

# Health4TheWorld: Bringing Online Education and Humanitarian Assistance to the World

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Health4TheWorld (<http://www.health4theworld.org>) was established to help the medical needs of people around the world, through education and technology. Unfortunately many people around the world do not have access to health care or medical education. This gap can now be narrowed through online platforms to facilitate education and technology that provides patients and providers with hands-on tools to improve health.

Virtual education and distance learning have benefited greatly by the computer and internet revolution, as shown by their dramatic growth since early 2020. With a projected market value of \$350 billion by 2025,<sup>1</sup> virtual education's benefits are hard to overstate, since it is a flexible and affordable alternative to in-person learning.

Previous research conducted by our group has shown a ubiquitous need for virtual medical education, particularly with respect to radiology, as only 15% of surveyed African countries offer subspecialty training.<sup>2</sup> A similar trend is observed in Asia, where 26% of radiology programs offer subspecialty training<sup>3</sup> and in South America, where as

many as 60% of polled leaders say their program could benefit from more robust subspecialty training.<sup>4</sup>

With the objective of providing free medical education, Health4TheWorld designed an online curriculum for weekly classroom lectures in radiology and medicine in both English and Spanish taught by radiologists from top US academic institutions. It soon became obvious to us that that all medical specialties go hand in hand, and so we expanded our curriculum to encompass 15 specialties.

We have seen significant impact through this outreach. We currently host on the Health4theworld YouTube Channel<sup>5</sup> more than 522 free medical educational videos and have been able to reach more than 122 countries. In 2021, the Health4theworld YouTube channel received 223,473 views.

## Technological Challenges and Solutions

Our global health experience has taught us that there are many technological and other challenges

to overcome. They include adequate high-speed internet connections, developing curricula with metrics to maximize competence, effectively dealing with differences in time zones and languages, addressing the needs of the local population with the appropriate lectures and lastly, creating sustainable environments for virtual medical education.

The founding principle of Health4TheWorld is selfless service. As a volunteer-driven organization, we are inspired by the many passionate individuals who are committed to delivering high-quality education and also help to do so through their service to the organization. This core value has allowed us to make a profound impact on the global medical community, not just radiology. Over the years, more than 200 medical professionals from some of the most prestigious institutions around the world have volunteered to teach. More than 60 institutional chapters have volunteered to participate in online education and assist our organization with marketing, web design, artificial intelligence, and business planning.

For the past three years, the Health4theworld International Radiology Grand Rounds has been held every Friday at 7 am PST. International Radiology Grand Rounds, co-hosted with Road2IR, has been

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held every Thursday, while Medicine Grand Rounds has been held every Tuesday for the last six years.

As mentioned, the lack of access to high-speed internet and other infrastructure in some countries pose a barrier to streaming live lectures online. To help overcome these barriers, our team developed an online learning management website, Health4theworldAcademy.org.<sup>6</sup> The website incorporates free lectures, quizzes, discussion forums, and online certification courses in multiple languages to maximize impact. The quizzes and discussion forums encourage active learning through interaction with the instructors and other students.

All lectures are also available for download from the Health4theworld Academy YouTube channel, which is important in areas with low internet bandwidth, frequent power outages, and other challenges. YouTube also enables lectures to be translated into multiple languages for easy global accessibility.

We have leaned on the power and capacity of the global radiology community to develop comprehensive curricula aimed at diagnosis and management of pathologies associated with high socioeconomic burden. To effectively tackle language differences, we have operated under the motto of, “meeting our communities where they are.” For example, a partnership was created with the Asociación Colombiana de Radiología (ACR), which has helped tremendously in launching our monthly Spanish webinar series, which is directed toward our Hispanic subscribers.

## Mobile Apps and AI Chatbots

The Health4TheWorld Stroke application<sup>7</sup> was launched in 2017 to help provide patients and healthcare professionals with education on poststroke care and stroke prevention. Many stroke patients around the globe do

not have access to rehabilitation;<sup>8</sup> the app, which is intended to help these patients in their journey to recovery from stroke, has been downloaded more than 1,000 times and has feedback by physicians from 22 countries.

We also believe that artificial intelligence-based chatbots with natural language understanding capabilities can positively impact healthcare by providing timely access to medical education and help triage patients in low-income areas. AI chatbots have been implemented in the stroke app to inspire and accompany patients on their road to recovery.

## Virtual Reality and Machine Learning

Virtual reality can be a powerful teaching tool. Considering the precise anatomical detail needed to leverage virtual reality, our organization undertook projects to segment and postprocess various anatomic regions to develop virtual learning strategies.<sup>5</sup> These segmentations were then made available to our team using image projectors, thus eliminating the need for virtual reality headsets.

## Humanitarian Assistance

In 2020, COVID-19 was recognized as a global pandemic. Primary prevention was at the forefront of the fight, precipitating worldwide shortages of personal protective equipment (PPE).<sup>9</sup> We began 3D printing PPE for healthcare workers. As a result, we were able to send face shields and masks to 22 sites in the US and around the world. When an oxygen tank shortage occurred in India during the COVID-19 Delta variant surge,<sup>10</sup> we sent 110 concentrators and 1,250 pulse oximeters to 31 hospitals and rural health centers. After the 2021 earthquake in Haiti, a critical X-ray film shortage affected the imaging of adult and pediatric orthopedic trauma patients. Within days, our organization

was able to arrange donations to help with the crisis.

Now, in the midst of the Ukraine crisis, there is a shortage of medical supplies. Health4TheWorld has been able to send supplies to help personnel care for refugees in Ukraine and Poland.

All these examples highlight the critical role that technology and help from the global community are playing in Health4TheWorld's efforts to bring online education and humanitarian assistance to underserved regions around the world.

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