

INSIGHTS IN PUBLIC HEALTH

The University of Hawai'i West O'ahu Undergraduate Health Science Program: Training the Workforce of the Future

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Abstract

Hawai'i faces a significant healthcare workforce shortage, not only with physicians, but also with health science workers. "Health science" is a hands-on field that combines biomedical and psychosocial aspects of health, disease, and health care. Many of the fastest-growing jobs are in the health sciences, including home health aides, physical therapists, school counselors, and social workers. In Hawai'i, an aging population and the retirement of current health professionals increases the demand for health science workers. Innovative approaches and new care models are essential to meet Hawai'i's needs. One promising solution involves creating four-year undergraduate degree concentrations that train students in marketable skills that are projected to be in demand in Hawai'i, such as in long-term care, community health, and health information management. These bachelor-level graduates could serve critical roles in relieving nurses and physicians of administrative, managerial, care coordination, and clinical data analysis duties that hamper their abilities to practice at the top of their licenses and training. The undergraduate health sciences program at the University of Hawai'i West O'ahu supports students who want to enter these career paths. The program's primary goal is to establish multiple pathways that provide opportunities for underserved youth in West O'ahu communities to choose marketable healthcare careers that pay a sustainable and living wage. Support for this innovative initiative will create a stronger, more well-rounded and sustainable health care workforce that meets Hawai'i's increasing demand for affordable, accessible and high-quality care. The final measure of success will be the quality and number of our graduates from our communities, serving our communities.

Keywords

Health Science, health science program, workforce shortage, doctor shortage, fastest growing occupations, University of Hawai'i West O'ahu, health careers, bachelor of applied science, UHWO-UHSP (University of Hawai'i West O'ahu – Undergraduate Health Science Program)

Introduction

Healthcare is now the largest and fastest-growing industry in the United States.^{1,2} Employment in healthcare is projected to grow 18% from 2016 to 2026, with the industry adding about 2.4 million jobs.³ Driven by an aging population and improvements in medical technology, the demand for healthcare already outpaces the supply.^{4,5} This demand has created a well-documented physician shortage.⁶ It has also created a looming imbalance in the health science workforce.⁷ Over half of the

30 fastest-growing jobs in the United States are health science occupations. This includes home health aides, personal care aides, physical therapist aides and assistants, medical assistants, genetic counselors, occupational therapy aides and assistants, massage therapists, and phlebotomists.⁸ In order to address the tremendous demand, an innovative, mobile, and versatile health science workforce is needed.⁹

Presently, Hawai'i has a shortage of more than 700 physicians.¹⁰ There is a need for more than 300 primary care physicians. The shortage also extends to various specialties including general surgery, orthopedic surgery, infectious disease, critical care, and pulmonology. The neighbor islands of Hawai'i and Kaula'i and underserved rural communities throughout the state suffer the most from the doctor shortage as access to primary and specialty care are limited.¹¹ Ironically, Hawai'i's growing aging population will not only increase the demand for healthcare, but it will also amplify the healthcare workforce shortage with an impending surge of physician, nurse, and health science worker retirements. Similar to national trends, nine of the 20 fastest-growing occupations in Hawai'i from 2008 to 2018 were in health sciences.¹²

West O'ahu communities, which include Waianae, Nanakuli, Kapolei, Ewa, Waipahu, Wahiawa, and Waialua, have critical health care needs. Comprised of five Native Hawaiian Homesteads, the Wai'anana and Nanakuli area has the highest percentage of Native Hawaiians residents on O'ahu.¹³ Unfortunately, Native Hawaiians have poor outcomes on many health metrics compared to the other major racial/ethnic groups in Hawai'i.¹⁴ This includes the highest incidence of obesity, diabetes, cancer, and cardiovascular disease.¹⁵ People with these chronic conditions will require an increased number of patient clinic visits and hospitalizations. Notwithstanding, Native Hawaiians also have many strengths that can be leveraged in the health professions. This includes culturally-based values such as *lokahi* (balance), *'ohana* (family), *aloha* (love and compassion), and *malama* (to care for).¹⁶

The West Side of O'ahu

Kapolei, Oahu's second city, has undergone rapid expansion with the construction of 25,000 homes over the last 25 years. Community challenges include an inadequate highway infrastructure that causes major daily traffic delays.¹⁷ Illustrating the growing problem of overcrowding, in early 2017, the first release of almost 12,000 single-family homes in one development, called the Hoopili project, sold out in one day.¹⁸ Preparing adequate educational, healthcare, and employment resources to match this increase in population is important. It has been postulated that health care may be Kapolei's fastest growing industry.¹⁹

A comparison of the communities in East O'ahu (such as Kahala, Wai'alaie, and Hawai'i Kai) and West O'ahu (such as Wai'anae, Nanakuli, and Kapolei) illustrates the economic, educational, and health disparities between the two areas (Table 1). West O'ahu households suffer from a lower per capita income, more poverty, and lower home values. A greater percentage of the population under 65 years old are disabled in West O'ahu (8.4% versus 3.7%). Most striking is the percentage of the population with bachelor's degrees, with East O'ahu at 56% and West O'ahu at 8%.

Today, the University of Hawai'i West O'ahu has more than 3,000 students. Projected enrollment is 8,000 students by 2028. Although the college is more than 40 years old, the UH West O'ahu campus at Kapolei is only five years old. It is near two upcoming stops of Honolulu High-Capacity Transit Corridor Project, and the current buildings occupy less than 100 acres of its 500-acre parcel, indicating significant room for growth. There is additional room to grow with another 1,000-acre parcel nearby, across the H-1 Freeway on the slopes of the Waianae Mountains. The campus is easily accessible from the freeway, has affordable tuition, and provides free and plentiful parking. In 2017, it gained the distinction of being the fastest-growing US public institution offering four-year degrees, with a 214% increase in enrollment from 2005 to 2015.²⁰

Hawai'i is entering a period where demand for healthcare workers will significantly outpace supply.¹¹ Advancing the health sciences to a more prominent role in healthcare is needed. Now is the time to address the problem and implement innovative, viable, and sustainable solutions. One goal of the UH West O'ahu Undergraduate Health Science Program is to "Grow Our Own" professional workforce by creating multiple pathways to provide West O'ahu youth opportunities to choose stable healthcare careers that pay a sustainable and living wage.²¹ The second goal is to serve as a bridge to seamlessly advance students from high school and community college to a bachelor's degree and on to graduate degrees. And the last goal is to strive for academic, community, and research innovation, and excellence. The vision is that this will help repair the major educational and economic disparities while also improving health outcomes.

Presently, the vast majority of health science occupations require certification and/or an associate degree. These include laboratory technicians, medical assistants, personal trainers, surgical technologists, and medical billing specialists. Unfor-

Category	East O'ahu	West O'ahu
Per Capita Income	\$50,000	\$18,000
Poverty	4%	18%
Native Hawaiian/ Pacific Islander Alone	5%	46%
White Alone	25%	5%
Asian Alone	49%	7%
Home Value	\$903,300 (Hawai'i Kai)	\$478,000 (Wai'anae)
% Disability Under 65 y/o	3.7%	8.4%
Bachelor's Degree	56%	8%

Source: United States Census Bureau, 2012-2016. Home Values: Zillow 2019.

tunately, there is little room for workers to earn salary increases or career advancement with only an associate degree. Another level of health science training is emerging, which includes an additional two years of education to attain a bachelor's degree. This phenomenon, sometimes called "degree creep,"²² is occurring in respiratory care and occupational therapy, where the requirements for taking the certifying or licensure exams will soon include a baccalaureate degree instead of an associate degree.

Adding two more years of education at the undergraduate level allows for a wider range of skills to be taught, and in many cases, additional skills are sorely needed. For example, instead of caring for patients, nurses are now often being pulled off of clinical floors to perform administrative or managerial duties, such as care coordination, discharge planning, specialty referral, case management, and patient navigation. And at the same time, physicians are spending large amounts of time documenting clinical encounters, and yet are not receiving useful analysis of patient data and demographics that could increase the quality of care provided.²³

With the premise that skills such as care coordination and documentation do not necessarily need clinical training, the expansion of the health science worker role to coordinate, manage, document, and evaluate the patient's overall care will free up more nurses and doctors to attend to their patients. In addition, the ability of health science workers to perform at this higher level of skill and responsibility will justify increases in salaries to a living and sustainable wage. Moreover, this will also allow physicians, nurses, and other health professionals to practice at the top of their licenses and training.

It is important to note that many of these bachelor level health science positions are considered totally new occupations. Specific learning and training objectives need to be delineated in partnership with front-line staff, providers, and administrators. In the same way, there needs to be a collaborative effort between Hawaii's health industry, academic institutions, and government to design these degrees and occupations for maximum effectiveness. Determining evidence-based standards of practice and accreditation will be critical to advance this initiative.

The Undergraduate Health Science Program at UH West O'ahu

Presently, the UH West O'ahu Undergraduate Health Science Program offers three established health career degree concentrations. The first is a Bachelor of Arts in Public Administration with a concentration in Health Administration. Established in 2008, it is the oldest health concentration offered at the school and has the highest enrollment. This program is designed for students who want a professional health career that requires a high level of critical thinking, business and financial knowledge, and policy development. It prepares students with a broad range of administrative, management, legal, and behavioral skills. For those already employed in a health care field, earning this degree can increase knowledge, skills and abilities, as well as provide greater career mobility. It is available via both traditional and distance education modalities.

The second is a Bachelor of Applied Science with a concentration in Respiratory Care. Established in 2017, this program is a "2+2" degree based a memorandum of agreement between UH West O'ahu and Kapi'olani Community College (KCC). It is designed for students who have completed a two-year Associate of Science degree in Respiratory Care at KCC and are interested in working for two more years to further their career. It provides training in the use of special equipment, administering medical gases, using positive pressure breathing machines, performing pulmonary drainage and clearance procedures, managing patient airways, and performing pulmonary rehabilitation and home care. Coursework includes a foundation in health administration and also focuses on case and disease management.

Established in 2018, the Bachelor of Arts in Public Administration (PUBA) with a concentration in Community Health is the newest degree concentration offered. The Community Health concentration is designed for students interested in an interdisciplinary approach to health. This program, which is available via both traditional and distance education modalities, provides students with an understanding of community health systems and ways to develop and implement strategies to improve the health of individuals and communities. These students develop a strong foundation in community-based participatory research.

In addition to the above programs, there are four health science degree concentrations that are proposed to be established by Fall 2019. Within the last three years, faculty have been hired to support and design the following degree concentrations:

- Bachelor of Applied Science (BAS) with a concentration in Health Professions
- Bachelor of Applied Science with a concentration in Hawaiian & Indigenous Health & Healing
- Bachelor of Arts in Public Administration with a concentration in Long-Term Care
- Bachelor of Applied Science with a concentration in Health Information Management

The Health Professions BAS is for students interested in pre-medical, pre-dental, pre-pharmacy, pre-PA, pre-OT, and pre-PT studies. Comprehensive coursework in the Natural Sciences (chemistry, biology, and physics) is supplemented with components of health career options, professionalism, and problem-based clinical cases. Students will learn laboratory techniques, CPR/AED/First Aid, and correct handling of blood borne pathogens (via OSHA certification) and health information (HIPAA).

The Hawaiian & Indigenous Health & Healing (HIHH) BAS is for students interested in traditional healing. Students work towards a better understanding of Hawaiian culture and values through the transfer of knowledge and skill in the traditional healing arts of *Ho'oponopono*, *La'au Lapa'au*, and *Lomi Lomi*. The integration of practitioners of these arts into larger healthcare teams is critical in the preservation of these traditional healing arts. As noted above, this has high relevance for our community in West O'ahu.

Given the increases in the number of elderly patients in Hawai'i, the demands of caring for people with chronic disease, and the advances in health-focused technology, the last two degree concentrations to be established will possibly have the most impact in terms of growing employment and overall patient care. The long-term care bachelor's degree is for students who want to focus on the long-term care (LTC) needs of Hawaii's aging population. It prepares students with the conceptual, technical, and interpersonal skills and competence necessary to work in LTC facilities and community-based organizations. It also addresses Hawaii's high demand for LTC providers, paraprofessionals, and skilled workers. This degree is available in both traditional and distance education modalities.

The Health Information Management BAS is designed to equip students with integrated knowledge of medicine, science, technology, and management. The coursework for this program will focus on ensuring that health data maintains its integrity, accuracy, accessibility, and security. Students will acquire vital leadership skills in health informatics, revenue cycle management, data analytics, and information governance.

These seven degree concentrations described lay the academic foundation of the UH West O'ahu Undergraduate Health Science Program (UHWO-UHSP). The courses are designed to be student-centered, intradisciplinary, and transdisciplinary. In addition, each program includes required courses to infuse Native Hawaiian values and culture to support the UH West O'ahu objective of being indigenous-serving. And, the three training tenets are:

1. Training must be based in the community
2. Training must be hands-on and realistic
3. Training must create interdisciplinary teams

Work in Progress

Three foundation-laying events have shaped the progress thus far to build the program. The first occurred in March 2018, when the Hawai'i State Legislature appropriated \$550,000 to the UH West O'ahu Health Science Program to hire six new permanent faculty and student support staff. The faculty positions included assistant or associate professorships in chemistry and physics to strengthen the school's capacity in natural science, and in health information management and Indigenous health science to build the health science program. The health information management (HIM) faculty is especially needed because accreditation in HIM depends upon having at least two full time faculty. The Indigenous health science faculty will serve as the lead coordinator for the Hawaiian & Indigenous Health & Healing BAS degree concentration. It is the first and only position of its kind in the nation. While there is a Master of Public Health degree program with a specialization in Native Hawaiian and Indigenous Health at the University of Hawai'i at Manoa, there are no undergraduate degrees with this focus.²³ The other two positions are in student support. They include an advisor/counselor and a curriculum specialist, and both are dedicated to the health science program.

The second was the construction and grand opening of a new Administration/Health Science Building on campus on December 12, 2018. Costing over \$32 million and encompassing over 44,000 square feet, the building includes 10 classrooms and three laboratories (equipped for classes in anatomy/physiology, cellular biology, and microbiology). At the ceremony, Ryan Domingo, a junior pre-medical student, summed up the sentiment of his fellow classmates: "As a student who will conduct research and have several classes here this coming January, I am filled with a strong sense of pride and promise. I have pride in becoming the first of my peers to walk these halls and classrooms, holding on to the promise of following the footsteps of many others who have graduated from this wonderful place of learning."²⁴

The final and latest foundation laying event took place on February 28, 2019, when the University of Hawai'i Board of Regents approved the new degrees of a Bachelor of Science in Natural Science (BSNS). The BSNS is significant because it is the first STEM degree and bachelor of science degree offered at UH West O'ahu. This degree program will be housed in the newly created and approved Division of Math, Natural and Health Science. Future plans include designing a BSNS with a concentration in Health Science that will prepare students for graduate work towards a health professions master's or doctorate degree.

Our Students, Our Future

After laying a strong foundation, the next phase in the UHWO-UHSP development will be the recruitment of more faculty, staff, partners, and students. Presently, all six positions appropriated by the legislature are in their respective search committees with a projected hiring date of August 1, 2019. Seeking collaborative partners is critical. Partners within the University of Hawai'i

System are needed to create articulation agreements across campuses. Seamless transitions for students can be made by building bridges between high school and early college programs, associate-level programs at community colleges, and professional degree programs (ie, MD, PharmD, PhD, MSN, MSW, and MPH). Partners in the health industry are necessary to guide program focus and provide sites for clinical and non-clinical internships. They will be critical in establishing marketable minimal and desirable qualifications and a salary scale that will hopefully pay a sustainable wage. Presently, The Queen's Medical Center West O'ahu, Waianae Coast Comprehensive Health Center, Hospice Hawai'i, and Heartsavers (CPR Certification) are partners of the UH West O'ahu.

Recruiting students into the program will be challenging. More than 20 new courses have recently been created. Some of these include:

- HLTH 117: "Survey of Health Professions"
- HLTH 123: "Introduction to Clinical Skills and Patient Care"
- HLTH 204: "Introduction to Native Hawaiian & Indigenous Health & Healing"
- HLTH 205: "Hawaiian Ways of Healing"
- HLTH 315: "*Ho'oponopono* – Practical Applications"
- BIOL 302: "The One Health Approach to Infectious Disease"

Insights into students' goals can be gained from surveys, and currently, in both HLTH 117 and HLTH 123, pre- and post-course evaluations are completed by students. A review of the responses from the first three HLTH 123 classes held over the last three semesters revealed that the vast majority of undergraduate students are not aware of the option to pursue health science as a career (Table 2). Among the students who completed the evaluation, 84% were women, 82% were from West O'ahu communities, and 98% attended public high school. West O'ahu public high schools (HS) that were attended included Waianae HS, Nanakuli HS, Kamaile Academy HS, Kapolei HS and Waipahu HS. Central O'ahu public high schools included James Campbell HS and Leilehua HS. Honolulu public high schools included Aiea HS and Radford HS. There were no students from Windward or East O'ahu public high schools.

Reviewing the students career goals, most concerning is that 24% want to be physicians, 31% want to be nurses, but only 5% wanted to go into health science (see Table 2). When analyzing specific occupation goals, the students show more knowledge and clear-cut selections within the doctorate-level clinical occupations versus bachelor-level health science occupations. But exposure to options can change a trajectory. These data suggest that wide spread marketing and recruitment of students will be required to increase awareness of the seven degree concentrations offered in the health science program.

Conclusions

Just because people are poor does not mean that they deserve poor healthcare, in poor facilities from poorly-trained doctors. And, just because people are poor does not mean that they deserve a poor education, in poor campus facilities, from

Table 2. Results of Course Evaluations Completed by University of Hawai'i West O'ahu Undergraduate Students in Introduction to Clinical Skills and Patient Care (HLTH 123)		
Career Goal N=94		
Career	Number	Percentage
Physician	22	24
Non-Physician Doctorate	5	5
Physician's Assistant	3	3
Nurse Practitioner	4	4
Registered Nurse	25	27
Health Care Administration	13	14
Health Science	5	5
Other / Undecided	17	18
Total	94	100 %
Specific Occupation Goals		
Health Science (n = 5) 5%	Nursing (n = 29) 21%	Physician / Doctorate (n = 27) 29%
Laboratory Technician = 2 Sonographer = 1 Dental Hygiene = 1 Medical Assistant = 1	Nurse Practitioner = 4 Neonatal Nurse = 3 Pediatric Nurse = 1 Registered Nurse, Unspecified = 21	Premedical Undecided = 4 Pediatrician = 5 Surgeon = 1 Neurosurgeon = 1 Neurologist = 1 Emergency Medicine = 2 Pathologist = 2 Obstetrics/Gynecology = 2 Radiologist = 2 Dermatologist = 1 Geriatrics = 1 Neonatology = 1 Clinical Psychology = 1 Pharmacist = 1 Biomedical Engineer = 2

poorly-trained professors. Healthcare is more than just giving out pills, it is also about providing education and employment. The UHWO-UHSP can help address health and economic disparities in underserved West O'ahu communities, as well as fight the growing healthcare workforce shortage. This endeavor will require the collaboration and cooperation of Hawaii's health industry sector, the University of Hawai'i system, state and federal government entities, and West O'ahu communities. Support for this innovative initiative will create a stronger, more well-rounded and sustainable health workforce that meets Hawaii's increasing demand for affordable, accessible and high-quality care. With growing our own as the goal, the final measure of success will be in the quality and number of our graduates from our communities, serving our communities.

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