

UNIVERSITY OF HAWAI‘I SYSTEM ANNUAL REPORT



REPORT TO THE 2025 LEGISLATURE

Annual Report on Findings from the
Hawai'i Physician Workforce Assessment
Project

Act 18, SSLH 2009 (Section 5)
Act 186, SLH 2012
Act 40, SLH 2017

December 2024

Hawai'i Physician Workforce Report 2024

Executive Summary

Of the more than 12,000 licensed physicians in Hawai'i only 3,672 are currently providing patient care to Hawai'i's population. Further, of those practicing, not all physicians practice full-time, thus these 3,672 individuals provide approximately 3,075 Full-Time Equivalents (FTEs) of active patient care. These numbers are 73 individual providers and 55 FTEs more than in 2024. The demand model used to estimate how many physicians are needed is based on the US average utilization of physician services by specialty as applied to the demographic characteristics and health risk factors of each of Hawai'i's four counties. Adaptations for geographic barriers and time-sensitive coverage needs were made for practitioners of Emergency Medicine, Critical Care, Orthopedic Surgery, Urologic Surgery, Cardiothoracic Surgery, Vascular Surgery, Neurologic Surgery, and Psychiatry. The demand model indicates the State of Hawai'i needs 3,618 FTEs of practicing physicians, indicating a statewide shortage of 543 FTEs of physician services. However, when the geographic realities of specialty coverage on different islands are addressed, the unmet need for physicians equals 768 FTEs statewide.

The greatest statewide shortage remains in primary care, with 152 FTEs needed in total across all islands. The greatest subspecialty statewide shortages include Pediatric Gastroenterology, Pediatric and Adult Endocrinology, Pediatric and Adult Pulmonology, Colorectal Surgery and Thoracic Surgery.

Activities pursued by the Physician Workforce team coordinated by our Area Health Education Center (AHEC) to increase the physician population include ongoing recruitment of physicians to Hawai'i through recruitment booths at national conferences, regularly updated job board at [AHEC.hawaii.edu](https://www.ahec.hawaii.edu); maintaining the workforce database and providing presentations as requested throughout the state; providing continuing education including the Hawai'i Health Workforce Summit (784 participants in 2024) and Project ECHO (658 people received 4,980 people-hours of case-based education in 2023); starting up the new Governor supported \$30,000,000 Hawai'i Healthcare Education Loan Repayment Program (HELP) by funding loan repayment for 800 individuals; supporting legislative efforts to exempt clinicians from the General Excise Tax on public insurances (double tax on private practices); supporting neighbor island clinical teaching, travel, lodging, community activities and recruitment of health career-focused learners; assisting with administering the Hawai'i Preceptor Tax Credit; and mentoring young physicians. Activities introduced in 2024 include supporting lobbying efforts in Washington DC to increase Medicare reimbursement rates and continuing working groups in five areas identified as important to building the workforce: administrative simplification; increasing revenue/pay; incentivizing healthy patient behavior; and electronic health record/telehealth.

Background

Recent national estimates of physician supply indicate a current shortage of between 40,000 and almost 60,000 practicing physicians in the United States, and this shortage is expected to grow to 139,000 physicians by the year 2033.¹ Much of this projected shortage is attributed to an aging population which will require more medical care, and an aging physician workforce which is increasingly considering retirement.¹ The American Association of Medical Colleges found that in 2023, 22.3% of physicians in the US were already 65 years old.¹ Furthermore, COVID has negatively affected practicing physicians, both physically and psychologically, as have the Maui wildfires. The Physician Foundation found that as many as 61% of physicians are suffering from moral distress and burnout and that physicians have three to five times the suicide rates of the general population.² Thus, many challenges face the physician workforce. The current study of Hawai'i's physician workforce began in 2010 to measure the number and distribution of physicians by specialty in order to help the state work toward building the ideal health workforce.

Project Methodology

Supply

The supply of physicians in Hawai'i is estimated based on a voluntary relicensure survey, queries of local community contacts, internet searches, and direct calling of physician offices to confirm hours of active patient care. The phone calls were performed by staff from the Area Health Education Center (AHEC) office at the University of Hawai'i John A. Burns School of Medicine and trained pre-health interns working with the AHEC. The script used is included in Appendix 1. It includes confirming whether the physician works at the office, his/her specialty, how many hours s/he works each week on average, if s/he has other office locations or has partners working in the office. These numbers are converted to a Full Time Equivalent (FTE) based on a 40-hour week representing 1.0 FTE. Although many physicians work more than 40 hours a week, this number is used as a baseline for full-time effort and 1.0 is the maximum allocation given to a physician.

Demand

There is no perfect estimate of the ideal number of physicians per population or physician mix for an island population such as ours in Hawai'i. Therefore, a demand model was purchased from a well-known healthcare workforce modeling organization IHS Markit³ which performs demand estimates for the federal government and other

¹ [https://www.aamc.org/data-reports/data/2023-key-findings-and-definitions#:~:text=In%202022%2C%2023.2%25%20of%20active,Data%20by%20Specialty%20and%20Location\).](https://www.aamc.org/data-reports/data/2023-key-findings-and-definitions#:~:text=In%202022%2C%2023.2%25%20of%20active,Data%20by%20Specialty%20and%20Location).)

² <https://physiciansfoundation.org/new-survey-reveals-55-of-physicians-know-a-physician-who-considered-attempted-or-died-by-suicide/>

³ IHS Markit, <https://ihsmarkit.com/index.html>

large organizations. The model was purchased from IHS Global in 2021. The major components of the demand model include:

1. A population database that contains characteristics and health risk factors for a representative sample of the population in each Hawai'i county,
2. Predictive equations are based on national data that associate a person's demographic, socioeconomic, and health risk factor characteristics to his or her demand for healthcare services by care delivery setting, and
3. National healthcare delivery patterns that convert demand for healthcare services to demand for FTE of physicians.

For purposes of physician workforce modeling, the relevant settings are physician offices, outpatient clinics, hospital emergency departments, and hospital inpatient settings. While the forecasting equations and staffing patterns are based on national data, a population database was constructed for Hawai'i that was representative of the population in each county of Hawai'i. This was done using county-level population information (e.g., age-gender-race/ethnicity), whether a county was considered metropolitan or non-metropolitan, and information from the Behavioral Risk Factor Surveillance System (BRFSS) for the population, including summary statistics by county for factors such as the prevalence of obesity, diabetes, current smoking status, and other risk factors used in the model.

All data used in this model originated from sources before the COVID-19 pandemic, so this data does not reflect changes in physician use patterns due to the global pandemic. The numbers included in this report are based on average demand for services under normal healthcare circumstances, not a situation of unusual demand patterns such as we have seen since March 2020. The new model also has pediatric subspecialty estimates for most subspecialties which were not available previously.

Applying the IHS Markit model to Hawai'i produced estimates of physician demand by specialty representing the demand for service if the people in each county were to receive a level of care consistent with the national average while adjusting for differences across counties in demographics, health, and economic factors that affect demand for health care services. To adapt to the island geography of Hawai'i, three changes were made to the model in collaboration with the model's creators:

1. Tourist use of emergency care: Emergency physician demand was increased to cover the percentage of Emergency Department (ED) visits which were made by non-residents in each county. The hospital ED visit numbers were obtained for 2016-2019⁴ and ED and inpatient demand was increased by the

⁴ Hospital billing data archive of the Laulima Data Alliance. Analyzed by Hawai'i Department of Health and provided to research team.

- percentage of non-residents receiving emergency care in that county.
2. Emergent surgical and intensive care services: Based on current research of best practices,^{5,6} the research team believes that every patient should be within half an hour of a hospital with available emergency surgical capabilities to provide orthopedic, urologic, cardiothoracic, neurologic and vascular care. However, this is not possible on all islands of Hawai'i. Therefore, to create a best-case, but reasonable scenario, each island with a Level III or higher trauma center (Kaua'i, O'ahu, Maui, and Hawai'i Island) was estimated to need at least 2.0 FTE of surgeons from the specialties noted above (orthopedic, urologic, cardiothoracic, neurologic and vascular care). Hawai'i Island was estimated to need twice that due to its geographic size (4.0 FTE). Of course, a group of only two providers in a community for a discipline is challenging to maintain due to on-call responsibilities. Unfortunately, it would be difficult to support much larger practices in rural areas, and, given low physician reimbursement levels compared to cost of living in Hawai'i, the market may not be able to support what is recommended here. Furthermore, during discussion with local physicians, it became clear that it requires at least 5.0 FTE to staff a full time ICU due to the 24/7 nature of the work. Therefore, all eight level I to III trauma centers were counted as requiring 5 ICU physicians.
 3. Psychiatry demand: The need for Psychiatry care has long been reportedly underestimated. The most recent assessment of Psychiatry demand in Hawai'i is 20.5/100,000 population.⁷ This number is between the range of numbers estimated in different national publications of 3.9⁸ to 25.9⁹ per 100,000 population. To find the number of adult and child psychiatrists needed per county, the ratio was multiplied by the population of each county and then divided into the percentage of adult to child psychiatrists estimated in the IHS Markit demand model. Use of this ratio greatly increased psychiatrist demand estimations and, the authors believe, more accurately reflects the need in Hawai'i.

These changes are incorporated into the tables in Appendix 2.

⁵ McCrum, M. L., Wan, N., Lizotte, S. L., Han, J., Varghese, T., & Nirula, R. (2021). Use of the spatial access ratio to measure geospatial access to emergency general surgery services in California. *The journal of trauma and acute care surgery*, 90(5), 853–860.

⁶ <https://www.facs.org/-/media/files/quality-programs/trauma/vrc-resources/resources-for-optimal-care.ashx>

⁷ Aaronson A, Withy K. Does Hawai'i Have Enough Psychiatrists? Assessing Mental Health Workforce Versus Demand in the Aloha State. *Hawaii J Med Public Health*. 2017 Mar;76(3 Suppl 1):15-17. PMID: 28435753; PMCID: PMC5375008.

⁸ <https://openminds.com/store/the-2018-open-minds-state-by-state-guide-to-estimating-the-number-of-psychiatrists-an-open-minds-market-intelligence-report/>

⁹ Satiani, A., Niedermier, J., Satiani, B., & Svendsen, D. P. (2018). Projected Workforce of Psychiatrists in the United States: A Population Analysis. *Psychiatric services (Washington, D.C.)*, 69(6), 710–713.

<https://doi.org/10.1176/appi.ps.201700344>

Shortage

The shortage of physicians is calculated by subtracting supply from demand. This number is further refined to consider geographic restrictions caused in an island state by eliminating overages of subspecialists on each island. This means that for all specialties other than primary care, any overage (i.e., when physician supply is more than demand on an island) is zeroed out, as it is unlikely a specialty physician can fill in for a physician of another specialty. Since the excess of physicians in a discipline is of no advantage to an island it is eliminated from the calculation. The exception to this practice is primary care, as the four professions in primary care (Internal Medicine, Pediatrics, Family Medicine, and Geriatrics) can usually cover each other and thus an overage in one area of primary care was not zeroed out. This number appears in Appendix 2 as “Shortage (without overage)”. The percentage of shortage is then calculated by dividing the total “Shortage” number by the “Demand” number (Demand minus Shortage)/(Demand).

Other Data Collection

Physician age, gender, ethnicity, practice size and employment status are obtained as available from internet searches and the licensure survey. Retirement, death, and moved out of state status were obtained from community contacts, internet searches, or the physician's office upon phone call.

Project Results

Workforce statistics obtained from relicensure survey, internet searches, public records, community contacts, and calling of physician offices indicate that in 2024, Hawai'i has approximately 3,075 FTEs of physicians caring for patients.

Table 1: Hawai'i Physician Supply Trend (in Full Time Equivalents)

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
FTE	2894	2802	2806	2903	2978	2927	2974	2812	2857	2962	3022	3075

The demand model based on US average physician use when applied to Hawai'i's four counties indicates the State of Hawai'i needs 3,618 FTEs of practicing physicians. This indicates a shortage of 543 FTE of physician services. However, when island geography is considered (i.e., eliminating specialty overage), the estimated unmet need for physicians increases to 768 FTEs. County-level differences are listed below.

Table 2: Physician Shortage by County (Prior year numbers in parentheses)

	Hawai'i County	Honolulu County	Kaua'i County	Maui County	Statewide
Shortage	201 (206)	328 (318)	43 (52)	174 (181)	768 (757)
Percent	40% (41%)	13% (13)	24% (30)	41% (43)	21% (21)

Table 3: Primary Care Physician Shortage by County (Prior year numbers in parentheses)

	Hawai'i County	Honolulu County	Kaua'i County	Maui County	Statewide
Shortage	20 (17)	86 (59)	6 (6)	41 (42)	152 (123)
Percent	13% (12%)	11% (7)	12% (11)	32% (33)	13% (11)

Additional facts about the active physician workforce in Hawai'i

- ▶ Our practicing physicians range from age 28 to age 91 in age. The average age is 54.7 years (compared to 53.9 US average) up slightly from 53.4 in 2023.
- ▶ Currently 24% of our physicians are already age 65 years or over, constituting 797 practicing physicians (up slightly from 22% in 2023)
- ▶ Women make up 39% of the physician workforce (same as 2023).
- ▶ Ethnicity data is available for 2/3 of physicians and is outlined below. African American, Native Hawaiian and Pacific Islander physician numbers have all increased since 2020.

Table 4: Hawai'i Physician Ethnic Makeup

African American	Asian	Pacific Islander	White	Hispanic	Native Hawaiian	Other / Hapa	Total
48	1211	75	911	65	161	195	2666
2% (up from 1% in 2020)	45%	3% (up from 2% in 2020)	34%	2%	6% (up from 4.5% in 2020)	7%	100%

- ▶ In 2024, 69% of physicians were employed compared to 56% in 2016 and 58% in 2020.
- ▶ Practice size has also shifted to a greater proportion of large groups. In 2014 54% of physicians were in groups of less than six. Now only 42% are.

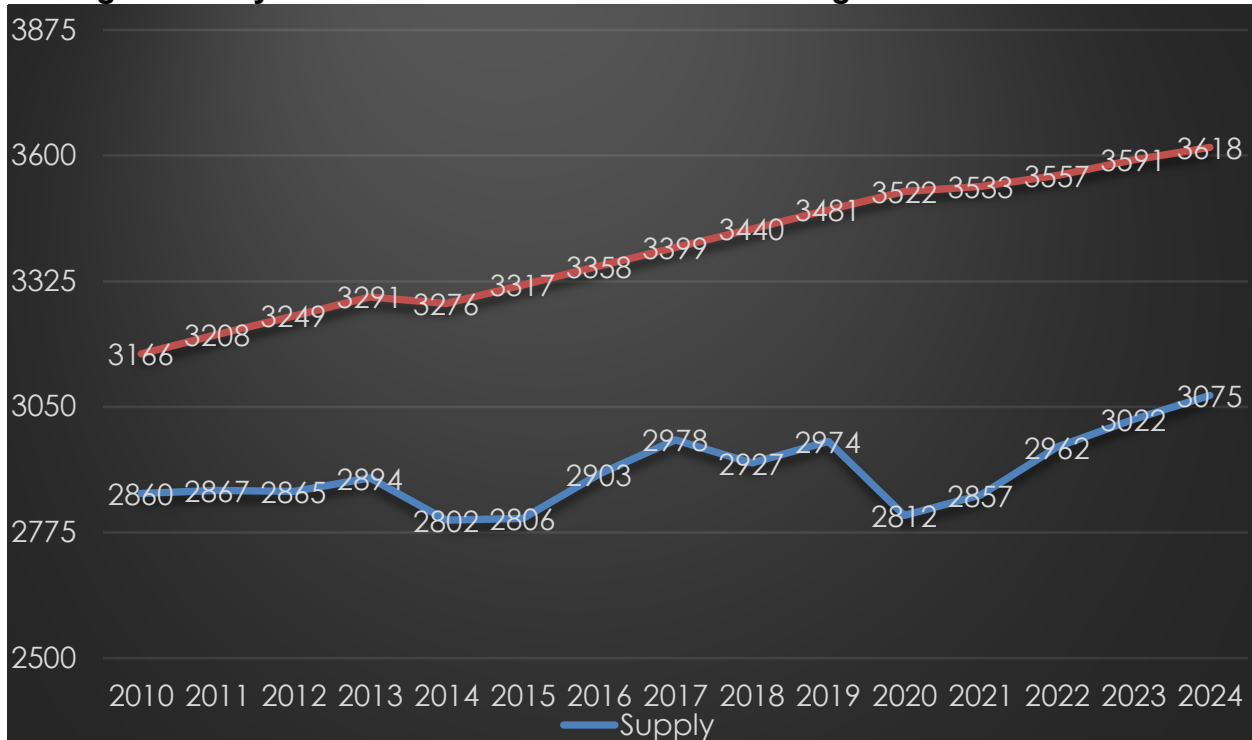
Table 5: Physician Practice Size 2024

Solo (1-2)	Small (3-5)	Medium (6-9)	Large (10+)
28%	14%	12%	46%

- ▶ In 2024, at least 91 physicians retired, 10 passed away, and 174 moved away.

The documented physician workforce changes since the Hawai'i Physician Workforce Assessment began are outlined in Figure 1 below.

Figure 1: Physician Workforce Assessment Findings from 2010 to Present



The greatest shortage category is primary care where we need 152 additional Full Time Equivalents (FTEs). The greatest subspecialty shortages by percent are outlined in Table 6 below. The Individual Specialty Shortages by County Estimates tables are included in Appendix 2.

Table 6: Greatest Subspecialty Shortages by Percentage, Statewide

Specialty	FTE Shortage	Percent Short
Child Gastroenterology	6.7	81%
Child Pulmonology	3.5	64%
Adult Endocrinology	17.3	60%
Child Endocrinology	4.7	59%
Adult Pulmonology	33.7	57%
Thoracic Surgery	10.7	56%
Colorectal Surgery	6.1	56%

Future Trends

The demand model predicts our demand will increase by at least 30 FTE a year. If we only increase our workforce by 55 FTE a year, we will not meet our demand in the foreseeable future. However, IF we can net 100 new physician FTEs a year to the Hawai'i workforce, it may be possible to meet our demand by the year 2032.

Limitations of the Research

This research is intended only to track the size and distribution of the physician workforce in Hawai'i. The purpose of this activity is to assist in guiding the development of the right-sized physician workforce in Hawai'i so that everyone in Hawai'i has access to services where they need them and when they need them. The data are imperfect due to many challenges. Every workforce is fluid in this day and age, the physician workforce is no exception. An estimated 20% of physicians move or change their work setting annually. Thus, the data collected is an estimate as of September 2024 but is ever-changing.

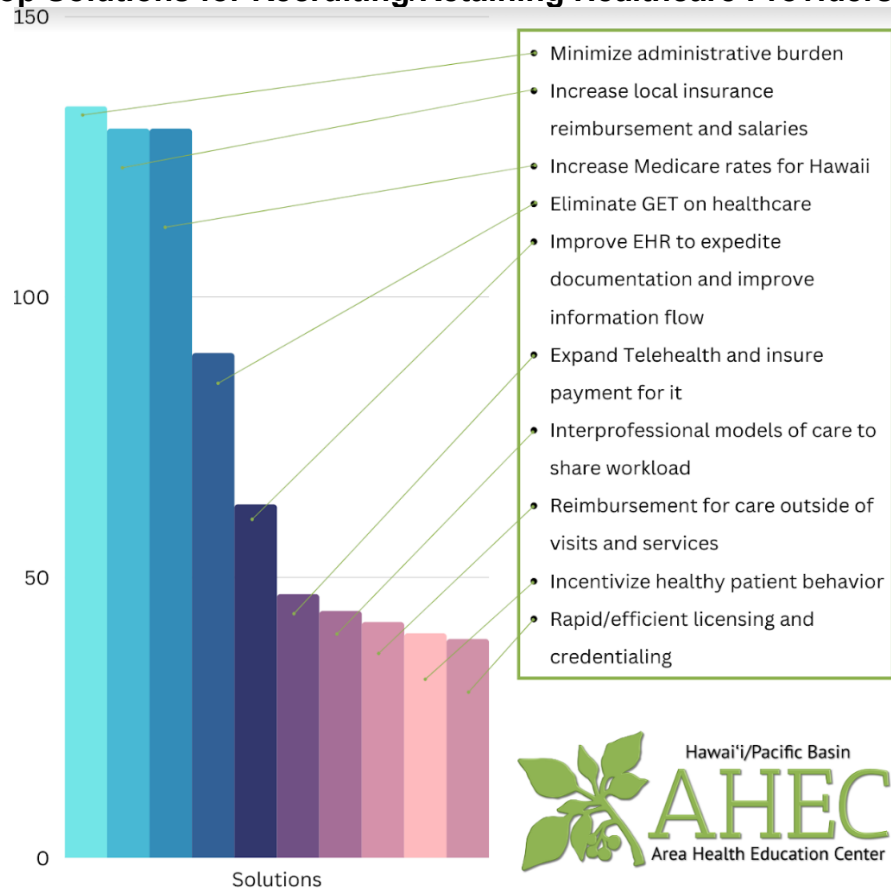
Furthermore, we encountered difficulty identifying time spent in each specialty for physicians who have multiple specialties. For example, medical subspecialists usually complete an Internal Medicine residency before completing a fellowship in a subspecialty. Therefore, they are skilled at both primary care and their subspecialty. It is difficult to allocate amount of time they commit to each activity, and it is estimated based on the answers to the licensure survey and interaction with their staff during annual phone calls. This is even more challenging with providers who serve both adults and children. There is a severe shortage of pediatric subspecialists, so in the past, adult providers sometimes also served pediatric patients, this is less likely now as subspecialization is increasing. However, this is often difficult to disentangle when quantifying services to pediatric versus adult patients, especially in surgical care. Furthermore, 63 locums were found working in Hawai'i temporarily who are not included in the analysis because of the short-term nature of locum's contracts, but may impact the supply numbers.

Finally, the Maui wildfires exacerbated an already significant shortage of providers and eliminated multiple healthcare facilities which have not been rebuilt. Providers and patients moved location or out of state as a result. For this reason, the Maui landscape is even more fluid than previously and the numbers are likely even worse than estimated in this document.

Interventions to Recruit and Retain Physicians to/in Hawai'i

In September 2022, the 901 participants at the Hawai'i Health Workforce Summit were asked what needs to be done most urgently in Hawai'i to recruit and retain healthcare providers. Almost half of the participants answered and the top answers are outlined below in Figure 2.

Figure 2: Top Solutions for Recruiting/Retaining Healthcare Providers in Hawai'i



As a result, four public committees have been formed, of which three are ongoing: Finances; EHR/Telehealth; and Incentivizing Healthy Patient Behavior. The Interprofessional Models of Care Committee met for a year and developed an outline of resources and best practices. The group is currently preparing a white paper and journal article for publication.

Solutions are being developed and as described below.

1. For Administrative Burden, a small workgroup of insurance representatives, private practice physicians and medical group representatives met to review the extensive list of prior authorization requirements and work to simplify them. This group reviewed the results of a 2022 follow up survey to the results in Figure 3 regarding specifics of priority actions for administrative simplification. One hundred and seventeen physicians responded regarding how to improve administrative burden and the nine categories in order of mention for improvement are listed below:
 - a. Prior Authorization
 - b. Training or personnel hires
 - c. EMR Ease of use

- d. Billing
- e. Credentialing/licensure
- f. Quality Metrics
- g. Pharmacy
- h. Telehealth
- i. Travel (patients or providers)

Exploring Prior Authorization is extremely complex, as each different health plan from each health insurer has different prior authorization requirements for pharmacy, durable medical equipment, procedures and travel. This group successfully uncovered that there are fewer requirements for prior authorization than there were thought to be and a standardized prior authorization form was shared with physicians across Hawai'i to facilitate streamlined practice.

The latest effort is exploring the possibility that Hawai'i Legislative Reference Bureau could perform an audit to assess the cost for insurance companies to comply with modified American Medical Association recommendations:

- Establish rapid response times (24 hours for urgent, 48-72 hours for nonurgent care) for approval or denial (not just request for additional information).
- Adverse determinations should be made only by a physician licensed in the state and of the same specialty that typically manages the patient's condition.
- Prohibit retroactive denials if care is preauthorized.
- Authorization should be valid for at least 1 year, regardless of dose changes, and for those with chronic conditions, the prior authorization should be valid for the length of treatment.
- Require public release of insurers' prior authorization data by drug and service as it relates to approvals, denials, appeals, wait times and more.
- A new plan should honor the patient's prior authorization for at least 60 days.
- Volume reduction using solutions like prior authorization exemptions or gold-carding programs (if a physician has less than 8-10% of prior authorizations denied, they don't have to submit prior authorization requests).
- Facilitate the introduction of AI to improve efficiency and accuracy of prior authorization.
- Create an online dashboard integrated with patient portal, or provide a way for patients and providers to find out the status of a prior authorization request.

This could be paired with a local government appointed commission to oversee prior authorization simplification and further legislation as needed.

2. Solutions for improving financial incentives for providers

Ongoing Physician Workforce activities designed to grow, keep, and support the physician workforce include increasing practice sustainability. While the percent of employed physicians has increased significantly, private practice is still the status of one third of Hawai'i's physicians. Successes in improving the financial status of private practice in the past year include the State Legislature exempting healthcare practices from paying the General Excise Tax on services to patients. Hawai'i is one of two states that taxes services (as well as goods). Because it is illegal to charge patients with Medicare or Medicaid more than their set rates, a practice cannot ask patients to pay the general excise tax on any services they provide to patients with these public insurances. The 4.5% tax that patients with private practice have to pay out of pocket on medical services instead is paid by the physician practice and comes out of practice revenue. Exempting this tax will save medical practices approximately 10% of their budget a year, depending upon what percent of their practice is Medicare and Med-Quest and their overhead costs.

In the arena of payment, the Physician Workforce funding is helping to support lobbying efforts in Washington DC to raise Medicare rates in Hawai'i. This can be accomplished either through Center for Medicare and Medicaid Services (CMS) or through federal legislation. The **PROTECTING ACCESS TO CARE IN HAWAII (PATCH) ACT** is a federal bill that would do this for Hawai'i, and is introduced and seeking broad support. Other methods are being worked on concurrently. The goal is to increase the Geographic Cost Price Index for Medicare to 1.5, similar to that of Alaska. In this time of inflation, it is disconcerting that the Medicare rates are actually expected to decrease, so this is an important area of attention to help practices in Hawai'i survive and thrive.

Finally, research into what it will take to bring doctors to Hawai'i who already have Hawai'i licenses was conducted. A collaborative effort between multiple local partners including HMSA, Department of Health and University of Hawai'i supported this study by Omnitrack. The findings indicate that of the 300 physicians who answered the online survey, half of them would move to Hawai'i if four things were put in place:

1. Pay at 110% of current income.
2. Hawai'i Tax credit of 50% for three years.
3. Quarter point lower interest rate for home purchase.
4. Four-day work week.

This research will be shared broadly and government, employers and banks will be asked to work to make this a reality by the Physician Workforce Research team, starting with recruiting to neighboring islands.

3. The Improving telehealth and electronic health records committee has met multiple times. As a result, the Physician Workforce Research team has offered to fund participation in Hawai'i Health Information Exchange for private practice physicians without significant interest. Also, partnership with OCHIN, a national organization that assists with EHR implementation has been offered. Furthermore, broad band access is being expanded for rural areas where connectivity is poor. Work is ongoing in this area and AHEC provides a free telemental health service at hawaiiutelehealth.org and supports the Public Library computer/hot spot loan program to facilitate telehealth.
4. Incentivizing Healthy Patient Behavior is meeting monthly and working with the insurers, BlueZones and Department of Health to promote knowledge transfer of healthy options for exercise and fitness. Physician Workforce funds and resources have been offered to providers interested in starting a Walk With a Doc program in their area.

Other Solutions Being Implemented

Physician Recruitment

- ❖ AHEC actively works to recruit physicians by attending the American Academy of Family Physicians and the American College of Physicians annual meetings and staffing a recruiting booth. In addition, AHEC posts all Hawai'i physician job openings online through collaboration with the Hawai'i Physician Recruiters Group. The AHEC.hawaii.edu website advertises job opportunities in Hawai'i to providers interested in practice and disseminates information. This endeavor includes personnel searching the web for all available postings and working with recruiters to post their jobs. Physician practices wishing to hire or transition their practice are offered assistance with the creation of an advertisement for a new provider. Direct assistance has been provided for 8 practices during the current year to connect to a new provider.

Figure 3: Dr. Withy at American Academy of Family Physicians FMX 2024



- ❖ In addition, JABSOM Alumni Association regularly spreads the word about opportunities in Hawai'i to JABSOM graduates and assists with sending recruitment information to graduates. AHEC is also collaborating with Hawai'i Residency Program on their Annual Physician Career Pathways Event and supporting regular get togethers of the Hawai'i Young Healthcare Professionals group.
- ❖ A new idea is when physicians who go to educational conferences on the Continent, they are encouraged to talk to colleagues about moving to Hawai'i. **If a Hawai'i physician takes another doctor out to dinner to recruit them to Hawai'i, AHEC will reimburse for dinner** up to \$50 per person with itemized receipt and meeting participant list (although we cannot reimburse for alcohol).
- ❖ Incentives: The Physician Workforce Assessment team is working with the Hawai'i State Rural Health Association and the Hawai'i Physician Recruiter's Group to expand rural incentives, community welcoming of providers, and increase the ability for spouses to find jobs.
- ❖ The Bridge to Practice initiative encourages residents in primary care graduate medical education programs to be mentored by and explore work opportunities in independent practices across Hawai'i. It is hoped that this program will encourage physician residents and fellows to practice in healthcare need areas upon graduation and assist physicians who want to retire.
- ❖ Physician Resources: the Area Health Education Center lists resources for physicians, including connections with Hawai'i Young Healthcare Professionals, support for purchasing housing and loan repayment at:
<https://ahec.hawaii.edu/ahecsite-forhealthcareprofessionals/practice-in-hawaii.html>
- ❖ Scholarships: The AHEC Office has agreed to oversee the repayment responsibilities for new JABSOM scholarships which require recipients to practice in Hawai'i after graduation. AHEC anticipates creating a medical school scholarship for a student who has excelled in the AHEC program through their pursuit of medical school and training.

Physician Retention

- ❖ Preceptor Tax Credit: AHEC is instrumental in implementing the Hawai'i Preceptor Tax Credit for preceptors offering professional instruction, training, and supervision to students and residents in medicine, advanced practice nursing, and pharmacy. The program began in 2019 and continues to grow in number of individuals who receive tax credit of up to \$5,000 a year for teaching medical, nurse practitioner and pharmacy students, with physicians receiving approximately 75% of the tax credits.

Table 7: Hawai'i Preceptor Tax Credits Awarded by Year

Year	2019	2020	2021	2022	2023	Cumulative
Preceptors	181	190	261	301	371	1,243
Tax Credits Awarded	371	378	587	645	676	2,657

From 2019 to 2023, the program gained 84 providers who had never engaged in precepting in the past and who completed some level of clinical rotation education in the calendar year. More information is available at:

<http://preceptortaxcredit.hawaii.edu/>.

- ❖ Physician Resiliency: Dr. Withy has held a monthly Balint group for providers interested in sharing about work stress in a safe environment. While individual organizations provide support groups, we are searching for additional resources for wellness support such that providers have access to free anonymous counseling support if needed through hawaiiutelehealth.org and other sources.
- ❖ Continuing Education: The 2024 Hawai'i Health Workforce Summit offered seven and a half hours of Continuing Education Credit to 784 participants at the Hawai'i Health Workforce Summit. The Summit addressed topics including Provider Well-Being, Administrative Supplementation, Interprofessional Team-Based Care Ideas, Geriatric Practice Expertise, Recognition and Treatment of Substance Use Disorder, Pediatric Mental Health and Rural Health Practice. The participant evaluation demonstrated a high level of satisfaction with the event and improvement in knowledge. Project ECHO provided 658 people with 4,980 people-hours of case-based education from in 2023, both in person and virtually. The ongoing ECHO distance learning clinics cover behavioral health, pediatrics and geriatrics and are overseen by Hawai'i State Rural Health Association.
- ❖ Home Purchase: Finally, to retain physicians, AHEC is working with economists, banks, donors, and investors to create methods for physicians and other healthcare workers to be able to purchase a home with a manageable mortgage. Four housing resources: MODEA through Hawai'i Housing Finance and Development Corporation, Maui Medical housing for healthcare workers on Maui, CMG Homeloans-a loan discount program that allows physicians to purchase with 5% down payment (Medproadvantage through CMGhomeloans) and <https://landed.com/> have been identified. In addition, research into the possibility of receiving donated or leasehold land for physicians to build on is ongoing.

Expand the Pathway to Health Careers

- ❖ Recruit the Future Physician Workforce: Very exciting things are happening in the recruitment of students into healthcare careers. The Health Sector Partnership is working with Hawai'i Pacific Health, Healthcare Association of Hawai'i and Hawai'i Department of Education, bringing together the industry to work with academia and

has created the capability for training certifications to be provided in high school so that students enter health careers as soon as they graduate high school. The areas of training include:

Table 8: Schools Providing Certificate Training

HAH Programs For 2024-2025 School Year

Model	Island	High School (participating school)	Training Program	In School / After School
Fall	Hawai'i	Honoka'a	Medical Assistant	In School
Fall	Hawai'i	Waiakea	Certified Nurse Aide	In School
Fall	Hawai'i	Hilo High	Certified Nurse Aide	In School
Spring	Hawai'i	Kealakehe (West Hawai'i Explorations Academy - 2 premier)	Certified Nurse Aide	In School
Spring	O'ahu	Mililani (Leilehua)	Certified Nurse Aide	After School
Spring	O'ahu	Farrington (McKinley and Kaimukī)	Certified Nurse Aide	After School
Spring	O'ahu	Kailua (Castle)	Phlebotomy	After School
Spring	O'ahu	Wai'anae	Patient Service Representative	In School
Spring	Kaua'i	Kaua'i	Certified Nurse Aide	After School
Summer	O'ahu	Farrington, McKinley, Kaimukī, Kailua and Castle	Certified Nurse Aide (summer)	n/a
Summer	Hawai'i	Kealakehe, Konawaena, Honoka'a, and Kohala	Certified Nurse Aide (summer)	n/a
Summer	Maui	Baldwin (Maui High)	Certified Nurse Aide (summer)	n/a

- ❖ The AHEC team has engaged over 4,000 health professions students in activities during 2024. Health career activities have been expanded to reach students on all neighboring islands. Through federal grant funding, AHEC provides mentoring, counseling support, and activities so that students from throughout Hawai'i can successfully pursue careers in the health professions. Participating AHEC students receive certification and training in Cardio Pulmonary Resuscitation (CPR), First Aid, Youth Mental Health First Aid, and Occupational Safety Administration procedures,

Health Information Portability and Accountability Act (HIPPA) procedures, as well as training in science, technology, engineering, and mathematics through real-life data acquisition, public speaking, leadership, research literacy, teamwork abilities, interview skills, professionalism, time management, and financial planning methods. The free PreHealth Career Corps program for students pursuing health careers now has over 4,500 students. More information is available at <https://ahec.hawaii.edu/students/phcc.html>. AHEC is also working with the Healthcare Association of Hawai'i to bolster non-physician health professions to lighten the load on the physicians by maximizing teamwork and collaboration and assisting with other University of Hawai'i programs and the Health Sector Partnership activities which increase students pursuing health careers.

- ❖ Teen Health Camps are day long events held on each island where students can learn about different health careers, talk to local health professions students and engage in hands on activities such as casting and suturing. The annual goal for student involvement is 500 students from across Hawai'i.
- ❖ Support for upskilling: AHEC makes a promise to any student in Hawai'i who wants to pursue a career or upskill in health careers to assist them. Through our PreHealth Career Corps and non-traditional student programs, we will help every step of the way. More info at: <https://www.ahec.hawaii.edu/programs-for-students/>
- ❖ Annual Teacher and Counselor Training Conferences are being introduced through a collaboration between AHEC, JABSOM Admissions and funded with a grant from the Hawai'i Department of Labor and Industrial Relations. Conferences on every island are being planned to alert teachers and counselors to all available resources and develop additional resources as needed.
- ❖ Expand Rural Training Opportunities: AHEC works with neighbor island communities to recruit additional preceptors to teach health professions students, recruit and support students interested in health careers, work with community members to host students, support travel and lodging for students to perform rural experiences and document the impact of rural activities on health professions training. The Chan-Zuckerburg Initiative is an exciting JABSOM program for six medical students a year to maximize training time on Kaua'i, receive full scholarships, and spend at least 4 years working on Kaua'i after residency. AHEC is working to expand resources on all islands by providing travel and housing for medical students to train throughout Hawai'i.

Next Steps

The Physician Workforce Research Team will continue to conduct the research and implement the solutions described above and will explore additional methods for healthcare reform that will improve work/life balance for physicians in Hawai'i. We look forward to YOUR input on ideas for expanding support for Hawai'i's current and future physician workforce.

More information on ongoing and upcoming activities is available at the AHEC website: www.ahec.hawaii.edu or call (808) 692-1060. Dr. Kelley Withy may be reached at (808) 692-1070 or via email withy@hawaii.edu.

Appendix 1: Physician Research Telephone Script

Please review each entry before calling. Physician offices may be busy, especially under current circumstances. You want to be prepared for any changes to data or sudden disruptions during the call. Among the various details we're confirming and updating, the most important are FTE, physician specialty, and zip code.

"Hi, I'm _____ with the UH Medical School Area Health Education Center doing physician workforce research."

(If they ask about our research: The purpose of this research is to identify where the largest shortages are so we can develop programs to recruit providers such as loan repayment.)

"I'm calling to see if Dr. _____ works here."

"Does Dr. _____ work full time?" (If they ask, full time is 40+ hours per week) (If NO) "How many hours at this office?"

"I wanted to confirm Dr. _____'s specialty. Is it **[insert found specialty]**?"

"I have the office/hospital **zip code** as _____. Is this correct?"

"Does s/he work at any **other clinic locations**?" (If YES) "Would you happen to have the location and/or phone number?" You'll call this second location to confirm FTE and other practice details. Some physicians may have more than two locations. Add any additional information to the 'Notes' column. Be sure to confirm FTE at every location you find.

"How many **other physicians** work at this location?" This is group size.

"Thank you very much for your time and for supporting our work!"

ALWAYS BE POLITE AND THANK THEM FOR THEIR TIME. If they have any further questions that you don't know the answers to, you can direct them to me. My email is withy@hawaii.edu, or they may call at 808-692-1070.

"I'm not sure, but I can give you the contact of my supervisor! The Area Health Education Center's Director is Kelley Withy, and you can reach her at **withy@hawaii.edu**.

If busy:

1. Would I be able to send an email or fax our survey?
2. Is there a better time to call back, or someone else available I can talk to?
3. Leave a voicemail with your name, the reason for your call, the best time to reach you, and your contact number. Repeat this a second time in case they didn't hear the first time. You may want to create your own voicemail script to help with leaving messages.

If the health professional doesn't work there anymore:

Would you happen to know if they moved practice locations, moved out of state, or retired?
(obtain new address if moved).

Appendix 2: Supply and Demand Tables Statewide and by County

Table 9: Statewide Supply and Demand Estimates by Primary Care

Specialty (Primary Care)	Demand	Supply	Shortage (without overages)	%Shortage++
Family Medicine	441.7	354.6	87.1	
General Internal Medicine	416.9	345	71.9	
Geriatric Medicine	31.1	43	0	
Pediatrics	234	228.9	5.1	
Primary Care Total	1123.7	971.5	152.2	13.5%

Table 10: Statewide Supply and Demand Estimates by Medical Specialties

Specialty (Medical Specialties)	Demand	Supply	Shortage (without overages)	%Shortage
Allergy & Immunology	20.7	10.8	9.9	47.8%
Dermatology	35.7	58.7	0	0.0%
Infectious Disease	39.7	22.2	17.5	44.1%
Neonatology	25.9	20.1	5.8	22.4%
Nephrology+	49.1	31.4	17.7	36.0%
Adult Cardiology	107.1	79.6	27.5	25.7%
Pediatric Cardiology	7.3	6.6	0.7	9.6%
Adult Critical Care+	40	36.7	3.3	8.2%
Pediatric Critical Care+	6	4.1	1.9	31.7%
Adult Endocrinology	28.8	11.5	17.3	60.1%
Pediatric Endocrinology	8	3.3	4.7	58.8%
Adult Gastroenterology	64.9	57.3	7.6	11.7%
Pediatric Gastroenterology	8.3	1.6	6.7	80.7%
Adult Hematology & Oncology	45.7	26.8	18.9	41.4%
Pediatric Hematology & Oncology	7.4	6.3	1.1	14.9%
Adult Pulmonary	59	25.3	33.7	57.1%
Pediatric Pulmonary	5.5	2	3.5	63.6%
Adult Rheumatology	23	15	8	34.8%
Pediatric Rheumatology	1.3	2.2	0	0.0%
Medical Specialties Total	583.4	421.5	185.8	31.8%

Table 11: Statewide Supply and Demand Estimates by Surgical Specialties

Specialty (Surgery)	Demand	Supply	Shortage (without overages)	%Shortage
Colorectal Surgery	11	4.9	6.1	55.5%
General Surgery	96.1	98.7	0	0.0%
Neurological Surgery+	15	14.7	0.3	2.0%
Obstetrics & Gynecology	165.7	177.4	0	0.0%
Ophthalmology	85.6	91.9	0	0.0%
Orthopedic Surgery+	92.3	82.8	9.5	10.3%
Otolaryngology	38.5	28.7	9.8	25.5%
Plastic Surgery	30.6	25.9	4.7	15.4%
Thoracic Surgery+	19	8.3	10.7	56.3%
Urology+	37.5	30.4	7.1	18.9%
Vascular Surgery+	21.1	18.5	2.6	12.3%
Surgery Total	612.4	582.2	50.8	8.3%

Table 12: Statewide Supply and Demand Estimates by Other Specialties

Specialty (Other)	Demand	Supply	Shortage (without overages)	%Shortage
Anesthesiology	177.9	152.7	29.2	16.4%
Emergency Medicine*	280.2	207	76.9	27.4%
Other Specialties***	150.1	109.8	41.2	27.4%
Pathology	65.7	37.3	28.4	43.2%
Physical Medicine & Rehabilitation	38	28	10	26.3%
Radiation Oncology	18.1	20.1	0.3	1.7%
Radiology	99.9	89.2	21.2	21.2%
Adult Neurology	53	47.4	9	17.0%
Pediatric Neurology	6.7	5	2.4	35.8%
Adult Psychiatry**	225.3	147	78.3	34.8%
Child/Adolescent Psychiatry**	68.9	36.2	32.7	47.5%
Other Specialties Total	1183.8	879.7	329.6	27.8%
Hospital Medicine	140.3	220.5	3.3	2.4%
Grand Total (Statewide)	3618	3075.4	768.4	21.2%

*Increase in ED demand to reflect non-resident increase in utilization on each island.

**Calculated 20.5 per 100,000 population divided between adult & pediatric specialists as indicated by the population-based IHS model.

***Other Specialties include: Concierge, Complimentary/Alternative Medicine, Medical Genetics, Occupational Medicine, Palliative Care, Pain Medicine, Preventive Medicine, Sleep Medicine, Urgent Care, and Wound Care.

+All residents should be within 60 minutes of care, so each island has at least 2 providers, and Hawai'i Island has a minimum of 4 providers. Each Level I-III Trauma Center has 5 ICU providers.

++Not calculated, as primary care can cover other primary care in most cases.

Table 13: Hawai'i County Physician Supply/Demand Estimates by Primary Care

Specialty (Primary Care)	Demand	Supply	Shortage (without overages)	%Shortage
Family Medicine	70.3	74.8	0	
General Internal Medicine	44.8	23.2	21.6	
Geriatric Medicine	2.4	1.5	0.9	
Pediatrics	28.4	26.9	1.5	
Primary Care Total	145.9	126.4	19.5	13.4%

Table 14: Hawai'i County Physician Supply/Demand Estimates Medical Specialties

Specialty (Medical Specialties)	Demand	Supply	Shortage (without overages)	%Shortage
Allergy & Immunology	2.2	0.9	1.3	59.1%
Dermatology	4.8	5.3	0	0.0%
Infectious Disease	5.6	1.3	4.3	76.8%
Neonatology	4	0	4	100.0%
Nephrology+	6.8	3	3.8	55.9%
Adult Cardiology	14.2	10.4	3.8	26.8%
Pediatric Cardiology	0.7	0.5	0.2	28.6%
Adult Critical Care+	10	0	10	100.0%
Pediatric Critical Care	0.4	0	0.4	100.0%
Adult Endocrinology	3.2	0.1	3.1	96.9%
Pediatric Endocrinology	1.2	0	1.2	100.0%
Adult Gastroenterology	7.1	3.7	3.4	47.9%
Pediatric gastroenterology	0.5	0	0.5	100.0%
Adult Hematology & Oncology	6.2	1	5.2	83.9%
Pediatric Hematology & Oncology	0.9	0	0.9	100.0%
Adult Pulmonary	6.8	0.2	6.6	97.1%
Pediatric Pulmonary	0.4	0	0.4	100.0%
Adult Rheumatology	3	1.3	1.7	56.7%
Pediatric Rheumatology	0.2	0	0.2	100.0%
Medical Specialties Total	78.2	27.7	51	65.2%

Table 15: Hawai'i County Physician Supply/Demand Estimates Surgical Specialties

Specialty (Surgery)	Demand	Supply	Shortage (without overages)	%Shortage
Colorectal Surgery	1.7	0.3	1.4	82.4%
General Surgery	17.6	12.5	5.1	29.0%
Neurological Surgery+	2	0.1	1.9	95.0%
Obstetrics & Gynecology	21.3	20.4	0.9	4.2%
Ophthalmology	13.1	4	9.1	69.5%
Orthopedic Surgery+	14.6	10.1	4.5	30.8%
Otolaryngology	5.2	1	4.2	80.8%
Plastic Surgery	4.1	1.5	2.6	63.4%
Thoracic Surgery+	2.1	0	2.1	100.0%
Urology+	5.3	1.5	3.8	71.7%
Vascular Surgery+	3.2	2.7	0.5	15.6%
Surgery Total	90.2	54.1	36.1	40.0%

Table 16: Hawai'i County Physician Supply and Demand Estimates-Other Specialties

Specialty (Other)	Demand	Supply	Shortage (without overages)	%Shortage
Anesthesiology	26.4	6.1	20.3	76.9%
Emergency Medicine*	38.4	33	5.4	14.1%
Other Specialties***	20.7	14.8	5.9	28.5%
Pathology	9.6	3	6.6	68.8%
Physical Medicine & Rehabilitation	7.5	1.3	6.2	82.7%
Radiation Oncology	2.4	2.4	0	0.0%
Radiology	17.9	6.3	11.6	64.8%
Adult Neurology	6.3	1.1	5.2	82.5%
Pediatric Neurology	0.9	0	0.9	100.0%
Adult Psychiatry**	36.9	11.7	25.2	68.3%
Child/Adolescent Psychiatry**	5.7	1.6	4.1	71.9%
Other Specialties Total	172.7	81.3	94.1	52.9%
Hospital Medicine	20.5	17.2	3.3	16.1%
Grand Total (Hawai'i County)	499.9	306.7	201.3	40.3%

*Increase in ED demand to reflect non-resident increase in utilization on each island.

**Calculated 20.5 per 100,000 population divided between adult & pediatric specialists as indicated by the population-based IHS model.

***Other Specialties include: Concierge, Complimentary/Alternative Medicine, Medical Genetics, Occupational Medicine, Palliative Care, Pain Medicine, Preventive Medicine, Sleep Medicine, Urgent Care, and Wound Care.

+All residents should be within 60 minutes of care, so each island has at least 2 providers, and Hawai'i Island has a minimum of 4 providers. Each Level I-III Trauma Center has 5 ICU providers.

++Not calculated, as primary care can cover other primary care in most cases.

Table 17: Honolulu County Supply and Demand Estimates by Primary Care

Specialty (Primary Care)	Demand	Supply	Shortage (without overages)	%Shortage++
Family Medicine	293.3	226	67.3	
General Internal Medicine	315.8	279.3	36.5	
Geriatric Medicine	22.1	38.5	0	
Pediatrics	169.9	171.1	0	
Primary Care Total	801.1	714.9	86.2	10.8%

Table 18: Honolulu County Supply and Demand Estimates by Medical Specialties

Specialty (Medical Specialties)	Demand	Supply	Shortage (without overages)	%Shortage
Allergy & Immunology	15	9.8	5.2	34.7%
Dermatology	24	47	0	0.0%
Infectious Disease	27.5	18.4	9.1	33.1%
Neonatology	17.7	20.1	0	0.0%
Nephrology+	34.7	26.4	8.3	23.9%
Adult Cardiology	75	59.3	15.7	20.9%
Pediatric Cardiology	5.6	6	0	0.0%
Adult Critical Care+	20	31.7	0	0.0%
Pediatric Critical Care	5	4.1	0.9	18.0%
Adult Endocrinology	21.1	10.8	10.3	48.8%
Pediatric Endocrinology	5.3	3.3	2	37.7%
Adult Gastroenterology	47.4	50.8	0	0.0%
Pediatric Gastroenterology	6.8	1.6	5.2	76.5%
Adult Hematology & Oncology	29.8	22.7	7.1	23.8%
Pediatric Hematology & Oncology	5.6	6.3	0	0.0%
Adult Pulmonary	42.5	22.4	20.1	47.3%
Pediatric Pulmonary	4.3	2	2.3	53.5%
Adult Rheumatology	16.2	13.4	2.8	17.3%
Pediatric Rheumatology	0.9	2.2	0	0.0%
Medical Specialties Total	404.4	358.3	89	22.0%

Table 19: Honolulu County Supply and Demand Estimates by Surgical Specialties

Specialty (Surgery)	Demand	Supply	Shortage (without overages)	%Shortage
Colorectal Surgery	7.3	4.5	2.8	38.4%
General Surgery	60.6	70.2	0	0.0%
Neurological Surgery+	9	14.2	0	0.0%
Obstetrics & Gynecology	117.4	130.1	0	0.0%
Ophthalmology	58.5	78.3	0	0.0%
Orthopedic Surgery+	60.2	59.2	1	1.7%
Otolaryngology	25.4	21.9	3.5	13.8%
Plastic Surgery	19.5	21.3	0	0.0%
Thoracic Surgery+	12.5	7.3	5.2	41.6%
Urology+	25.4	25.3	0.1	0.4%
Vascular Surgery+	13.6	13.5	0.1	0.7%
Surgery Total	409.4	445.8	12.7	3.1%

Table 20: Honolulu County Supply and Demand Estimates by Other Specialties

Specialty (Other)	Demand	Supply	Shortage (without overages)	%Shortage
Anesthesiology	119.9	116.8	3.1	2.6%
Emergency Medicine*	197.9	140.1	57.8	29.2%
Other Specialties***	104.5	77.2	27.3	26.1%
Pathology	45.1	31.8	13.3	29.5%
Physical Medicine & Rehabilitation	24.9	23.7	1.2	4.8%
Radiation Oncology	12.1	13.9	0	0.0%
Radiology	62.7	73.2	0	0.0%
Adult Neurology	38.5	41.9	0	0.0%
Pediatric Neurology	4.3	5	0	0.0%
Adult Psychiatry**	151.5	117.2	34.3	22.6%
Child/Adolescent Psychiatry**	51.3	32	19.3	37.6%
Other Specialties Total	812.7	672.8	139.9	17.2%
Hospital Medicine#	96.3	178.5	0	0.0%
Grand Total (Statewide)	2512.2	2370.3	327.8	13.0%

*Increase in ED demand to reflect non-resident increase in utilization on each island.

**Calculated 20.5 per 100,000 population divided between adult & pediatric specialists as indicated by the population-based IHS model.

***Other Specialties include: Concierge, Complimentary/Alternative Medicine, Medical Genetics, Occupational Medicine, Palliative Care, Pain Medicine, Preventive Medicine, Sleep Medicine, Urgent Care, and Wound Care.

+All residents should be within 60 minutes of care, so each island has at least 2 providers, and Hawai'i Island has a minimum of 4 providers. Each Level I-III Trauma Center has 5 ICU providers.

++Not calculated, as primary care can cover other primary care in most cases.

Table 21: Kaua'i County Supply and Demand Estimates by Primary Care

Specialty (Primary Care)	Demand	Supply	Shortage (without overages)	%Shortage++
Family Medicine	24.3	20.7	3.6	
General Internal Medicine	15.5	13.1	2.4	
Geriatric Medicine	0.8	3	0	
Pediatrics	9.8	7.6	2.2	
Primary Care Total	50.4	44.4	6	11.9%

Table 22: Kaua'i County Supply and Demand Estimates by Medical Specialties

Specialty (Medical Specialties)	Demand	Supply	Shortage (without overages)	%Shortage
Allergy & Immunology	0.7	0.1	0.6	85.7%
Dermatology	1.6	0.8	0.8	50.0%
Infectious Disease	1.9	1.5	0.4	21.1%
Neonatology	1.4	0	1.4	100.0%
Nephrology+	2.4	0	2.4	100.0%
Adult Cardiology	4.8	2	2.8	58.3%
Pediatric Cardiology	0.2	0	0.2	100.0%
Adult Critical Care+	5	0	5	100.0%
Pediatric Critical Care	0.3	0	0.3	100.0%
Adult Endocrinology	1.1	0	1.1	100.0%
Pediatric Endocrinology	0.4	0	0.4	100.0%
Adult Gastroenterology	2.5	1.8	0.7	28.0%
Pediatric Gastroenterology	0.2	0	0.2	100.0%
Adult Hematology & Oncology	2	1.1	0.9	45.0%
Pediatric Hematology & Oncology	0.3	0	0.3	100.0%
Adult Pulmonary	2.2	1	1.2	54.5%
Pediatric Pulmonary	0.2	0	0.2	100.0%
Adult Rheumatology	1.1	0.1	1	90.9%
Pediatric Rheumatology	0.1	0	0.1	100.0%
Medical Specialties Total	28.4	8.4	20	70.4%

Table 23: Kaua'i County Supply and Demand Estimates by Surgical Specialties

Specialty (Surgery)	Demand	Supply	Shortage (without overages)	%Shortage
Colorectal Surgery	0.6	0.1	0.5	83.3%
General Surgery	6	6.3	0	0.0%
Neurological Surgery+	2	0	2	100.0%
Obstetrics & Gynecology	7.4	6.7	0.7	9.5%
Ophthalmology	4.5	4.3	0.2	4.4%
Orthopedic Surgery+	5.1	4	1.1	21.6%
Otolaryngology	1.8	2.5	0	0.0%
Plastic Surgery	1.3	0	1.3	100.0%
Thoracic Surgery+	2	0	2	100.0%
Urology+	2	1.6	0.4	20.0%
Vascular Surgery+	2	0.3	1.7	85.0%
Surgery Total	34.7	25.8	9.9	28.5%

Table 24: Kaua'i County Supply and Demand Estimates by Other Specialties

Specialty (Other)	Demand	Supply	Shortage (without overages)	%Shortage
Anesthesiology	9	13	0	0.0%
Emergency Medicine*	14	17.7	0	0.0%
Other Specialties***	7.1	10.4	0	0.0%
Pathology	3.3	0.5	2.8	84.8%
Physical Medicine & Rehabilitation	2.5	1	1.5	60.0%
Radiation Oncology	0.8	1.3	0	0.0%
Radiology	5.9	4.4	1.5	25.4%
Adult Neurology	2.2	1	1.2	54.5%
Pediatric Neurology	0.3	0	0.3	100.0%
Adult Psychiatry**	13	5.2	7.8	60.0%
Child/Adolescent Psychiatry**	2.1	0.8	1.3	61.9%
Other Specialties Total	60.2	52.9	7.3	12.1%
Hospital Medicine	7	7.3	0	0.0%
Grand Total (Kaua'i County)	177.4	138.8	43.2	24.4%

*Increase in ED demand to reflect non-resident increase in utilization on each island.

**Calculated 20.5 per 100,000 population divided between adult & pediatric specialists as indicated by the population-based IHS model.

***Other Specialties include: Concierge, Complimentary/Alternative Medicine, Medical Genetics, Occupational Medicine, Palliative Care, Pain Medicine, Preventive Medicine, Sleep Medicine, Urgent Care, and Wound Care.

+All residents should be within 60 minutes of care, so each island has at least 2 providers, and Hawai'i Island has a minimum of 4 providers. Each Level I-III Trauma Center has 5 ICU providers.

++ Not calculated, as primary care can cover other primary care in most cases.

Table 25: Maui County Supply and Demand Estimates by Primary Care

Specialty (Primary Care)	Demand	Supply	Shortage (without overages)	%Shortage++
Family Medicine	53.8	33.1	20.7	
General Internal Medicine	40.8	29.4	11.4	
Geriatric Medicine	5.8	0	5.8	
Pediatrics	25.9	23.3	2.6	
Primary Care Total	126.3	85.8	40.5	32.1%

Table 26: Maui County Supply and Demand Estimates by Medical Specialties

Specialty (Medical Specialties)	Demand	Supply	Shortage (without overages)	%Shortage
Allergy & Immunology	2.8	0	2.8	100.0%
Dermatology	5.3	5.6	0	0.0%
Infectious Disease	4.7	1	3.7	78.7%
Neonatology	2.8	0	2.8	100.0%
Nephrology+	5.2	2	3.2	61.5%
Adult Cardiology	13.1	7.9	5.2	39.7%
Pediatric Cardiology	0.8	0.1	0.7	87.5%
Adult Critical Care+	5	5	0	0.0%
Pediatric Critical Care	0.3	0	0.3	100.0%
Adult Endocrinology	3.4	0.6	2.8	82.4%
Pediatric Endocrinology	1.1	0	1.1	100.0%
Adult Gastroenterology	7.9	1	6.9	87.3%
Pediatric Gastroenterology	0.9	0	0.9	100.0%
Adult Hematology & Oncology	7.7	2	5.7	74.0%
Pediatric Hematology & Oncology	0.6	0	0.6	100.0%
Adult Pulmonary	7.5	1.7	5.8	77.3%
Pediatric Pulmonary	0.6	0	0.6	100.0%
Adult Rheumatology	2.7	0.2	2.5	92.6%
Pediatric Rheumatology	0.1	0	0.1	100.0%
Medical Specialties Total	72.5	27.1	45.7	63.0%

Table 27: Maui County Supply and Demand Estimates by Surgical Specialties

Specialty (Surgery)	Demand	Supply	Shortage (without overages)	%Shortage
Colorectal Surgery	1.4	0	1.4	100.0%
General Surgery	11.9	9.7	2.2	18.5%
Neurological Surgery+	2	0.4	1.6	80.0%
Obstetrics & Gynecology	19.6	20.2	0	0.0%
Ophthalmology	9.5	5.3	4.2	44.2%
Orthopedic Surgery+	12.4	9.5	2.9	23.4%
Otolaryngology	6.1	3.3	2.8	45.9%
Plastic Surgery	5.7	3.1	2.6	45.6%
Thoracic Surgery+	2.4	1	1.4	58.3%
Urology+	4.8	2	2.8	58.3%
Vascular Surgery+	2.3	2	0.3	13.0%
Surgery Total	78.1	56.5	22.2	28.4%

Table 28: Maui County Supply and Demand Estimates by Other Specialties

Specialty (Other)	Demand	Supply	Shortage (without overages)	%Shortage
Anesthesiology	22.6	16.8	5.8	25.7%
Emergency Medicine*	29.9	16.2	13.7	45.8%
Other Specialties***	17.8	9.8	8	44.9%
Pathology	7.7	2	5.7	74.0%
Physical Medicine & Rehabilitation	3.1	2	1.1	35.5%
Radiation Oncology	2.8	2.5	0.3	10.7%
Radiology	13.4	5.3	8.1	60.4%
Adult Neurology	6	3.4	2.6	43.3%
Pediatric Neurology	1.2	0	1.2	100.0%
Adult Psychiatry**	23.9	12.9	11	46.0%
Child/Adolescent Psychiatry**	9.8	1.8	8	81.6%
Other Specialties Total	138.2	72.7	65.5	47.4%
Hospital Medicine	16.5	17.5	0	0.0%
Grand Total (Maui County)	428.6	259.6	173.9	40.6%

*Increase in ED demand to reflect non-resident increase in utilization on each island.

**Calculated 20.5 per 100,000 population divided between adult & pediatric specialists as indicated by the population-based IHS model.

***Other Specialties include: Concierge, Complimentary/Alternative Medicine, Medical Genetics, Occupational Medicine, Palliative Care,

Pain Medicine, Preventive Medicine, Sleep Medicine, Urgent Care, and Wound Care.

+All residents should be within 60 minutes of care, so each island has at least 2 providers, and Hawai'i Island has a minimum of 4 providers. Each Level I-III Trauma Center has 5 ICU providers.

++ Not calculated, as primary care can cover other primary care in most cases.

Appendix 3: Data Crosswalk

How different specialties are counted is outlined below in the Specialty Crosswalk.

Table 29: Hawai'i Physician Workforce Specialty Crosswalk

Primary Care	
Family Medicine	General Practice Sports Medicine Family Medicine
General Internal Medicine	
Geriatrics	Geriatrics Geri Hospitalist
Pediatrics	Med-Peds Adolescent med, Pediatrics other
Medical Specialties	
Allergy & Immunology	
Dermatology	
Infectious Diseases	
Neonatology	
Nephrology	nephrology, peds nephrology
Adult Cardiology	
Child Cardiology	
Adult Critical Care	Critical Care Neuro Crit Care
Child Critical Care	Peds Crit Care
Adult Endocrinology	
Child Endocrinology	
Adult Gastroenterology	
Child Gastroenterology	
Adult Hematology & Oncology	
Child Hematology & Oncology	
Adult Pulmonology	
Child Pulmonology	
Adult Rheumatology	
Child Rheumatology	
Surgery	
Colorectal Surgery	
General Surgery	General Surgery Surgical Critical Care Surgery, Other Surgical Oncology
Neurological Surgery	

Obstetrics & Gynecology	Gynecology (only) Gyn Onc OBGYN Perinatology (Maternal-Fetal Med) Reproductive Endo
Ophthalmology	
Orthopedic Surgery	Orthopedic Surgery Hand Surgery
Otolaryngology	
Plastic Surgery	
Thoracic Surgery	
Urology	Urology, pediatric urology
Vascular Surgery	
Other	
Anesthesiology	
Emergency Medicine	
Pathology	
Physical Medicine & Rehabilitation	PMR
Radiation Oncology	rad onc, nuclear med
Radiology	Diagnostic Radiology Interventional (Therapeutic) Radiology Neuroradiology
Other Specialties	Other Concierge Complimentary/Alternative Medicine Occupational Palliative Pain Medicine Preventive Medicine Sleep Urgent Care Medical Genetics Wound Care oral-maxillary surgery
Adult Neurology	
Child Neurology	
Adult Psychiatry	Adult Psych Addiction Psych Psych Geri Psych Psych Hospitalist
Child Psychiatry	Child & Adolescent
Hospitalist	Peds hospitalist, hospitalist