions, as well as prioritize data collection within developing countries. By doing so, it is expected that AT will be provided in all corners of the world, especially in areas that are hard to travel to.[81]

Case Study: Situation in Tajikistan

In 2010, Tajikistan was recorded to have the largest polio outbreak in the world since 2005. As a result, a significant amount of the country's population was debilitated, mainly children, and developed impairments that required long-term rehabilitation care.[82] Some examples of these impairments include cerebral palsy, congenital anomalies, and other

80 "World Population Prospects 2022: Summary of Results," *United Nations,* 2022, https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022_summary_of_results.pdf
81 "World Population Prospects 2022: Summary of Results."
82 Malika Makhkambaeva, "Disability and Rehabilitation Project," *USAID*, 2022, https://2017-2020.usaid.gov/tajikistan/fact-sheets/

exhausting conditions. Overall, the 2010 polio outbreak in the country is what made this a unique case, as the country already was volatile in terms of healthcare distribution. In general, doctors and surgeons knew relatively little about the medical and rehabilitation requirements of polio victims. In Tajikistan, there were just 15 orthopedic surgeons, 13 of whom practiced in Dushanbe, the nation's capital. All of these surgeons had received training following old recommendations that surgery for polio patients should not be done before the age of 14. Before the 2010 polio outbreak, the majority of surgeons had encountered no more than three patients with polio during their professional careers, despite the outstanding number of children affected by the outbreak.

After seeing the lasting effects of the outbreak on the country, organizations decided to help. From 2017 to 2020, Tajikistan combatted this and implemented a provisional list in compliance with objectives from the National Programme on Rehabilitation of Persons with Disabilities (NPRPD). The money allocated to assistive technology was generously provided by the United States Agency for International Development (USAID) and has continuously increased. The selection of assistive products offered by the government has expanded, and facilities for AT have been renovated in Tajikistan, which has made great strides toward increasing access to AT. After Tajikistan first initiated action on increasing AT access in 2017, the country signed the Convention on the Rights of Persons with Disabilities (CRPD) in 2018, reaffirming its commitment to ensuring AT access. The approval of World Health Assembly resolution WHA71.8 greatly impacted legislative development for AT and significantly influenced the government of Tajikistan.[83]

Before they endorsed the CRPD, Tajikistan had no record of the national strategy to combat the lack of AT. However, this would change in 2018 when Tajikistan became a signatory member of both the CRPD and the National Programme on Rehabilitation of Persons with Disabilities. Essentially, this program's intentions with Tajikistan were to outline an action plan that would improve access to assistive technologies and devices. This action plan called for increasing government funding, enhancing knowledge among stakeholders on assistive products, establishing maintenance and repair facilities, and improving procurement by expanding the range of assistive devices available. Before NPRPD stepped in, Tajikistan had a lengthy process to allocate government-funded assistive devices to the people, where they were required to submit an application, visit a healthcare facility to validate their eligibility, obtain a prescription for the devices they required and the local social protection department issues a request to the Ministry of Health and Social Protection. This was the way devices were distributed from approximately 2015 to 2018 until the government met with stakeholders to create a new assistive products list (APL). The importance of this list was to decide what devices the government would be responsible for providing, as well as making it easier for disabled persons to see what was available to them.[84]

When this list was last updated, a recorded 39 percent of the population lived below the poverty line. Being disabled can result in lower living standards and poverty due to lack of access to education, employment, and earnings, as well as higher health care costs. Poverty increases the likelihood of impairment through malnutrition, inadequate health care, and unsafe living conditions. Due to stigma and prejudice, people with disabilities frequently encounter environmental and informational hurdles. Therefore, hurdles to their effective and meaningful participation in decision-making linked to health and rehabilitation services are created by the low socioeconomic conditions of people with disabilities. Furthermore, the majority of assistive products are only available in Dushanbe or Khujand in Tajikistan. In Tajikistan, 73.6 percent of the population resides in rural areas and must travel great distances to reach urban areas, which is increasingly difficult for those who live below the poverty line.[85]

disability-and-rehabilitation-project
83 Satish Mishra et al., "Disability and rehabilitation in Tajikistan: development of a multisectoral national programme to leave no one behind," *Public health panorama* 4, no. 02, 2018, https://apps.who.int/iris/bitstream/handle/10665/325032/php-4-2-202-209-eng.pdf
84 Satish Mishra et al., "Disability and rehabilitation in Tajikistan: development of a multisectoral national programme to leave no one behind."
85 Satish Mishra et al., "Disability and rehabilitation in Tajikistan: development of a multisectoral national programme to leave no one behind,"

In Tajikistan, assistive items are not produced on a significant basis. Only two companies, Sughd and Vakhsh, make wheelchairs and other mobility aids; their combined annual production is less than 50 wheelchairs. Small-scale manufacturing operations (SEOP or NGO) and nongovernmental organization workshops produce mobility aids like walkers, standing frames, and postural support chairs. An example was set by Tajikistan when they worked with Operation Mercy, an NGO that provides assistive devices in areas where they are scarce. Within the years they stayed in Tajikistan (2015-2018), they donated 569 wheelchairs of different models. Additionally, the method of distribution by Operation Mercy should be noted, where they distributed 277 of these wheelchairs from a local workshop in the Sughd Region. By doing so, residents in areas that are hard to travel to or are rural had the opportunity to receive the devices they needed. Another example of an NGO providing their assistance was Caritas, which provided social agency home-based units (SAHU) as well as implemented a system that allows them to lend wheelchairs to beneficiaries for a certain time. If this was not enough help, Caritas also developed training manuals and programs for local carpenters, which has led to both improvements in the quality of healthcare and economic opportunities for Tajikistan. These two NGOs are a great example of the success that can be achieved if countries choose to work with them to fight against certain conflicts. Along with these organizations, the UN has also contributed to efforts to provide more assistive technology. In December 2015, WHO conducted basic training for wheelchair services, where attendees would learn how to properly fit, use, and adapt to their wheelchairs.[86] Not only did this aim to spread awareness of the importance of assistive devices, but it also prevented misuse and potential waste of wheelchairs, since a significant number of participants in surveys conducted in this region have stated their inability to use their wheelchairs due to malfunctions or ill-fitting parts.

On top of this, only two prosthetics and orthotics professionals were employed in Tajikistan at the time. There were no formally qualified physiotherapists, occupational therapists, speech-language therapists, or specialists in physical medicine and rehabilitation. Additionally, Tajikistan lacked training programs and educational resources in these areas, and doctors and nurses, as well as other members of the medical community, had a limited understanding of disability and rehabilitation. With these conditions in mind, the importance of these plans of action is perfectly displayed. One of the major obstacles impeding the development of the assistive technology industry is the shortage of qualified specialists and rehabilitation professionals. There are no qualified speech therapists, wheelchair technicians, physiotherapists, occupational therapists, or hearing aid technicians. The country's rehabilitation policies are unfavorable to specialists' ability to advance their careers. There is little perceived need for them and the talents they bring because the nation's rehabilitation system has historically run without them. Additionally, certain specialists in AT and rehabilitation do not have official recognition. For instance, the All-Republican Classifier of Occupations in Tajikistan excludes speech therapists and prosthetists from the list of occupations. Although the latter lists physical and occupational therapists, these occupations lack any required education, training, or licensing. Training non-specialists, such as nurses and CBR employees, in assistive devices becomes crucial in the absence of skilled AT professionals. Although "generalists" can deliver many assistive devices with little training, health professionals regretfully do not receive any pertinent training in AT.[87]

Even the commissioners of the Agency for Medical and Social Examination have limited knowledge of the assistive items available and their uses. Medical doctors are also not trained in the usage of assistive devices. The introduction of rehabilitation and assistive technology courses for physicians and nurses is part of the multisectoral NPRPD 2017–2020 action plan, which will address the requirement for recent graduates entering the labor market to be equipped with these abilities. International and nongovernmental organizations, such as UNICEF and WHO, have offered a variety of brief training sessions on rehabilitation and assistive technology. Although participants praised these courses highly, sustainability is still a concern in the absence of institutional supervision and ongoing instruction. The absence of official

86 Sara Munera et al., "Disability and Rehabilitation Project," *National Library of Medicine*, 2017, https://doi.org/10.4102/ajod.v6i0.360
87 Sara Munera et al., "Disability and Rehabilitation Project."

government-recognized certification for these courses and the lack of opportunity for participants to update and refresh their knowledge were other issues raised by participants. Since 2018, there have not been any significant efforts to increase educational opportunities for healthcare providers, and it has been recommended by WHO for the implementation of more lasting solutions to mitigate this. In many countries, rehabilitation professionals need better formal training, regulation, and recognition. Opportunities to gain experience and mentoring are also required to enlarge the cohort of available professionals. Adequate working conditions, including compensation, are important for retaining trained professionals. This is particularly applicable to Tajikistan, where a long-term solution is needed to address the lack of rehabilitation professionals.[88]

To summarize, there have been many honorable efforts done to combat the lack of AT within the country. Over the past few years, the sector has seen a lot of favorable changes. In March 2018, the government committed to providing AT by signing the Convention on the Rights of Persons with Disabilities. The multisectoral NPRPD 2017-2020 was approved in 2016. This lays forth a thorough strategy for growing the assistive technology industry. The budget for assistive technology has grown over time and is expected to continue to do so dramatically in the years to come. In 2019, the budget will exceed TJS 2 million. The approval of WHA resolution WHA71.8 on expanding access to AT in May 2018 and the associated side event were both significantly influenced by the government of Tajikistan. The creation of the national APL has expanded the selection of assistive products made available by the government. To assist the government in planning the purchase of these products, estimates of the need for the various products on the APL were also derived from surveys conducted with the public. The APL enhances accessibility to more devices and defends the right of more people with disabilities to equitable participation in society. Technical requirements for the items on the APL are already in the works; they will improve procurement procedures and guarantee the caliber of equipment imported into the nation. It has also been accepted and enforced that all possible users of assistive technology should be included in policies. It must also be noted that Tajikistan still enforces that only those who are officially classified as disabled are currently eligible for assistive technology. In addition to the fact that many people with handicaps are not registered with the government, many people without disabilities also require assistive items. This population was still represented in the APL, where several items on the list, such as reading glasses and safety shoes, are mostly utilized by those who suffer from non-communicable diseases. These individuals should be eligible for assistive items through government channels, and the requirements for eligibility should be adjusted to take them into account. With Tajikistan's National Strategy on Rehabilitation having expired in 2020, a team of experts from WHO visited and evaluated healthcare facilities across the country. Noting the limited supply of AT and qualified staff, WHO/Europe launched a joint project with ATscale and the Ministry of Health and Social Protection to reach a greater number of those who need these services. This initiative was started in January 2023 and hopes to bring AT to 15,000 people directly, and over 400 000 indirectly.[89] The hope is to not only expand the reach of AT in Tajikistan, but also to strengthen the workforce and increase global opportunities for the country. Alongside Tajikistan, ATscale hopes to increase AT reach in Azerbaijan and Georgia through 2027.

Although these improvements should be recognized, there are still many conflicts that must be addressed. There is a lack of information about the potential advantages of rehabilitation in reducing impairment and disability, improving functioning, and promoting inclusion and participation for people with disabilities within the healthcare system. There is also a lack of knowledge and understanding of rehabilitation. Resources still aren't enough to meet the need for assistive items across the country, despite these admirable efforts.[90] Particularly

88 Fanara Bunyadzada, "WHO Continues Work for Supporting Rehabilitation and Assistive Technology Services in Azerbaijan," *United Nations Azerbaijan*, 2022, https://azerbaijan.un.org/en/204776-who-continues-work-supporting-rehabilitation-and-assistive-technology-services-azerbaijan

89 "WHO Helps Tajikistan to Strengthen Rehabilitation Services and Assistive Technology," *World Health Organization*, February 17, 2023, https://www.who.int/europe/news/item/17-02-2023-who-helps-tajikistan-to-strengthen-rehabilitation-services-and-assistive-technology-.

90 Michael Zhu Chen et al. "Demographic and Environmental Factors Associated with Disability in India, Laos, and Tajikistan: A Population-based Cross-sectional Study," *BMC Public Health*, 2021, https://doi.org/10.1186/s12889-022-12846-1

qualified professionals in assistive technology are lacking in Tajikistan, and financing is still minimal. The field study found that the proper procedures of service providing are frequently not followed while distributing assistive products. Beneficiaries have thus been given assistive equipment that is ineffective, ill-fitting, or that they are unable to utilize. In such circumstances, the device's usefulness is constrained, and it is frequently abandoned or used infrequently. The things they received are of poor quality and durability, according to many users. Since almost half of the survey participants stated they had nowhere to turn for repairs, this issue is especially concerning. Additionally, many survey and focus group participants were either uninformed of their right to receive assistive items or did not know where or how to do so. The Tajik government has made significant strides toward recognizing the rights of people with disabilities and enhancing the availability of assistive technologies. Tajikistan's system for providing assistive products, which now includes service delivery facilities, qualified employees, and the purchase of high-quality goods at reasonable prices, will need to be further strengthened if it is to maintain its efforts and dedication. However, acknowledging that there is room for improvement is the first step towards creating a more inclusive community within Tajikistan.

Sustainable Development Goals

Secretary-General António Guterres states, "Unless we act now, the 2030 Agenda will become an epitaph for a world that might have been." Not only does this statement display the importance of the SDGs, but also the urgency to act on the goals and ensure their completion. In 2015, 193 countries in the UN General Assembly adopted the United Nations' Sustainable Development Goals. Since their implementation, they have acted as a typical guideline for various forms of policy in all corners of the world. When someone refers to the SDGs, they are referring to the 2030 Agenda for Sustainable Development, which includes 17 interlinked objectives and 169 total targets within these objectives. According to experts on the goals, "The goals cover a range of areas, including eradicating poverty, ensuring access to clean water and sanitation, reducing inequalities, and providing affordable and clean energy."[91] The SDGs promise to "leave no one behind," including those with functional limitations who require access to assistive technology and who can equally contribute to achieving the goals. Realization of the Sustainable Development Goals by, for, and with Persons with Disabilities, the UN Flagship Report on Disability and Development notes that the status of people with disabilities falls behind concerning the majority of SDGs. Some of the challenges that have been found include stigma and discrimination, problems with accessibility of digital and physical locations and materials, and a lack of access to necessary services and assistive technologies. In light of this, there is a rise in awareness of the need for high-quality, cost-effective, and dependable assistive devices on a global scale. Although it may not seem like it, AT can be related to all SDGs, even those that do not even mention healthcare. Assistive technology is just that, technology that assists those with disabilities to function. By allocating this type of aid, disabled people can be more involved in their community's infrastructure and overall development.

To display the importance of AT, a study was conducted in Malawi to determine how organizations within the country followed the SDGs. It was eventually determined that each of the SDGs was determined to be relevant to AT, which is in line with research suggesting that equal access to AT is essential in achieving all 17 SDGs. International collaboration is the subject of UNCRPD Article 32, which focuses particularly on international development aid.[92] International development programs must be inclusive of and accessible to people with disabilities, and this supports access to and sharing of AT through the transfer of technologies. By doing so, increasing AT access can lead to improvement in other areas.

Although AT can be involved in any SDG, it most aligns with SDG 3, which promises to "ensure healthy lives and

91 Chris Stokel-Walker, "Sustainable Development Goals: What are they and are we on track?" *Neste*, March 10, 2023, https://journeytozerostories.neste.com/sustainable-development-goals?utm_campaign=awareness_sem-us-california-brand-sustainability_corporate_neste_neste_always-on-advertising_usa-california---ca_b2b_new-customers_sus_2023_q2&utm_source=google&utm_medium=search_paid&gclid=CjwKCAjw29ymBhAKEiwAHJbJ8m6GrlTxIgOZFFLNUKdTWdSa2b-oSuJK_ua3hixv0BW6QwoUPM2qIhoC41wQAvD_BwE#
92 Emma M. Smith, "Relevance of Assistive Technology and the Sustainable Development Goals to Stakeholder Organizations in Malawi," *Global Health Action*, 2022, https://doi.org/10.1080/16549716.2022.2133381

promote well-being at all ages."[93] Since the SDGs emphasize the inclusion of the entire world's population, AT is essential to preventing isolated living conditions, poor health, and low quality of life for some populations (particularly the elderly and those with disabilities). When AT is unavailable to those who need it, there is also a higher risk of functional decline and the devastating effects of illnesses and disabilities on people, their families, and society as a whole. WHO has also identified AT as essential to advancing Universal Health Coverage and the SDGs. Wheelchairs, prosthetic limbs, eyewear, hearing aids, pill organizers, and accessible information and communication technology (ICT)[94] are a few examples of this AT. The provision of AT as a method for achieving the SDGs is justified by focusing on the relevance of AT to the attainment of the SDGs. Additionally, it serves to underline the fact that the effects of AT are extensive and transcend beyond health and well-being. Although there is evidence of this connection in the works of experts, no work has been done to show it from the viewpoint of disabled persons who represent those who deal with AT issues firsthand. This is crucial because these parties are heavily involved in promoting AT systems and policies. With the UN's SDG 3 in mind, it's important to ensure the voices of disabled persons are included in increasing access to assistive technology.

Bloc Analysis

Points of Division

According to WHO, more than a billion people worldwide will require assistive technology by 2021, and by 2050, that number is expected to double.[95] People who have daily limitations due to a disability, noncommunicable disease, or aging can become more independent with the help of assistive technology. The following six functional categories can all be helped by assistive technology, in general: hearing, vision, mobility, self-care, communication, and cognition. Along with strong evidence supporting its cost-effectiveness, AT has the potential to free people with limitations brought on by aging, illness, or disabilities from marginalization, give them the freedom to live the lives they choose, and enhance both their own and others' quality of life.

It is also recorded that approximately only 10 percent of the global population that requires AT has sufficient access to it. This jarring statistic demonstrates the dire need for increasing access to AT, especially in areas that are less developed or do not have the sustainability to provide for themselves. Overall, one of the differing factors regarding AT is the availability of it around the world, which is why it is important to focus on the level of accessibility of AT in various parts of the world. By focusing on countries with a low level of accessibility, these countries can recognize the severity of the situation and ultimately work towards an urgent and effective plan of action. For countries that do not resonate with this and have moderate or high levels of accessibility, this information may urge them to collaborate and provide assistance to those who cannot help themselves.

To adequately address the need for AT in each country, the level of humanitarian aid and healthcare access they have must first be noted. Fortunately, the UN has taken the responsibility of recording this data through a rapid assistive technology assessment (RATA) created in 2018[96]. In correlation with WHA71.8, the RATA was utilized in 70 countries to properly record data on the population, including the level of barriers that some countries face when allocating resources, legislative development, and the satisfaction level of residents. This information is currently observed through the Global Health Observatory (GHO) Index, which is run through WHO. Although this was the primary source used, it's important to consider the countries that did not endorse WHA71.8 but have disabled persons living in their countries.

93 "Health - United Nations Sustainable Development," *United Nations*. September 7, 2023, https://www.un.org/sustainabledevelopment/health/

94 Chapal Khasnabis, Zafar Mirza, and Malcolm MacLachlan, "Opening the GATE to Inclusion for People with Disabilities." *The Lancet*, 2012, https://doi.org/10.1016/S0140-6736(15)01093-4

95 "Prevalence of coverage of assistive technology in the WHO European Region: A scoping review", *World Health Organization Regional Office for Europe*, 2021, https://apps.who.int/iris/bitstream/handle/10665/344520/WHO-EURO-2021-3173-42931-59954-eng.pdf?sequence=1&isAllowed=y

96 Wei Zhang, "Measuring Self-Reported Access to Assistive Technology Using the WHO Rapid Technology Assessment (RATA) Questionnaire: Protocol for a Multi-Country StudyAssistive," *National Library of Medicine*, 2021, https://doi.org/10.3390/ijerph182413336

To include these countries, information was also used from the Global Health Security (GHS) Index. These indexes use a 100-point scale, and the lower the number is, the lower the level of accessibility they have.

According to this index, countries with a high level of barriers to assistive technology include countries from Asia, Latin America, and Africa, such as Azerbaijan, Belize, and Benin. Typically, countries with a score between 0-35 are considered low, and these countries have a score so low that it is rounded to zero on the scale. Examples of countries with a moderate level of barriers regarding AT allocation include Bolivia, North Macedonia, and Peru. These are countries that have an index level of 50.0. Countries that are considered to have low-level barriers to accessibility of AT are countries with a score higher than 65, and some examples of these countries include China, France, and the United States of America. There are many similarities and differences between these examples, and it's necessary to focus on what makes them similar if they are successful in providing assistive technology, as well as what can be improved on with countries that have a lower index number. Overall, countries from different blocs will still be associated based on policy and the need to collaborate in an intergovernmental fashion. However, distinguishing countries based on their exposure to poor AT accessibility can lead to neoteric and accurate solutions that will work best in the region it's implemented in. By creating bloc-specific solutions, there will be less waste in terms of time and resources, and there will be significant improvements in the years to come in terms of access to assistive technologies.

Countries with Low Assistive Technology Access

One of the main focuses of this topic is providing relief to countries that are currently experiencing low volumes of assistive technology being used within them. Additionally, it's important to consider the factors that may contribute to the low impact of assistive healthcare in these countries. For countries to be considered to have high-level barriers to AT access, they must have had an index number lower than 30 on the GHS Index.

Encompassing countries like Bangladesh, Nigeria, Cambodia, Haiti, and Yemen, this bloc addresses the stark disparities in access to assistive technologies, particularly in low-resource settings. Their primary objective is to advocate for increased global support and investment to narrow the access gap for persons with disabilities in these nations. To accomplish this, they propose the establishment of a global assistance program aimed at providing financial and technical support to procure and develop essential assistive technologies. They also stress the importance of advocating for reduced import tariffs on assistive devices to make them more affordable and accessible in low-income countries. Furthermore, they seek to foster partnerships with international organizations and non-governmental organizations (NGOs) to support capacity-building and technology transfer initiatives. In doing so, they aim to uplift these nations, ensuring that persons with disabilities have access to the assistive technologies they need, thus promoting greater inclusivity and equal opportunities.

Countries with Moderate Assistive Technology Access

Although it seems that countries would have simply high or low levels of barriers, it should also be considered that countries may be attempting to improve their healthcare system, but are experiencing smaller or less severe conflicts than other countries that are simply going unnoticed. Countries that have a GHI Index number between 36 and 65 are considered to have moderate levels of barriers and difficulties when providing healthcare assistance. These can be unique cases, but the attempt to resolve these barriers can still be possible.

This bloc represents nations such as Brazil, India, South Africa, Mexico, and Turkey, which have made progress in providing access to assistive technologies but face challenges due to resource constraints. Their core objective is to enhance access to assistive technologies, especially in regions where resources are limited. They recognize the importance of striking a balance between technology adoption and affordability. To achieve this goal, this bloc places a strong emphasis on facilitating knowledge transfer and capacity-building initiatives. By empowering local industries to manufacture cost-effective assistive devices, they aim to reduce dependence on imports. Additionally, they advocate for fostering technology partnerships between developed

and developing nations, enabling the diffusion of technology expertise and resources. These countries also champion policy advocacy to integrate assistive technology into healthcare and education systems, promoting a more inclusive society.

Countries with High Assistive Technology Access

Countries that have low barriers to assistive technology access do not have many issues regarding the allocation of assistive healthcare, meaning that they are in a good position to assist in other areas that are not as stable. Additionally, countries that do have a higher score on the GHI Index can act as model countries for others. This is especially important if they were able to improve their situation over time, rather than having geographical or political fortunes where healthcare is prioritized in legislative government or the geographical makeup of the country makes it easy to transport healthcare to all residents.

Consisting of economically developed nations such as the United States, Germany, Japan, Canada, and Sweden, this bloc boasts advanced access to assistive technologies. These countries have made significant strides in ensuring that persons with disabilities have access to cutting-edge assistive devices and technologies. Their primary objective is to advocate for equitable access to assistive technologies on a global scale. To achieve this, they propose the establishment of a comprehensive global assistive technology fund aimed at supporting developing nations. Additionally, they emphasize knowledge sharing and collaborative research initiatives to foster innovation in assistive technologies. Furthermore, they intend to create partnerships between governments, the private sector, and non-governmental organizations (NGOs) to expedite the production and dissemination of assistive devices, thus promoting inclusivity and equal opportunities for persons with disabilities worldwide.

Committee Mission

In the World Health Organization's Report on Disability from 2011, it is estimated that 720 million people worldwide live with a disability that interferes with their daily lives.[97] Estimates also show that a disproportionately high share of the disabled population resides in underdeveloped areas. To ensure that everyone has access to AT, the World Health Organization (WHO) created a priority assistive product list in 2016 and determined that the items on the list are fundamental human rights.[98] Along with WHO, the World Health Assembly (WHA) hoped that this would increase access to AT. Accessing AT is difficult in developing countries, particularly in rural areas with significant institutional gaps. In 2014, the Global Cooperation on Assistive Technology (GATE) program was put in place to increase global access to high-quality, affordable assistive products.[99] This program was developed in partnership with international organizations, donor organizations, professional organizations, academic institutions, and user groups connected to WHA, which in turn helped it with its reach. In 2016, GATE unveiled the Priority Assistive Goods list. The term "priority products" refers to goods that are "highly needed, an absolute necessity to maintain or improve an individual's functioning and which need to be available at a price the community/state can afford."[100] With this list, countries gain an explicit understanding of what will be provided to those who need AT. It also allows patients with disabilities to learn about resources available to them, therefore increasing AT usage and impact. Overall, WHA has been involved in various methods to increase accessibility to AT, as well as mitigating any potential barriers that may prevent that.

Inadequate access to assistive technology has a negative influence on people's ability to learn, earn a living, stay healthy, and be happy. This affects families, communities, and every

97 "World Report on Disability", (Geneva: World Health Organization, 2011), https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability.
98 "Assistive Product List," *World Health Organization*, 2023, https://www.who.int/teams/health-product-policy-and-standards/assistive-and-medical-technology/assistive-technology/promoting-access.
99 "Global report on assistive technology". *World Health Organization,*
100 "Glossary," World Health Organization MeDevIS, accessed August 26, 2023, https://medevis.who-healthtechnologies.org/glossary.

aspect of society. In response, a resolution on expanding access to assistive technology (WHA71.8) was approved by the World Health Assembly in 2018.[101] In this resolution, Member States urged the WHO Director-General to create an international report on efficient access to assistive technology within the framework of an integrated strategy.[102] The Global Report on Assistive Technology, which was created together with stakeholders from many nations and different contexts, contains the most recent information, scientific evidence, and global experiences. It offers ten recommendations that are meant to help countries and other stakeholders in their efforts to advance universal coverage and gradually increase access to assistive technology. Some of these recommendations include growing the healthcare workforce, involving family members and loved ones in the usage of assistive technology, and highlighting the importance of safety when correctly using assistive technology. The provision of assistive technology must be integrated into all-important development sectors, particularly in the fields of health, education, labor, and social care. To increase access to assistive technology for everyone, everywhere, without any financial burden, every nation needs to establish an integrated or standalone assistive technology strategy and plan of action with enough budgetary support. Children with disabilities, adults with multiple or severe impairments, older people, and other vulnerable populations should all receive particular attention as necessary.

101 World Health Association, *Progress Indicators for Access to Assistive Technology,* (World Health Organization, May 9, 2022), https://www.who.int/publications/i/item/WHO-MHP-HPS-ATM-2022.01.
102 "Global report on assistive technology". *World Health Organization.*

Research and Preparation Questions

Your dais has prepared the following research and preparation questions as a means of providing guidance for your research process. These questions should be carefully considered, as they embody some of the main critical thought and learning objectives surrounding your topic.

Topic A

1. How are the working conditions for healthcare workers in your country? What are the biggest challenges they face, and how has your government responded and addressed those issues? How transferable are those solutions to an international stage?
2. How can the international community come together for equitable distribution of critical healthcare supplies? How and from whom should supplies be distributed? Is there any way to support healthcare systems during shortages?
3. Does your country have a large problem with healthcare worker migration? How does this migration affect your country's healthcare system?
4. What are the major reasons workers decide to leave a country, and what can the WHA do to address them?
5. How can nations with more developed healthcare networks support underdeveloped nations? What programs could be implemented that develop healthcare professionals in underdeveloped countries?
6. What impacts the regional variation in access to healthcare in your nation? How can the WHA implement policies to better healthcare access in underserved communities?
7. Does your country have diverse representation in your healthcare system? How has that impacted the efficiency of healthcare? What can the WHA do to promote more diversity in healthcare across the globe?

Topic B

1. Within your country what does access to assistive technology look like? Is the distribution of assistive technology equal, or is there a lack of it in underprivileged communities?
2. Does the infrastructure in your country encourage the development of assistive technology? What institutions does your country have in place to encourage the use of this technology (including medical care, NGO's, etc.)?
3. Is the assistive technology provided in your country of good quality and up to international standards? What can be done to advance the quality of assistive technology in your country?
4. Should the lack of assistive technology in underprivileged communities be considered a human rights issue? What are the implications of this label in your country?
5. What types of assistive technology are most needed within your country? How can the international community come together to help your country provide for its citizens?
6. In the case of diagnosing and aiding patients, how does the educational system within your country equip healthcare professionals to work with assistive technology?

Important Documents

Topic A

World Health Organization. "WHO health workforce support and safeguards list 2023." Publications. March 8, 2023. https://www.who.int/publications/i/item/9789240069787

World Health Organization. *Delivered by women, led by men: a gender and equity analysis of the global health and social workforce*. Geneva: World Health Organization, 2019. https://apps.who.int/iris/bitstream/handle/10665/311322/9789241515467-eng.pdf.

World Health Organization. "Global Code of Practice on the International Recruitment of Health Personnel: Fourth round of reporting." *News release*. June 2, 2022. https://www.who.int/news/item/02-06-2022-who-global-code-of-practice-on-the-international-recruitment-of-health-personnel--fourth-round-of-reporting

World Health Organization. "World Health Statistics 2023." May 19, 2023. https://www.who.int/publications/i/item/9789240074323

World Health Organization. "Global Health Workforce statistics database". *World Health Statistics*. Accessed September 11, 2023. https://www.who.int/data/gho/data/themes/topics/health-workforce

Topic B

"Global report on assistive technology." Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2022. https://www.who.int/publications/i/item/9789240049451.

"Priority Assistive Products List." *World Health Organization: the GATE Initiative*, 2016. https://www.who.int/publications/i/item/priority-assistive-products-list.

"World Report on Disability". *World Health Organization,* 2011. https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability.

Botelho, Fernando. "Childhood and Assistive Technology: Growing with Opportunity, Developing with Technology." *Assistive Technology* 33, no. 51 (2021): S87-S93. https://doi.org/10.1080/10400435.2021.1971330

Works Cited

Committee History

World Health Organization. "History." Accessed September 23, 2023. https://www.who.int/about/history.

World Health Organization. "World Health Assembly." Accessed September 23, 2023. https://www.who.int/about/governance/world-health-assembly.

World Health Organization. "Basic Documents." Accessed September 23, 2023. https://apps.who.int/gb/bd/pdf_files/BD_49th-en.pdf.

World Health Organization. "Hosted Partnerships." Accessed September 23, 2023. https://www.who.int/about/collaboration/partnerships/hosted-partnerships.

World Health Organization. "Constitution of The World Health Organization." https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-x.pdf?ua=1.

Topic A

UN Sources

International Labour Organization, Labour inspection, gender equity, and non-discrimination in the Arab States: guide book. (Geneva: International Labour Organization, 2014), https://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/publication/wcms_249296.pdf.

International Labour Organization, "Ensuring decent work in the health sector," *News release*, April 1, 2019, https://www.ilo.org/brussels/information-resources/WCMS_694961/lang--en/index.htm.

International Labour Organization, "Migrant Health Workers: Is One Country's Gain Another's Pain?," December 19, 2003, https://doi.org/FTR/03/healthworkers.

International Organization for Migration. "Migration in Uganda". *International Organization for Migration.* [PDF]. 2015. https://publications.iom.int/system/files/pdf/mp_uganda_25feb2015_web.pdf

Mathieu Boniol et al., Gender equity in the health workforce: Analysis of 104 countries. Working paper 1. (Geneva: World Health Organization, 2019), https://apps.who.int/iris/bitstream/handle/10665/311314/WHO-HIS-HWF-Gender-WP1-2019.1-eng.pdf.

Sabban, R. "United Arab Emirates: Migrant Women in the United Arab Emirates". *International Labour Office.* September 3, 2023. https://www.ilo.org/wcmsp5/groups/public/@ed_emp/documents/publication/wcms_117955.pdf

UN Development Programme. "What are the Sustainable Development Goals?"Accessed September 7, 2023. https://www.undp.org/sustainable-development-goals.

UNESCO. "Reimagining our futures together: a new social contract for education". *International Commission on the Futures of Education.* 2021. [PDF]. https://unesdoc.unesco.org/ark:/48223/pf0000379707.locale=en

United Nations, "Women's Leadership in Promoting Global Health and Well-Being." *News release*, May 23, 2020. https://www.un.org/en/un-chronicle/women%E2%80%99s-leadership-promoting-global-health-and-well-being.

United Nations. "Goal 10: reduced inequality within and among countries". *Sustainable Development Goals.* Accessed September 7, 2023. https://www.un.org/sustainabledevelopment/inequality/

United Nations. "Realizing SDGs Goal 10th through Health & Welfare Education for Developing Countries". Department of Economic and Social Affairs. Accessed September 7, 2023. https://sdgs.un.org/partnerships/realizing-sdgs-goal-10th-through-health-welfare-education-developing-countries

UN News, "55 Countries Face a Health Worker Crunch Linked to COVID-19: WHO," March 14, 2023, https://news.un.org/

en/story/2023/03/1134562.

WHO. "Universal health coverage (UHC)". Fact Sheets. June 29, 2023. https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc)

WHO Africa. "Chronic staff shortfalls stifle Africa's health systems: WHO study". *World Health Organization African Region*. June 22, 2022. https://www.afro.who.int/news/chronic-staff-shortfalls-stifle-africas-health-systems-who-study

WHO Global Code of Practice on the International Recruitment of Health Personnel: Fourth round of reporting". *News release*. June 2, 2022. https://www.who.int/news/item/02-06-2022-who-global-code-of-practice-on-the-international-recruitment-of-health-personnel--fourth-round-of-reporting

WHO Regional Office for Africa, "Chronic Staff Shortfalls Stifle Africa's Health Systems: WHO Study," 2022, https://www.afro.who.int/news/chronic-staff-shortfalls-stifle-africas-health-systems-who-study.

World Health Organization, Delivered by women, led by men: a gender and equity analysis of the global health and social workforce. (Geneva: World Health Organization, 2019), https://apps.who.int/iris/bitstream/handle/10665/311322/9789241515467-eng.pdf.

World Health Organization, *Working for Health 2022–2030 Action Plan Adopted by Seventy-Fifth World Health Assembly*, (World Health Organization: WHO, June 2, 2022), https://www.who.int/news/item/02-06-2022-w4h_wha75.

World Health Organization, "Close to One Billion People Globally Are Served by Health-Care Facilities with No Electricity Access or with Unreliable Electricity" *WHO*, January 14, 2023, https://www.who.int/news/item/14-01-2023-close-to-one-billion-people-globally-are-served-by-health-care-facilities-with-no-electricity-access-or-with-unreliable-electricity.

World Health Organization, "Health Workforce," August 7, 2019, https://www.who.int/health-topics/health-workforce#tab=tab_1.

World Health Organization, "Universal Health Coverage (UHC)," (World Health Organization: WHO, June 29, 2023), https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc).

World Health Organization, "WHO health workforce support and safeguards list" (Geneva: World Health Organization, 2023), https://www.who.int/publications/i/item/9789240069787

World Health Organization, "Working Together for Health" (Geneva: WHO Press, 2006), https://apps.who.int/iris/bitstream/handle/10665/43432/9241563176_eng.pdf.

World Health Organization, "World Bank and WHO: Half the World Lacks Access to Essential Health Services, 100 Million Still Pushed into Extreme Poverty because of Health Expenses," December 13, 2017, https://www.who.int/news/item/13-12-2017-world-bank-and-who-half-the-world-lacks-access-to-essential-health-services-100-million-still-pushed-into-extreme-poverty-because-of-health-expenses.

World Health Organization. "Global Health Workforce statistics database". World Health Statistics. Accessed September 11, 2023. https://www.who.int/data/gho/data/themes/topics/health-workforce

World Health Organization. "Imbalances in rural primary care". 2018. [PDF].

World Health Organization. "Increasing access to health workers in remote and rural areas through improved retention". WHO. 2010. [PDF]. https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf

World Health Organization. "Primary Health Care on the rRoad to Universal Health Coverage". 2019. https://apps.who.int/iris/bitstream/handle/10665/328913/WHO-HIS-HGF-19.1-eng.pdf?sequence=1&isAllowed=y

World Health Organization. "Targets of Sustainable Development Goal 3". World Health Organization Europe. Accessed September 7, 2023. https://www.who.int/europe/about-us/our-work/sustainable-development-goals/targets-of-sustainable-development-goal-3

World Health Organization. "The Philippines Health System Review". *Health Systems in Transition*. Vol. 8 (2). 2018. [PDF]. https://apps.who.int/iris/bitstream/handle/10665/274579/9789290226734-eng.pdf

World Health Organization. "WHO, partners seek to reboot Africa's health emergency response". *World Health Organization Africa*. June 2, 2022. https://www.afro.who.int/news/who-partners-seek-reboot-africas-health-emergency-response

World Health Organization. "WHO, partners seek to reboot Africa's health emergency response". *World Health Organization Africa*. June 2, 2022. https://www.afro.who.int/news/who-partners-seek-reboot-africas-health-emergency-response

World Health Organization. "WHO guideline on health workforce development, attraction, recruitment and retention in rural and remote areas". Publications. May 6, 2021. https://www.who.int/publications/i/item/9789240024229

World Health Organization. "WHO health workforce support and safeguards list 2023". Publications. March 8, 2023. https://www.who.int/publications/i/item/9789240069787

World Health Organization. "WHO report shows poorer health outcomes for many vulnerable refugees and migrants". *News*. July 20, 2022. https://www.who.int/news/item/20-07-2022-who-report-shows-poorer-health-outcomes-for-many-vulnerable-refugees-and-migrants

World Health Organization. "Working Together for Health". *World Health Organization.* [PDF]. 2006. https://apps.who.int/iris/handle/10665/43432

World Health Organization. "World Health Statistics 2023". World Health Organization. May 19, 2023. https://www.who.int/publications/i/item/9789240074323

World Health Organization (WHO), "Encouraging Medical Education to Bolster the Global Health Care Workforce," *WHO International,* accessed September 1, 2023, https://www.who.int/activities/encouraging-medical-education-to-bolster-the-global-health-care-workforce.

World Health Organization (WHO), "Health Workforce," *WHO International,* last modified August 7, 2019, https://www.who.int/health-topics/health-workforce#tab=tab_1.

World Health Organization and the International Labour Organization, "The gender pay gap in the health and care sector: a global analysis in the time of COVID-19 "(Geneva: World Health Organization and the International Labour Organization, 2022).

World Health Organization and the International Labour Organization, "The gender pay gap in the health and care sector."

"About WHO," World Health Organization, 2023, https://www.who.int/about.

"Global Health 50/50 Report (2018)." Global Health 5050, accessed July 21, 2023, https://globalhealth5050.org/report/.

"Health workforce: The health workforce crisis," *World Health Organization,* June 24, 2009, https://www.who.int/news-room/questions-and-answers/item/q-a-on-the-health-workforce-crisis.

Non-UN Sources

Africa CDC. "Africa CDC launches Public Health Emergency Management Fellowship for African health professionals". *African Union*. Press Release. March 18, 2023. https://africacdc.org/news-item/africa-cdc-launches-public-health-emergency-management-fellowship-for-african-health-professionals/https://africacdc.org/news-item/africa-cdc-launches-public-health-emergency-management-fellowship-for-african-health-professionals/

Africa CDC. "Africa Health ExCon 2023: Showcasing Africa's potential for investment in manufacturing, pharmaceutical business and innovative health technology". Africa CDC. Press Release. June 9, 2023.

Ahmat, A. et.al. "The health workforce status in the WHO African Region: findings of a cross-sectional study". BMJ Global Health. Vol. 7 (1). 2022. https://gh.bmj.com/content/7/Suppl_1/e008317

Alex Blumberg, "Accidents of History Created U.S. Health System," *NPR*, October 22, 2009, https://www.npr.org/2009/10/22/114045132/accidents-of-history-created-u-s-health-system.

Awan, O. "Healthcare Worker burnout Is Rampant - Here's What Should Be Done". *Forbes*. March 8, 2023. https://www.forbes.com/sites/omerawan/2023/03/08/healthcare-worker-burnout-is-rampantheres-what-should-be-

done/?sh=34c7d73e494c

Ayaz, B. et.al. "Participation of women in the health workforce in the fragile and conflict-affected countries: a scoping review". *Human Resources for Health*. August 4, 2021. https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-021-00635-7

Benishek, L.E. "Mitigating Health-Care Worker Distress From Scarce Medical Resource Allocation During a Public Health Crisis". *Chest*. August 6, 2020. DOI: https://doi.org/10.1016/j.chest.2020.07.073

Bernstein, "How Many Patients Should Your Doctor See Each Day?."

Britannica. "Horn of Africa". Britannica. Updated September 5, 2023. https://www.britannica.com/place/Horn-of-Africa

Caluori, A. "Burnout in healthcare: risk factors and solutions". *Supporting Occupational Health and Wellbeing Professionals*. July 2023. https://www.som.org.uk/new-strategy-needed-tackle-healthcare-burnout-crisis

Campbell, "NHS Hospitals Facing Serious Shortages of Vital Equipment."

CDC, "Work Stress," *CDC*, last modified November 6, 2018, https://www.cdc.gov/niosh/topics/healthcare/workstress.html.

Christoph Aluttis, Tewabech Bishaw, and Martina W. Frank, "The Workforce for Health in a Globalized Context – Global Shortages and International Migration," *Global Health Action* 7, no. 1 (February 13, 2014): 23611, https://doi.org/10.3402/gha.v7.23611.

Claudia Goldin and Lawrence F. Katz, "The Cost of Workplace Flexibility for High-Powered Professionals," The ANNALS of the American Academy of Political and Social Science 638, no.1 (November 2011): https://scholar.harvard.edu/sites/scholar.harvard.edu/files/goldin/files/the_cost_of_workplace_flexibility_for_high-powered_professionals.pdf.

Constance J Newman, Linda Fogarty, Lucia Nthabiseng Makoae, and Erik Reavely, "Occupational segregation, gender essentialism and male primacy as major barriers to equity in HIV/AIDS caregiving: findings from Lesotho," *International Journal for Equity in Health* 10, no. 1 (June 2011): 24. https://doi.org/10.1186/1475-9276-10-24.

Cosby, A.G. "Growth and Persistence of Place-Based Mortality in the United States: The Rural Mortality Penalty". *Am J Public Health*. January 2019. 109(1). https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2018.304787

Cullinan, K. "Universal Health Coverage: Only Half of Africans Have Access to Health Care". Universal Health Coverage. August 3, 2021. https://healthpolicy-watch.news/only-half-of-africans-have-access-to-health-care/

Denis Campbell, "NHS Hospitals Facing Serious Shortages of Vital Equipment," *The Guardian*, January 25, 2018, https://www.theguardian.com/society/2018/jan/25/nhs-hospitals-serious-shortages-vital-equipment.

Donika Limani, "Nurses and Midwives: Overworked, Underpaid, Undervalued? - ILOSTAT," ILOSTAT, May 12, 2023, https://ilostat.ilo.org/nurses-and-midwives-overworked-underpaid-undervalued/.

Facilities with No Electricity Access or with Unreliable Electricity".

Gemma Doleman, Annemarie De Leo, and Dianne Bloxsome, "The Impact of Pandemics on Healthcare Providers' Workloads: A Scoping Review," *Journal of Advanced Nursing*, (May 2023): 2, https://doi.org/10.1111/jan.15690.

Gessert, C. et.al. "Rural definition of health: a systematic literature review". *BMC Public Health*. 2015. https://bmcpublichealth.biomedcentral.com/counter/pdf/10.1186/s12889-015-1658-9.pdf

Gita Sen and Piroska Östin, "Gender inequity in health: why it exists and how we can change it," Global Public Health 3, no. 1 (April 2008): 1-24. https://doi.org/10.1080/17441690801900795.

Gretchen Berlin et al., "Assessing the Lingering Impact of COVID-19 on the Nursing Workforce," *McKinsey & Company* (McKinsey & Company, May 11, 2022), https://www.mckinsey.com/industries/healthcare/our-insights/assessing-the-lingering-impact-of-covid-19-on-the-nursing-workforce.

Gülin Özdamar Ünal, Gökçe Iscan and Onur Ünal, "The occurrence and consequences of violence against healthcare workers in Turkey: before and during the COVID-19 pandemic," *Family Practice* 39, no. 6 (November 2022), 1001-1008, https://doi.org/10.1093/fampra/cmac024.

H. Markel, "Worldly Approaches to Global Health: 1851 to the Present," *Public Health* 128, no. 2 (February 2014): 124–28, https://doi.org/10.1016/j.puhe.2013.08.004.

Hegewisch, A., Hartmann, H. "Occupational Segregation and the Gender Wage Gap: A Job Half Done". *Institute for Women's Policy Research*. January 2014. https://iwpr.org/wp-content/uploads/2020/08/C419.pdf

Hegewisch, Ariane, and Heidi Hartmann, Occupational Segregation and the Gender Wage Gap: A Job Half Done. (Institute for Women's Policy Research, 2014). https://iwpr.org/wp-content/uploads/2020/08/C419.pdf.

Izdebski, Z. et.al. "Occupational Burnout in Healthcare Workers, Stress and Other Symptoms of Work Overload during the COVID-19 Pandemic in Poland". *Int J Environ Res Public Health*. February 2023. Vol. 20(3). DOI: https://doi.org/10.3390/ijerph20032428

Jaeger, Fabienne N., Bechir, Mahamat., Harouna, Moumini., Moto Daugla D., and Utzinger, J. "Challenges and opportunities for healthcare workers in a rural district of Chad". *BMC Health Services Research*. Vol. 18. January 8, 2018. https://doi.org/10.1186/s12913-017-2799-6

Justin Barr and Scott H Podolsky, "A National Medical Response to Crisis — the Legacy of World War II," *The New England Journal of Medicine* 383, no. 7 (August 13, 2020): 613–15, https://doi.org/10.1056/nejmp2008512.

Kwame, A., Petrucka, P.M. "A literature-based study of patient-centered care and communication in nurse-patient interactions: barriers, facilitators and the way forward". *BMC Nursing*. September 3, 2021. https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-021-00684-2

Labonté, R.et.al. "Health worker migration from South Africa: causes, consequences and policy responses". *Human Resources for Health*. December 3, 2015. https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-015-0093-4

Laura Woodman, "Healthcare Worker, Everything You Need to Know about It," *Caring Support*, (February 2023), https://www.caringsupport.com/blog/healthcare-worker-everything-you-need-to-know-about-it

Lenny Bernstein, "How Many Patients Should Your Doctor See Each Day?," *Washington Post*, May 22, 2014, https://www.washingtonpost.com/news/to-your-health/wp/2014/05/22/how-many-patients-should-your-doctor-see-each-day/.

lina Verashchagina and Francesca Bettio, Gender segregation in the labour market: root causes, implications and policy responses in the EU. (Luxembourg: Publications Office of the European Union, 2009). https://op.europa.eu/en/publication-detail/-/publication/39e67b83-852f-4f1e-b6a0-a8fbb599b256.

Linsey M. Barker and Maury A. Nussbaum, "Fatigue, Performance and the Work Environment: A Survey of Registered Nurses," *Journal of Advanced Nursing* 67, no. 6 (February, 2011): 1170–1406, https://doi.org/10.1111/j.1365-2648.2010.05597.x.

Manyisa and van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," 28-38.

Masebeo Koto and Pranitha Maharaj, "Difficulties Facing Healthcare Workers in the Era of AIDS Treatment in Lesotho," *SAHARA-J* 13, no. 1 (January 1, 2016): 53–59, https://doi.org/10.1080/17290376.2016.1179588.

Mathieu Boniol et al., "The Global Health Workforce Stock and Distribution in 2020 and 2030: A Threat to Equity and 'Universal' Health Coverage?," *BMJ Global Health* 7, no. 6 (June 1, 2022): e009316–16, https://doi.org/10.1136/bmjgh-2022-009316.

Matt McNeill, "Extraordinary Impacts on the Healthcare Workforce":, *Delaware Journal of Public Health* 8, no. 5 (December 1, 2022): 164–67, https://doi.org/10.32481/djph.2022.12.038.

McGrail, Matthew R. and O'Sullivan, Belinda G. "Increasing doctors working in specific rural regions through selection from and training in the same region: national evidence from Australia". *Human Resources Health*. Vol. 19. October 29, 2021. https://doi.org/10.1186/s12960-021-00678-w

McPake, B. et.al. "What steps can improve and promote investment in the health and care workforce?" *Health Systems and Policy Analysis. World Health Organization*. 2023. [PDF]

Megha Kaveri, "WHO Raises Alarm over Increased Healthcare Worker Migration to Rich Countries Post Pandemic," *Health Policy Watch,* March 14, 2023, https://healthpolicy-watch.news/eight-country-healthcare-workers-migration/.

Newman, C.J. et.al. "Occupational segregation, gender essentialism and male primacy as major barriers to equity in HIV/AIDS caregiving: Findings from Lesotho". https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_457317.pdf

Nobuyuki Tanaka and Koji Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help," *World Bank,* last modified October 27, 2022, https://blogs.worldbank.org/education/world-needs-more-and-better-nurses-heres-how-education-sector-can-help#.

Okoroafor, SC. et.al. "Preparing the health workforce for future public health emergencies in Africa". *BMJ Global Health*. February 2022. http://dx.doi.org/10.1136/bmjgh-2021-008327

Ontario. Growth Plan for Northern Ohio. September 3, 2023. https://www.ontario.ca/document/growth-plan-northern-ontario/people

Organization for Economic Co-operation and Development, *Policy Brief: International Migration of Health Workers*, (Paris: OECD, 2010), https://www.oecd.org/els/health-systems/44783473.pdf.

Organization for Economic Co-operation and Development. "Policy Brief: International Migration of Health Workers". Paris: *OECD*, 2010. https://www.oecd.org/els/health-systems/44783473.pdf.

Poppe, A. et.al. "Why sub-Saharan African health workers migrate to European countries that do not actively recruit: a qualitative study post-migration". *Global Health Action*. May 2014. https://doi.org/10.3402/gha.v7.24071

ReliefWeb, "Working for Health 2022-2030 Action Plan - World."

Richman, L. "Addressing health inequalities in diverse, rural communities: An unmet need". *SSM Popul Health*. April 7, 2019. https://doi.org/10.1016/j.ssmph.2019.100398

Rosalind Steege et al., "How do gender relations affect the working lives of close to community health service providers? Empirical research, a review and conceptual framework," *Social Science & Medicine* 209, (July 2018), 10.1016/j.socscimed.2018.05.002.

Rural health Info. "Healthcare Access in Rural Communities". *RHIhub*. Reviewed November 21, 2022. https://www.ruralhealthinfo.org/topics/healthcare-access

Sabban, R. "United Arab Emirates: Migrant Women in the United Arab Emirates".

Safi, N. et.al. "Addressing health workforce shortages and maldistribution in Afghanistan". *World Health Organization*. Vol. 24(9). 2018. https://applications.emro.who.int/emhj/v24/09/EMHJ_2018_24_09_951_958.pdf?ua=1

Safi, N. et.al. "Addressing health workforce shortages and maldistribution in Afghanistan". *World Health Organization*. Vol. 24(9). 2018. https://applications.emro.who.int/emhj/v24/09/EMHJ_2018_24_09_951_958.pdf?ua=1

Sapkota Bhim Prasad and Khil Prasad Bhusal, "Work place sexual harassment among female health workers in grass-root level health institutions in Nepal," *Occupational Medicine and Health Affairs* 3, no. 4 (August 2015): https://www.omicsonline.org/2329-6879/2329-6879.S1.022_022.pdf.

Saraladevi Naicker, "Shortage of Healthcare Workers in Developing Countries--Africa," *Ethnicity & Disease* 19, no. 1 Suppl 1 (2023), https://pubmed.ncbi.nlm.nih.gov/19484878/.

Shelley J. Correll, "Redesigning, Redefining Work," *Work and Occupations* 41, no. 1 (February 2014): https://doi.org/10.1177/0730888413515250.

Shipman, S.A. "The Decline In Rural Medical Students: A Growing Gap In Geographic Diversity Threatens The Rural Physician Workforce". December 2019. https://doi.org/10.1377/hlthaff.2019

Siyam,A. Dal Poz, M.R. "Migration of Health Workers". World Health Organization.

Sophie Witter et al., "The gendered health workforce: mixed methods analysis from four fragile and post-conflict contexts," *Health Policy and Planning* 32, no. 5 (December 2017), https://doi.org/10.1093/heapol/czx102.

Steinhauser, Jost., Joos, Stephanie., Szecsenyi, Joachim., Miksch, Antje. "A comparison of the workload of rural and urban

primary care physicians in Germany: analysis of a questionnaire survey". *BMC Family Practice*. Vol. 12. October 11, 2011. https://doi.org/10.1186/1471-2296-12-112

Stephen Bach, "SECTORAL ACTIVITIES PROGRAMME Working Paper International Migration of Health Workers: Labour and Social Issues," 2003, https://www.aspeninstitute.org/wp-content/uploads/files/content/images/Bach%20Health%20worker%20Migration%20WP.pdf.

Stewart, Derek., Gibson-Smith, Kathrine., Cunningham, Scott., Pfleger, Sharon., Rushworth, Gordon. "A qualitative study of the perspectives of older people in remote Scotland on accessibility to healthcare, medicines and medicines-taking". *Int J Clin Pharm*. Vol. 40. October 2018. https://doi.org/10.1007%2Fs11096-018-0684-y

Stoumpos, A.I. et.al. "Digital Transformation in Healthcare: Technology Acceptance and Its Applications". *Int J Environ Res Public Health*. February 2023. Vol. 20 (4). DOI: https://doi.org/10.3390/ijerph20043407

Strasser, RP. et.al. "Canada's new medical school: The Northern Ontario School of Medicine: social accountability through distributed community engaged learning". *Acad Med*. October 2009. doi: 10.1097/ACM.0b013e3181b6c5d7.

Sue Ellen Carroll, "The Causes & Effects of Staff Shortages in Healthcare," AArete, last modified May 24, 2023, https://www.aarete.com/insights/the-causes-and-effects-of-staff-shortages-in-healthcare/.

Tadibonia, S.N. "The importance and leverage of modern information technology infrastructure in the healthcare industry". *New York Institute of Technology*. December 2022. Doi: https://dx.doi.org/10.6084/m9.doione.IJRTI2212044

Tanaka and Miyamoto, "The World Needs More and Better Nurses. Here's How the Education Sector Can Help."; https://openknowledge.worldbank.org/entities/publication/77a74b0e-7030-5e69-bd90-49a94f244671

Tiago Santana, "Access to Education: The Impact of Inequality on Education," *Graygroupintl.com* (Gray Group International LLC, March 14, 2023), https://www.graygroupintl.com/blog/impact-of-inequality-on-education-access-and-quality.

Tomblin Murphy, G. "The WHO global code of practice: early evidence of its relevance and effectiveness". *Human Resources for Health*. Vol. 14 (36). June 30, 2016. https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-016-0125-8

Tulane University. "How to Improve Health Care in Rural Areas". January 17, 2023. https://publichealth.tulane.edu/blog/how-to-improve-health-care-in-rural-areas/

University of Pennsylvania. "Where Did All the Nurses Go?". *Penn Nursing*. Accessed September 10, 2023. https://www.nursing.upenn.edu/nhhc/workforce-issues/where-did-all-the-nurses-go/

Verashchagina and Bettio, *Gender segregation in the labour market: root causes, implications and policy responses in the EU.*

Victoria Bailey, "COVID-19 Pandemic Exacerbated Healthcare Workforce Challenges," *RevCycleIntelligence*, May 5, 2022, https://revcycleintelligence.com/news/covid-19-pandemic-exacerbated-healthcare-workforce-challenges.

WHF. "The Road to UHC: Why Integration of Circulatory Health Interventions in Primary Care is Essential". *World Heart Federation*. June 21, 2023. https://www.world-stroke.org/assets/downloads/The-Road-to-UHC_1.pdf

Women in Global Health, "Annual count of women Chief Delegates." News release, May 23, 2023. https://womeningh.org/wha76-gender-count/.

Zhang et al., "Workplace violence against healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis," *Environmental Science and Pollution Research International* 30, no. 30 (May 2023), https://doi.org/10.1007/s11356-023-27317-2.

Zodwa M. Manyisa and Elsie J. van Aswegen, "Factors Affecting Working Conditions in Public Hospitals: A Literature Review," *International Journal of Africa Nursing Sciences* 6, (February 2017): 28–38, https://doi.org/10.1016/j.ijans.2017.02.002.

Zurn, P. et.al. "The importance of strengthening the health workforce in Nigeria to improve health outcomes". *Journal of Public Health*. March 2021. https://doi.org/10.1093/pubmed/fdab012

"How Student Loans Affect Healthcare Professionals," *Marvel Medical Staffing,* accessed September 1, 2023, https://

marvelmedstaff.com/how-student-loans-affect-healthcare-professionals/.

"Human: Solving the Global Workforce Crisis in Healthcare," *KPMG*, February 22, 2023, https://kpmg.com/xx/en/home/insights/2019/03/human-solving-the-global-workforce-crisis-in-healthcare.html.

"Top and Bottom Countries in Women's Workplace Equality," *Women's Workplace Equality Index*, accessed July 22, 2023, https://www.cfr.org/legal-barriers/country-rankings/.

"Working for Health 2022-2030 Action Plan - World," ReliefWeb, February 4, 2023, https://reliefweb.int/report/world/working-health-2022-2030-action-plan

Topic B

UN Sources

"A manual for public procurement of assistive products, accessories, spare parts and related services". *World Health Organization and the United Nations Children's Fund,* 2020. https://iris.who.int/bitstream/handle/10665/341892/9789240013988-eng.pdf?sequence=1

"Assistive Product List," *World Health Organization*, 2023, https://www.who.int/teams/health-product-policy-and-standards/assistive-and-medical-technology/assistive-technology/promoting-access.

"Assistive Technology," World Health Organization, Newsroom, Accessed July 30, 2023, https://www.who.int/news-room/fact-sheets/detail/assistive-technology.

"Assistive technology: a 'life changer' for those most in need". *United Nations. UN News.* May 16, 2022. https://news.un.org/en/story/2022/05/1118212

"Convention on the Rights of Persons with Disabilities," OHCHR, 2023, https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities.

"Fact Sheet on Wheelchairs." *World Health Organization.* 2010. https://apps.who.int/iris/bitstream/handle/10665/205041/B4616.pdf?seq

Fanara Bunyadzada, "WHO Continues Work for Supporting Rehabilitation and Assistive Technology Services in Azerbaijan," *United Nations Azerbaijan*, 2022, https://azerbaijan.un.org/en/204776-who-continues-work-supporting-rehabilitation-and-assistive-technology-services-azerbaijan

"Global report on assistive technology" (Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2022), https://www.who.int/publications/i/item/9789240049451.

"Health - United Nations Sustainable Development," *United Nations.* September 7, 2023, https://www.un.org/sustainabledevelopment/health/

"Opportunities for Education, Inclusion and Participation". United Nations Children's Fund and the World Health Organization. 2015. https://www.unicef.org/media/126246/file/Assistive-Tech-Web.pdf

"Prevalence of coverage of assistive technology in the WHO European Region: A scoping review", *World Health Organization Regional Office for Europe*, 2021, https://apps.who.int/iris/bitstream/handle/10665/344520/WHO-EURO-2021-3173-42931-59954-eng.pdf?sequence=1&isAllowed=y

"Priority Assistive Products List". *World Health Organization. USAID, The GATE Initiative.* January 2016. https://iris.who.int/bitstream/handle/10665/207694/WHO_EMP_PHI_2016.01_eng.pdf?sequence=1

"Progress Indicators for Access to Assistive Technology," *World Health Association,* (World Health Organization, May 9, 2022), https://www.who.int/publications/i/item/WHO-MHP-HPS-ATM-2022.01.

Resolution EM/RC63/9-E, Report of the 63rd session of the WHO Regional Committee for the Eastern Mediterranean, Dec 2016, https://applications.emro.who.int/docs/RC_final_Rep_2016_19339_EN.pdf?ua=1

"Standard Rules on the Equalization of Opportunities for Persons with Disabilities". *Office of the United Nations High Commissioner*

for Human Rights. (New York: United Nations General Assembly, 1993), https://www.ohchr.org/en/instruments-mechanisms/instruments/standard-rules-equalization-opportunities-persons-disabilities

"Summary report on the regional consultation on the WHO-UNICEF global report on assistive technology (GREAT)", *World Health Organization Regional Office for the Eastern Mediterranean,* (Cairo: World Health Organization 2022), License: CC BY-NC-SA 3.0 IGO, https://apps.who.int/iris/bitstream/handle/10665/361349/WHOEMHLP131E-eng.pdf?sequence=1

Tangcharoensathien V et al., "Improving access to assistive technologies: challenges and solutions in low- and middle-income countries," *World Health Organization South-East Asia J Public Health*, (2018), 84–89, https:// doi:10.4103/2224-3151.239419.

"UNDP launches Assistive Technology Incubation Programme to support PWDs in Egypt". *United Nations Development Programme.* April 26, 2021. https://www.undp.org/arab-states/press-releases/undp-launches-assistive-technology-incubation-programme-support-pwds-egypt

"UN Human Rights Council, General Comment No. 6, Equality and nondiscrimination, CRPD/C/GC/6, ¶ 1 (April 26, 2018), https://www.ohchr.org/en/documents/general-comments-and-recommendations/general-comment-no6-equality-and-non-discrimination.

"UNICEF and WHO Launch the First Global Report on Assistive Technology." *United Nations Children's Fund,* 2022, https://www.unicef-irc.org/article/2275-unicef-and-who-launch-the-first-global-report-on-assistive-technology.html

"United Nations Convention on the Rights of Persons with Disabilities (CRPD)," United Nations, Accessed July 31, 2023

"WHO Helps Tajikistan to Strengthen Rehabilitation Services and Assistive Technology," *World Health Organization*, February 17, 2023, https://www.who.int/europe/news/item/17-02-2023-who-helps-tajikistan-to-strengthen-rehabilitation-services-and-assistive-technology-.

"WHO in Islamic Republic of Iran". *World Health Organization Eastern Mediterranean Region.* August 21, 2022. https://www.emro.who.int/iran/news/who-eu-and-canada-project-to-improve-access-to-inclusive-health-care-for-older-persons-and-people-living-with-disabilities-gets-one-step-closer-to-results.html

"World Population Prospects 2022: Summary of Results," *United Nations,* 2022, https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022_summary_of_results.pdf

"World Report on Disability", (Geneva: World Health Organization, 2011), https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability.

"World Report on Hearing". (Geneva: World Health Organization, 2021), https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/highlighting-priorities-for-ear-and-hearing-care

"World Report on Vision". (Geneva: World Health Organization, 2019), https://www.who.int/publications/i/item/9789241516570

Non-UN Sources

Alarcos Cieza. "Global Estimates of the Need for Rehabilitation Based on the Global Burden of Disease Study 2019: A Systematic Analysis for the Global Burden of Disease Study 2019," *The Lancet 396*, no. 10267, 2020, https://doi.org/10.1016/S0140-6736(20)32340-0

Alexandre Cote, "Social Protection and Access to Assistive Technology in Low- and Middle-income Countries," *The Official Journal of RESNA 33*, no. 1, 2021, https://doi.org/10.1080/10400435.2021.1994052

Amal Harrati, Sarah Bardin, and David R Mann, "Spatial Distributions in Disaster Risk Vulnerability for People with Disabilities in the U.S.," *International Journal of Disaster Risk Reduction* 87 (March 1, 2023): 103571–71, https://doi.org/10.1016/j.ijdrr.2023.103571.

André T. Sugawara et al., "Abandonment of assistive products: assessing abandonment levels and factors that impact on it," *Disability and Rehabilitation: Assistive Technology*, 13:7, 716-723, 10.1080/17483107.2018.1425748

Anne Chamberlain and Alan Tennant. "Supporting Rehabilitation in Developing Countries," *Journal of Rehabilitation Medicine 47*, no. 5, 2015, https://doi.org/10.2340/16501977-2005

Arne H. Eide, "Measuring Self-Reported Access to Assistive Technology Using the WHO Rapid Assistive Technology

Assessment (RATA) Questionnaire: Protocol for a Multi-Country Study." *National Library of Medicine*, 2017, https://doi.org/10.3390/ijerph182413336

Botelho, Fernando. "Childhood and Assistive Technology: Growing with Opportunity, Developing with Technology." Assistive Technology 33, no. 51 (2021): S87-S93. https://doi.org/10.1080/10400435.2021.1971330

Brigitte Rohwerder, *Assistive technologies in developing countries* (Brighton, UK: K4D Helpdesk Report, 2018), https://assets.publishing.service.gov.uk/media/5af976ab40f0b622d4e9810f/Assistive_technologies_in_developing-countries.pdf.

Chapal Khasnabis, Zafar Mirza, and Malcolm MacLachlan, "Opening the GATE to Inclusion for People with Disabilities." *The Lancet*, 2012, https://doi.org/10.1016/S0140-6736(15)01093-4

Chris Stokel-Walker, "Sustainable Development Goals: What are they and are we on track?" *Neste*, March 10, 2023, https://journeytozerostories.neste.com/sustainable-development-goals?utm_campaign=awareness_sem-us-california-brand-sustainability_corporate_neste_neste_always-on-advertising_usa-california---ca_b2b_new-customers_sus_2023_q2&utm_source=google&utm_medium=search_paid&gclid=CjwKCAjw29ymBhAKEiwAHJbJ8m6GrlTxIgOZFFLNUKdTWdSa2b-oSuJK_ua3hixv0BW6QwoUPM2qIhoC41wQAvD_BwE#

Clive Gilbert, "The challenge of making assistive technology affordable is becoming more urgent" *LinkedIn*, 2023, https://www.linkedin.com/pulse/challenge-making-assistive-technology-affordable-becoming-gilbert/.

Emma M. Smith, "Relevance of Assistive Technology and the Sustainable Development Goals to Stakeholder Organizations in Malawi," *Global Health Action*, 2022, https://doi.org/10.1080/16549716.2022.2133381

Emma Smith, "The Global Report on Assistive Technology: a new era in assistive technology," *Assistive Technology*, 34:3, June 2022, 255-255, https://doi.org/10.1080/10400435.2022.2077596.

Faheem Hussain and Suzana Brown, "The Role of ICTs for Evaluating Access and Mobility of Refugees Using Assistive Devices: Case Study of Rohingya Camps in Cox's Bazar," *Association for Information Systems*, 2022, https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1008&context=globdev2022

Fernando Botelho,. "Childhood and Assistive Technology: Growing with Opportunity, Developing with Technology," *Assistive Technology 33*, no. 51, 2021, https://doi.org/10.1080/10400435.2021.1971330

Gavin Wood and Golnaz Whittaker, *Assistive Technology in Humanitarian Settings*, (Italy: UNICEF, 2022), https://files.eric.ed.gov/fulltext/ED620397.pdf.

IA-CEPA ECP. "Limited access to assistive technology costs the economy up to 7% annually". - Press Release. *KATALIS*. September 26, 2023. https://iacepa-katalis.org/limited-access-to-assistive-technology-costs-the-economy-up-to-7-annually/

Jamali-Phiri, M, E.M Smith, and J.A. Kafumba. "Socio-Demographic Factors Influencing the Use of Assistive Technology among Children with Disabilities in Malawi." https://doi.org/10.3390/ijerph18063062

Johan Borg et al., "Assistive Technology Use Is Associated with Reduced Capability Poverty: A Cross-Sectional Study in Bangladesh, "*Disability and Rehabilitation: Assistive Technology* 7, no.2, March 2012,: 112-121, https://doi.org/10.3109/17483107.2011.602173.

Jonathan, Howard, Zoe Fisher, Andrew H. Kemp, Stephen Lindsay, Lorna H. Tasker & Jeremy J. Tree. "Exploring the barriers to using assistive technology for individuals with chronic conditions: a meta-synthesis review". *Disability and Rehabilitation: Assistive Technology*. 14 no.4. July 14, 2020: 390-408. https://doi.org/10.1080/17483107.2020.1788181

Julie Abimanyi-Ochom and Hasheem Mannan, "Uganda's Disability Journey: Progress and Challenges," *African journal of disability*, (November 25, 2014), https://doi.org/10.4102/ajod.v3i1.108.

Lucas Downey. "Buying Power (Excess Equity): Definition in Trading and Example," *Investopedia*, August 23, 2021. https://www.investopedia.com/terms/b/buyingpower.asp

Malcolm MacLachlan, "Assistive Technology Policy: A Position Paper from the First Global Research, Innovation, and Education on Assistive Technology (GREAT) Summi." *Journal of Rehabilitation Medicine* 13, no. 5, 2018, https://doi.org/10.1080/17483107.2018.1468496.

Malika Makhkambaeva, "Disability and Rehabilitation Project," *USAID*, 2022, https://2017-2020.usaid.gov/tajikistan/fact-sheets/disability-and-rehabilitation-project

Marco Tofani et al. "Disability, Rehabilitation, and Assistive Technologies for Refugees and Asylum Seekers in Italy: Policies and Challenges." *Societies 13*, no. 3, 2020, https://doi.org/10.3390/soc13030063

Margaret Savage et al. "Digital Assistive Technology. A Market Landscape and Strategic Approach to Increasing Access to Digital Assistive Technology in Low- and Middle-income Countries." *Product Narrative*, 2020. https://www.at2030.org/product-narrative:-digital-assistive-technology/

Marianne K. Dove, *Advancements in Assistive Technology and assistive technology Laws for the Disabled*, 2012, (DKG: Delta Kappa Gamma, 2012), http://www.deltakappagamma.org/NH/Summer%202012%20-%20Educational%20Technology-web.pdf

Michael Zhu Chen et al. "Demographic and Environmental Factors Associated with Disability in India, Laos, and Tajikistan: A Population-based Cross-sectional Study," *BMC Public Health*, 2021, https://doi.org/10.1186/s12889-022-12846-1

Monica Jamali-Phiri et al., "Socio-Demographic Factors Influencing the Use of Assistive Technology among Children with Disabilities in Malawi," *International Journal of Environmental Research and Public Health 18*, no. 6 (2021). Accessed July 4, 2023, https://doi.org/10.3390/ijerph18063062.

"Our Mission," *Polio Global Eradication Initiative*, accessed August 26, 2023, https://polioeradication.org/who-we-are/our-mission/#

Raymond Lang et al., "Implementing the United Nations Convention on the Rights of Persons with Disabilities: Implications, Practice and Limitations," *Alter* 5, no. 3, 2011, 206-220, https://doi.org/10.1016/j.alter.2011.02.004.

Rohwerder, Brigitte. "Assistive technologies in developing countries". Institute of Development Studies. [PDF]. March 1, 2018. https://assets.publishing.service.gov.uk/media/5af976ab40f0b622d4e9810f/Assistive_technologies_in_developing-countries.pdf

Rosangela Berman Bieler and Kees de Joncheere. "Assistive Technology for Children with Disabilitites: Creating Samiul Haque Sunny et al., "Eye-Gaze Control of a Wheelchair Mounted 6DOF Assistive Robot for Activities of Daily Living," *Journal of Neuroengineering and Rehabilitation*, (December 18, 2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8684692/.

Sara Munera et al., "Disability and Rehabilitation Project," *National Library of Medicine*, 2017, https://doi.org/10.4102/ajod.v6i0.360

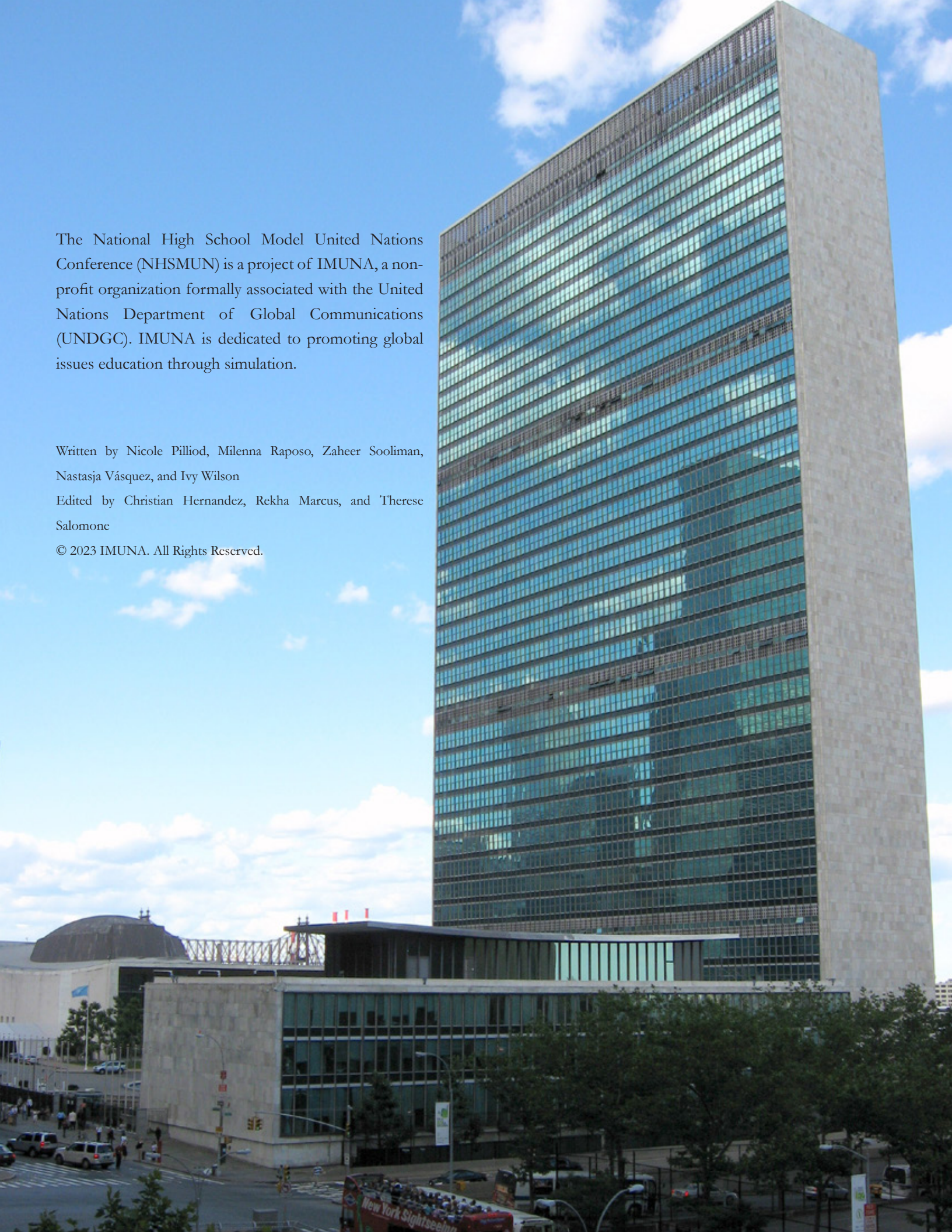
Satish Mishra et al., "Disability and rehabilitation in Tajikistan: development of a multisectoral national programme to leave no one behind," *Public health panorama* 4, no. 02, 2018, https://apps.who.int/iris/bitstream/handle/10665/325032/php-4-2-202-209-eng.pdf

Smith, Elizabeth. et al. "Eyeglasses for Global Development: Bridging the Visual Divide". *World Economic Forum*. June 2016. https://www3.weforum.org/docs/WEF_2016_EYElliance.pdf

Wei Zhang, "Measuring Self-Reported Access to Assistive Technology Using the WHO Rapid Technology Assessment (RATA) Questionnaire: Protocol for a Multi-Country StudyAssistive," *National Library of Medicine*, 2021, https://doi.org/10.3390/ijerph182413336

William Li and Clara Sellers, "Improving Assistive Technology Economics for People with Disabilities: Harnessing the

Voluntary and Education Sectors," *Journal of Rehabilitation Medicine*, 2009, "Glossary," World Health Organization MeDevIS, accessed August 26, 2023, https://medevis.who-healthtechnologies.org/glossary.



The National High School Model United Nations Conference (NHSMUN) is a project of IMUNA, a non-profit organization formally associated with the United Nations Department of Global Communications (UNDGC). IMUNA is dedicated to promoting global issues education through simulation.

Written by Nicole Pilliod, Milenna Raposo, Zaheer Sooliman, Nastasja Vásquez, and Ivy Wilson

Edited by Christian Hernandez, Rekha Marcus, and Therese Salomone