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## Guest Editors' Message: Hawai'i's Healthcare Workforce

Deborah B Gardner PhD, RN; Kira Hughes MS; and Kelley Withy MD, PhD

The Health Workforce Special Edition of the Hawai'i Journal of Medicine and Public Health highlights research on the growing challenges facing the healthcare workforce in Hawai'i. It features the most current and comprehensive information on Hawai'i's workforce supply and projected shortages to date for physicians and for the Public Health workforce, as well as provides insight into the Mental Health Workforce.

*Establishing Successful Patient-Centered Medical Homes in Rural Hawai'i: Three Strategies to Consider* reviews the challenges of establishing the medical home as posed by Hawai'i's unique geography, physician shortages, and dispersed population. The results of this qualitative study recommend three paths towards the effective implementation of the patient-centered medical home in Hawai'i.

*Identifying Barriers in the Use of Electronic Health Records in Hawai'i* examines the current state of EHR in Hawai'i, the barriers to adoption, and the future of Health Information Technology (HIT) initiatives to improve the health of Hawai'i's people.

*Comparison of Primary Care Physician Reimbursement Rates in the US* demonstrates how Hawai'i providers are reimbursed significantly lower than doctors in cities with similar cost of living by both Medicare and private insurance. Ideas such as making use of the 10% Medicare Bonus Program for physicians working in Health Professions Shortage Areas are offered for increasing physician payment.

*Beyond the Ability to Pay: The Health Status of Native Hawaiians and Other Pacific Islanders in Relationship to Health Insurance* offers insights into the unique issues the healthcare system will need to address to improve the health of Native Hawaiians and Other Pacific Islanders (NHOPI).

The final section of this edition provides insights and recommendations from those working toward becoming healthcare providers in Hawai'i, as well as a book review regarding the health issues that face women in military service.

We know this is a difficult time to be in healthcare. There are so many things changing, so many new requirements, and so many unknowns. But some things remain constant: the importance of the healing professions, the caring we have for and by our patients, and the central role we play in the lives of so many. So we want to offer insights into preventing burn out in case they come in handy for you. First of all, it can't all be done from inside only. Yes, we can all pay more attention to our needs, make more time for family and fun and take better care of ourselves. But it also depends on employers and insurers making some effort to acknowledge the work that healthcare providers put in, especially primary care providers. Despite lower pay than specialists, and possibly longer work days, primary care providers are essential to an effective and efficient health care system. It should also be acknowledged that electronic health records do not save time and so far cause more frustration and expense than they save. So, until these things are improved, we have some permissions for you:

- Permission to say "No"
- Permission to put family or fun first sometimes
- Permission to take a vacation
- Permission to NOT delay gratification once in a while
- Permission to brag about the things you have done to help people

And most of all, we want to thank you for caring for the patients of Hawai'i! We hope you enjoy this Workforce Edition! The Area Health Education Center (AHEC) regularly hosts focus groups and meetings to plan for countering the workforce shortages, so your feedback and involvement is always welcome. More information is available at <http://www.ahec.hawaii.edu/workforce>. Please contact Dr. Kelley Withy (withy@hawaii.edu) with any thoughts and comments. Mahalo!



# Hawai'i Physician Workforce Assessment 2016: Improvement in Physician Numbers but Physician Suicides of Concern

Kelley Withy MD, PhD; Priscilla Mapelli BA; John Perez; Ariel Finberg BS; and Josh Green MD

## Abstract

*Hawai'i's Physician Workforce Assessment project was launched in 2010. Over the past 5 years the State has experienced decreases and increases in physician workforce. This current article describes the status of the physician workforce, past trends and anticipated projections as well as recent insights into why people leave Hawai'i. Survey data, internet searches and direct dialing methodologies were utilized to clarify and elucidate practice location, full time equivalency of time providing patient care and specialty of non-military physicians caring for Hawai'i's population. A proprietary microsimulation modeling methodology from the company the US Health Resources and Services Administration employs is utilized to assess demand. The current shortage of physicians is estimated to be between 455 and 707 full time equivalents with the greatest percentage of shortages on neighbor islands. Numerically the greatest total shortage of physicians is on O'ahu and the specialty in greatest demand is primary care with a shortage of 228 Full Time Equivalents (FTEs). Physician average age in Hawai'i is 54.9 compared to a national average of 51. There was an increase in the number of physicians who report using telehealth, from 2% to 15%.*

*Initial improvements in the size of Hawai'i's physician workforce are promising, but we note two reported suicides in the intervening year. More attention must be paid to support practicing physicians in addition to our efforts to recruit new physicians.*

## Keywords

Physician workforce, physician shortage, physician suicide

## Introduction

Nationwide estimates of physician demand indicate that there is a current shortage of 25,000 to 35,000 physicians in the United States (US) and an anticipated shortage of 61,700 to 94,700 will occur by 2025 if intervening measures aren't taken.<sup>1</sup> Increasingly complex administrative burdens, electronic medical record incompatibilities, payment penalties, formulary changes, prior authorization rejections, requirements to see more patients, an increased number of billing codes, and in addition to the standard life and death responsibilities that occur in medical practice, are creating a climate of growing frustration in the physician community. As a result, more than half of physicians report being 'burned out' and US statistics indicate that between 300 and 400 physicians commit suicide every year.<sup>2,3</sup>

As an island state, Hawai'i's ability to recruit physicians is more challenging than in the contiguous states of the US. Until five years ago, Hawai'i was unable to quantify its practicing physician ranks or true shortage numbers. Past Hawai'i Physicians Workforce reports estimated the physician shortage to be 742 in 2013<sup>4</sup> and estimates of 2020 shortage have been as high as 800 and 1500 physicians.<sup>5</sup> This article describes the continued assessment of the physician workforce in the state of Hawai'i at this time.

## Methods

The estimated supply of physicians in Hawai'i is based on the voluntary responses of physicians to an electronic survey administered at the time of state medical license renewal for physicians who relicense online. If physicians don't license online, or they don't answer the survey, then the survey results are supplemented with queries of local community contacts, internet searches and direct calling of physician offices to confirm location, hours of active patient care and specialty. Questions asked on the 2015 re-licensure survey are included in Table 1.

The demand for physician services is estimated using a model purchased from IHS Global in 2014. IHS Global created a statistical model of each county of Hawai'i based on age, gender, ethnicity mix and health indicators. This model uses data from multiple national data sets to estimate the number of services utilized by a specific population of similar size, age, gender, ethnicity, health and insurance status to the county population. This allows for estimates of physician full time equivalents (FTEs) each county would utilize based on average US utilization of services for the population of that county of Hawai'i.

A modification to the demand model database was made to include Hawai'i's geographic differences compared with the mainland. Two specialties, Emergency Medicine and Critical Care, were adjusted such that there were five of each specialty for each neighbor island hospital using the estimated number of staff needed for around the clock service. Furthermore, because Psychiatry is an area with multiple anecdotal reports of unmet demand, the estimates are increased from the 50<sup>th</sup> percentile to 75<sup>th</sup> percentile in the demand model, and when the calculated supply number exceeds demand number, as on O'ahu, the supply number is utilized as the demand number.

Also of note is the absence of a demand category for hospitalists, because it is a newer specialty. Therefore specialties in the "Other" category include hospitalist, pediatric hospitalist, occupational medicine, sleep medicine, complementary and alternative medicine, pain medicine, preventive medicine and radiation oncology. These specialties are represented in the total supply numbers, but not specifically broken down by specialty specific supply/demand.

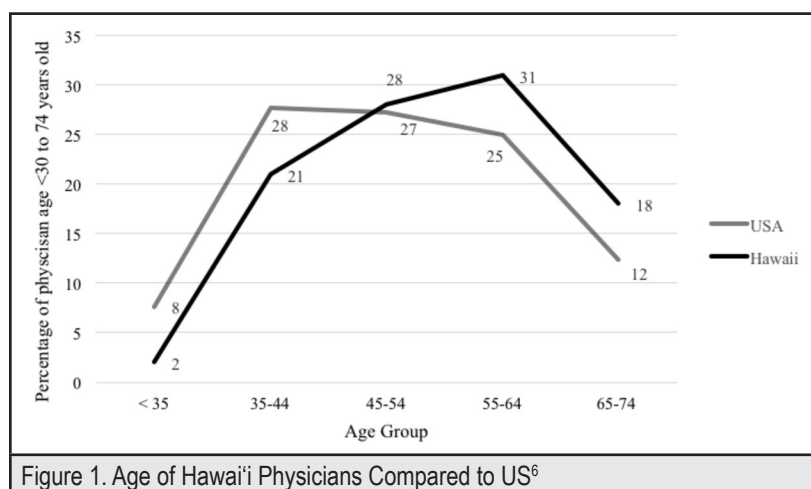
## Results

As of August 1, 2016, there were 8,900 physicians licensed in Hawai'i. Of those, 6,600 answered the online survey and 2,833 reported active practice during the November 2015 to January 2017 licensure cycle. Another 860 were found to be practicing through telephone follow up of new and existing licensees for a total of 3,693 physicians.<sup>6</sup> All report practicing at least 1 hour

Table 1. 2015 Physician Workforce Survey Questions		
1.	Do you provide healthcare to patients in Hawai'i?	Yes No If no, please skip to next page
2.	Do you primarily serve a military or military dependent population?	Yes No
3.	Are you still in training (internship, residency or fellowship)?	Yes No
4.	Are you primarily a hospital based physician? (Anesthesia, Emergency, Hospitalist, etc)?	Yes No
5.	What specialty/specialties do you practice?	
6.	Please tell us about your primary practice environment:	a. Address 1 (Office or Hospital):
		b. City
		c. State
		d. Zip code
		e. Phone number
		f. Email
		g. Hours per week you see patients at this address
	If you have more than one practice, please provide information for your second address:	a. Address 2 (Office or Hospital):
		b. City
		c. State
		d. Zip code
		e. Phone number
		f. Email
		g. Hours per week you see patients at this address
7.	Do you have more than 2 practice sites in Hawai'i?	Yes No If yes, how many?
8.	Is a majority of your income a result of being employed by a medical group, hospital, school (faculty) or other entity?	Yes No Name of entity:
9.	What is the size of your practice group (how many partners do you have including yourself)?	1-2 3-5 6-10 11 or more
10.	Do you provide care to Hawai'i patients via telemedicine?	Yes No

a week, providing patient care to patients in Hawai'i (including by telehealth). The total of physician full time equivalents found caring for Hawai'i patients (when the hours of practice were calculated, considering maximum full time work at 40 hours a week) totaled: 2,903 FTEs of practicing physicians.

Of the physicians practicing in Hawai'i at least 1 hour a week, 32% are female. Average age is 54.9 compared to US average age of 51.<sup>7</sup> The youngest practicing physician in Hawai'i is 29, the oldest is 90 years old. Across the United States, 11% of practicing physicians are between the ages of 65 to 75,<sup>8</sup> but in Hawai'i, 18% of our physicians are aged 65 to 75 and 3% of our active physicians are over 75 years of age. Across the US, nearly 26% are between age 55 and 64, compared to Hawai'i, where 31% are in that age group. Therefore, 52% of Hawai'i's physicians will be 65 or over within 10 years. See Figure 1.





Of the 2,846 physicians who answered the survey questions regarding practice in Hawai'i, 56% reported being employed and 54% reported working in groups of five or less (down from 58% two years ago). See Table 2.

A total of 435 active providers report practicing telehealth or 15% of providers. Specialties that use telehealth are diverse and include most of the medical specialties in Hawai'i. Specialties that employ telehealth more than others are Primary Care, Radiology and Psychiatry.

The IHS demand model indicates that statewide, the total number of physicians needed to provide the average services seen across the US for physician visits is 3358 FTEs. When the statewide number of physician FTEs compared to the US average physician population is calculated, the shortage is 455 FTEs. When geographic differences are taken into account the shortage is 487 FTEs. When island specific overages in supply by individual specialties are excluded from the calculations (for example if there are more of a certain specialty of physicians calculated in the demand model for an island the excess is zeroed out) the shortage of physicians in Hawai'i is 707 FTEs.

Projections of future supply needs are difficult to assess as there are no clear trends based on the six years of data available. Figure 2 represents a contraction of the workforce shortage if we continue to gain 100 physicians a year. If this occurs, we will only have a shortage of 293 physicians in 2020. However, if we revert to prior year status of no growth in the physician workforce, in 2020 our shortage will be 681 as seen in Figure 3.<sup>6</sup>

The shortages in greatest demand by county are represented in Table 3 below. The table illustrates both the specialties with the greatest percentage shortages and those with the greatest number of unmet needs. In many cases, one physician moving to a rural area will meet the need for that specialty in that area. Similarly, one specialty physician leaving can put that rural area in jeopardy of not having necessary services.

The latest statistics for each of the specialties except "Other" are included in Tables 4-7.<sup>6</sup> The supply and demand numbers are listed as FTEs, and the percent of shortage is included for each county of Hawai'i.

Table 2. Distribution of Group Size of Hawai'i Physicians<sup>6</sup>

Group Size	1-2	3-5	6-10	Over 10
Percent of Physicians	39%	15%	10%	36%

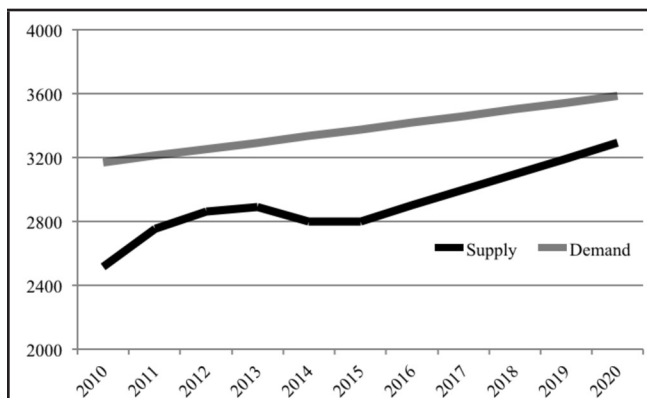


Figure 2. Hawai'i Physician Supply and Demand Estimates with Gain of 100 Physicians a Year

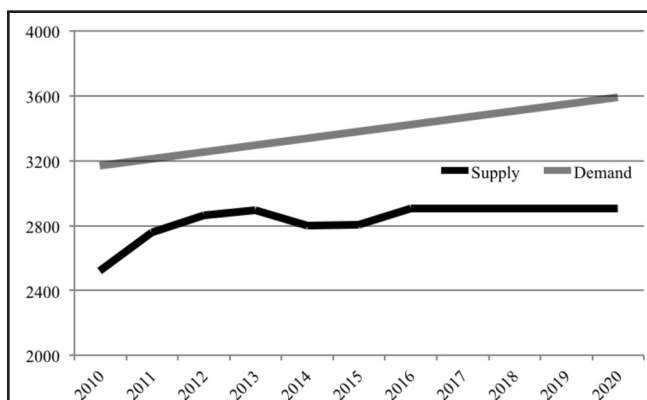


Figure 3. Hawai'i Physician Supply and Demand Estimates with No Gain of Physicians Annually<sup>6</sup>

Table 3. Largest Shortages of Physicians by Percentage and by Numbers of Providers by County

County	O'ahu	Maui	Kaua'i	Hawai'i
Specialties with Greatest Percentage Shortages	Infectious Disease, Pathology, General Surgery	Allergy, Colorectal, Neurosurgery	Endocrinology, Rheumatology, Infectious Disease, Critical Care, Neonatal, Neurology	Infectious Disease, Neonatology, Colorectal Surgery
Specialties with Greatest Shortage by Full Time Equivalents	Primary care, General Surgery, Pathology	Primary Care, Emergency Medicine, Psychiatry	Primary Care, Obstetrics, Cardiology, Neurology	Primary Care, Anesthesiology, Cardiology, Orthopedic, Pathology

Table 4. Supply and Demand by Specialty for Hawai'i County <sup>6</sup>				
2016 County Statistics	Hawai'i Demand	Hawai'i Supply	Hawai'i Shortage	Percent Shortage
Primary Care	180	143	36	20%
Allergy & Immunology	3	1	2	72%
Anesthesiology	24	13	12	48%
Cardiology	16	6	11	66%
Colorectal Surgery	1	0	1	100%
Critical Care	10*	1	3	87%
Dermatology	7	4	3	42%
Emergency Medicine	32	29	3	10%
Endocrinology	4	1	3	79%
Gastroenterology	9	6	4	39%
General Surgery	17	8	9	54%
Hematology & Oncology	10	3	6	65%
Infectious Disease	6	0	6	100%
Neonatal-perinatal	3	0	3	100%
Nephrology	5	4	1	14%
Neurological Surgery	3	0	3	93%
Neurology	11	2	8	78%
OBGYN	26	18	8	31%
Ophthalmology	12	7	5	43%
Orthopedic Surgery	15	6	10	62%
Otolaryngology	6	3	3	48%
Pathology	12	3	10	80%
Physical Medicine and Rehabilitation	5	2	3	63%
Plastic Surgery	5	2	3	65%
Psychiatry	28	24	4	14%
Pulmonology	8	1	7	87%
Radiology	21	14	7	32%
Rheumatology	3	2	1	46%
Thoracic Surgery	3	0	3	91%
Urology	7	1	5	82%
Vascular Surgery	2	3	0	0%
Other category excluded				

Table 5. Supply and Demand by Specialty for Maui County <sup>6</sup>				
2016 County Statistics	Maui Demand	Maui Supply	Maui Shortage	Percent Shortage
Primary Care	147	112	34	23%
Allergy & Immunology	2	0	2	100%
Anesthesiology	20	17	3	13%
Cardiology	13	11	2	12%
Colorectal Surgery	1	0	1	100%
Critical Care	5*	3	0	13%
Dermatology	5	8	0	0%
Emergency Medicine	26	15	11	43%
Endocrinology	3	1	2	63%
Gastroenterology	7	5	2	33%
General Surgery	14	5	9	63%
Hematology & Oncology	8	5	3	36%
Infectious Disease	5	1	4	87%
Neonatal-perinatal	3	0	2	92%
Nephrology	4	4	0	1%
Neurological Surgery	2	0	2	94%
Neurology	9	6	3	38%
OBGYN	21	16	5	25%
Ophthalmology	10	7	3	28%
Orthopedic Surgery	13	8	5	38%
Otolaryngology	5	5	1	10%
Pathology	10	2	8	79%
Physical Medicine and Rehabilitation	4	3	1	28%
Plastic Surgery	4	2	2	54%
Psychiatry	23	13	10	45%
Pulmonology	6	2	4	68%
Radiology	16	17	0	0%
Rheumatology	2	0	2	88%
Thoracic Surgery	2	1	1	53%
Urology	5	3	2	43%
Vascular Surgery	1	1	1	46%
Other category excluded				

Table 6. Supply and Demand by Specialty for Kaua'i County <sup>6</sup>				
2016 County Statistics	Kaua'i Demand	Kaua'i Supply	Kaua'i Shortage	Percent Shortage
Primary Care	63	48	16	25%
Allergy & Immunology	1	0	1	80%
Anesthesiology	9	9	0	0%
Cardiology	6	2	4	71%
Colorectal Surgery	0	0	0	38%
Critical Care	5*	0	1	100%
Dermatology	2	1	1	57%
Emergency Medicine	15*	13	2	12%
Endocrinology	1	0	1	100%
Gastroenterology	3	1	2	69%
General Surgery	6	5	1	23%
Hematology & Oncology	3	2	1	39%
Infectious Disease	2	0	2	100%
Neonatal-perinatal	1	0	1	100%
Nephrology	2	1	1	35%
Neurological Surgery	1	0	1	91%
Neurology	4	0	4	100%
OBGYN	9	4	5	61%
Ophthalmology	4	5	0	0%
Orthopedic Surgery	5	3	3	52%
Otolaryngology	2	2	0	0%
Pathology	4	1	3	77%
Physical Medicine and Rehabilitation	2	1	1	41%
Plastic Surgery	2	0	2	94%
Psychiatry	10	7	3	26%
Pulmonology	3	1	2	82%
Radiology	7	8	0	0%
Rheumatology	1	0	1	100%
Thoracic Surgery	1	1	1	50%
Urology	2	1	1	48%
Vascular Surgery	1	0	1	93%
Other category excluded				

Table 7. Supply and Demand by Specialty for Honolulu County <sup>6</sup>				
2016 County Statistics	Honolulu Demand	Honolulu Supply	Honolulu Shortage	Percent Shortage
Primary Care	858	716	142	17%
Allergy & Immunology	14	12	2	16%
Anesthesiology	112	86	25	23%
Cardiology	76	62	15	19%
Colorectal Surgery	5	4	1	19%
Critical Care	18	32	0	0%
Dermatology	31	37	0	0%
Emergency Medicine	105	130	0	0%
Endocrinology	20	18	2	9%
Gastroenterology	42	44	0	0%
General Surgery	79	44	34	44%
Hematology & Oncology	40	33	7	18%
Infectious Disease	27	11	16	59%
Neonatal-perinatal	15	29	0	0%
Nephrology	24	21	3	11%
Neurological Surgery	14	9	6	39%
Neurology	51	37	14	27%
OBGYN	127	128	0	0%
Ophthalmology	57	74	0	0%
Orthopedic Surgery	72	59	14	19%
Otolaryngology	29	27	2	6%
Pathology	58	26	32	56%
Physical Medicine and Rehabilitation	23	26	0	0%
Plastic Surgery	21	24	0	0%
Psychiatry	147**	147	0	0%
Pulmonology	37	22	15	40%
Radiology	90	90	0	0%
Rheumatology	13	13	0	0%
Thoracic Surgery	14	9	5	34%
Urology	31	26	4	14%
Vascular Surgery	9	9	0	0%
Other category excluded				

## Discussion

Hawai'i's overall shortage of physicians has decreased since 2015, however some severe shortages persist. The reality of the future of the physician workforce will probably be described as an environment somewhere between the two projections offered in Figures 1 and 2. Medicare penalties for physician payments will go into effect in 2019, so it is likely that many of the physicians who have resisted Electronic Medical Records or conversion to new payment models will receive up to a 9% decrease in pay in 2019, and may be inclined to retire at a rate higher than the historic baseline.

Initial inquiries regarding reasons for leaving patient care in Hawai'i include low and delayed reimbursements, no job for spouse and frustration with insurance companies in Hawai'i (personal interviews and observations by Kelley Withy and Josh Green). Other barriers to recruitment and retention mentioned in past physician focus groups in Hawai'i include the high cost of housing, frustration with school systems, lack of up to date medical facilities, isolation from family on the mainland and lack of medical community support.<sup>9</sup> While physicians in Hawai'i have not been surveyed regarding their desire to retire, the American Academy of Family Physicians found that 47% of family doctors are considering retiring earlier than planned because of the recent trends in healthcare.<sup>10</sup>

Despite a loan repayment program that has served 25 providers since 2012,<sup>6</sup> expansion of medical school and post graduate training, regular free CME conferences and training, local physician appreciation events, collaboration between recruiters from different groups to assist in attracting physicians and their families to Hawai'i and outreach to rural providers, the growth of the physician workforce is slow and inadequate to keep up with demand. Even more alarming is that in the last year, there have been two reported physician suicides in Hawai'i. Before this past year, no physician suicides were reported in the medical community. These suicides may be unprecedented for the profession in the State of Hawai'i and have raised red flags in our assessment. While the specifics of these events are not known to the authors, even one suicide is too many and anecdotal information suggests extreme financial pressures contributed to one of the fatalities.

It is the authors' position that this is a time for the entire state population to come together to find solutions to meet the growing needs that will ensue with an aging and expanding population. Legislative support for training in specialty shortage areas is vital, as is funding for physician relief efforts such as fair payment, loan repayment, tax breaks, administrative simplification and potentially tort reform. The Hawai'i Physician Recruiters group is working to provide education to all residency programs on how to find jobs in Hawai'i and is reaching out to the Business Roundtable to find work for the spouses of recruited physicians. Medical groups are working to create team settings that can ease the burden on physicians and create a smoother running and lower stress workplace. But there is much more to do. The Hawai'i/Pacific Basin Area Health Education Center (AHEC) hopes to introduce a forum for physicians to share ideas at [www.ahec.hawaii.edu](http://www.ahec.hawaii.edu).

Dike Drummond, the HappyMD describes both Personal and Organizational Burnout Prevention Measures.<sup>11</sup> Personal Burnout Prevention Measures include: self awareness and mindfulness training; appreciative inquiry; narrative medicine; work life balance and healthy boundaries between work and non-work life areas; and lowering stress by a) learning effective leadership skills; exerting control where possible over your work hours; and creating focus where possible on work activities that provide the most meaning. AHEC is working on implementing these for physicians as funding allows. But we need the help of insurers and medical groups to implement the organizational prevention measures described below.

Many of the frustrations in medicine today come from the medical care system. Electronic health records have created additional time burdens and incredible frustration because of the lack of consistency and compatibility. Quality metrics are a new requirement for more reporting that takes away from patient care and is required to get paid in many cases. Medication formularies are always changing and are not transparent. The requirement to get almost any x-ray approved before ordering it is extremely frustrating for patient and physician. Lack of payment for basic screening studies that persists despite Obamacare paired with risk of malpractice if the studies are not covered. Doctors are expected to know what every insurance provides coverage for and how much every test costs because that's what patients need to know. But that information is not available, and a doctor's time is better spent talking with the patient. These are some of the examples of the frustrations doctors face repeatedly every day.

The Happy MD describes activities that can be successfully implemented to ease burnout: State an organizational intention to value, track and support Physician Wellbeing; Institute regular monitoring for physician burnout amongst providers utilizing the Maslach Burnout Inventory (MBI); Create CME programs teaching the Personal Burnout Measures above (AHEC is also working on this); Provide time and funding for physician support meetings; Provide leadership skills training; Support flexibility in work hours; Create specific programs to support physicians suffering from symptomatic burnout.<sup>11</sup> The Happy MD authors call on the leaders in Hawai'i's healthcare industry to make physician wellbeing a priority and address these issues.

Study limitations include the fact that despite the persistence of the research team, it is not always possible to locate all practicing physicians in Hawai'i. In addition, the researchers estimate based on past experience studying the physician workforce of Hawai'i that about 20% of physicians in Hawai'i change jobs annually, making the research even more challenging to report in real time. Furthermore, there are at least 80 physicians who live out of state but report providing telehealth services in Hawai'i as well as in other regions nationally. These services are valuable to Hawai'i but are difficult to quantify for this research. Most of these physicians are radiologists, dermatologists, pathologists and primary care providers.

It is important to note that there are challenges involved in creating an ideal demand model. The researchers decided to base demand on what the average utilization of services is in the



US for the population of each county in Hawai‘i. Therefore the demand represents a picture of what the utilization patterns are in the US, not what is ideal for Hawai‘i. For example, although the estimated demand for physicians in Hawai‘i indicates that we need 500 more, there are currently less than 100 job openings. Of course physicians also practice independently outside of the more easily measured employment environment, launching practice periodically as independent physicians, but we note that starting a private practice is less common in Hawai‘i than in past generations.

Future research will continue to examine the reasons physicians leave Hawai‘i and how to proactively meet the needs of Hawai‘i’s practicing physicians. This may involve surveys or focus groups with physicians to ask: (1) what are the economic and other shortcomings of medical practice in Hawai‘i and how can they be mitigated, (2) are voices being heard and involved in the legislative processes and policy making, and (3) how can we best improve physician practice resiliency? In addition, interventions for burnout and suicide prevention must be implemented and effectiveness assessed.

### Conflict of Interest

None if the authors report any conflict of interest.

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# Preliminary Hawai'i Public Health Workforce Supply and Demand Assessment

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## Abstract

*Ensuring the adequacy of the public health workforce requires an understanding of its size and composition, as well as the population's demand for services. The current article describes research undertaken as a first step toward developing an estimate of the supply of and demand for Hawai'i's public health workforce. Using an organizational-level survey, data was obtained from a subset of 34 organizations considered to be major providers of population-based public health services in Hawai'i. The results indicate that estimates of the existing public health workforce range from 3,429 to 3,846 workers. Calculations of functional demand reveal that an additional 317 to 502 employees will be required to compensate for vacancies and projected retirements over the next five years; though, the discussion points to the fact that this number may be closer to 1,005 to 1,664. While, an additional 594 to 848 employees would be needed to meet the current missions of organizations in this sample and to best meet community need. While these findings are neither exhaustive nor definitive, they raise issues concerning the state's supply of public health workers in terms of their ability to adequately meet demand for services. More research is needed to confirm these findings and track Hawai'i's public health workforce to assure a strong local public health system.*

## Keywords

*Public health workforce, assessment, supply, demand, capacity, health workforce*

## Introduction

The public health workforce is a key component of the nation's public health infrastructure. Ensuring the adequacy of the public health workforce requires knowledge of (a) its size and composition; and, (b) the population's demand for the essential services of public health.<sup>2,3</sup> While this type of information has been available for medicine, dentistry, and nursing for decades, efforts to develop this information about the public health workforce have encountered major barriers.<sup>3,4</sup> Such barriers include: the uncertain boundaries of the field; its multidisciplinary nature; its diverse settings for employment; and, its absence of credentialing requirements.<sup>4</sup> While progress has been made, what is known is largely limited to the governmental workforce, despite high levels of interest in the nongovernmental component.<sup>5</sup> On the demand side, there have been no systematic efforts to assess national need.<sup>6</sup>

Estimates indicate that the national public health workforce has declined by approximately 50,000 people over recent decades, with the ratio of the public health workforce to the US population reported at just 158 per 100,000 in 2000 compared to 220 per 100,000 in 1980.<sup>5,7</sup> While a 2012 estimate suggests that the governmental public health workforce could be as high as 520,000 workers (or as low as 300,000), a minimum of 220,000 additional workers would be needed by 2020 to achieve the same public health workforce-to-population ratio

that existed in 1980.<sup>6,8</sup> However, this estimate fails to account for the rapidly aging workforce and existing shortages, with most state or territorial health agencies reporting shortages in public health nurses, epidemiologists, environmental health workers, and laboratorians.<sup>9</sup> Additionally, the 1980 workforce-to-population ratio (220 per 100,000), though often referenced as a benchmark, likely underestimates the ideal number of public health workers.<sup>6,7</sup>

Information about the local public health workforce is needed to support public health workforce planning and policy development most relevant to states and localities.<sup>4</sup> Hawai'i's State Department of Health (DOH), which is based on O'ahu and includes four district offices distributed across the neighbor islands, is the state's main public health organization.<sup>10</sup> Nationally, Hawai'i's state health agency structure is considered centralized (one regional health department and no local health departments) and small, with the number of full-time employees estimated by the Association of State and Territorial Health Officials (ASTHO) to be 2,593 and the population served smaller than 1,500,000.<sup>11,12</sup> In addition to the DOH, Hawai'i has one graduate public health program, University of Hawai'i at Manoa's Office of Public Health Studies (UH-OPHS), 29 hospitals, 16 Federally Qualified Health Centers and Rural Health Clinics, five Native Hawaiian Health Care Systems, and over 700 nonprofit organizations within the fields of health care/mental health and human services, not to mention the unknown number of for-profit organizations that support public health through the provision of evaluation, data collection, social marketing, and leadership services.<sup>13-15</sup> To varying degrees, these diverse organizations comprise the landscape of public health services delivery in Hawai'i.

Information about the composition of Hawai'i's public health workforce has been generated by the Hawai'i Public Health Training Hui (HPHTH). Through its unique position as the provider of statewide public health workforce training, continuing education, coordination, and collaboration, the HPHTH has developed a network of those who identify or affiliate with the local public health workforce.<sup>16</sup> This network exists in the form of a 1,700-subscriber "Community Partnership" listserv, whose training needs and competency are assessed every three years by the HPHTH.<sup>16</sup> A secondary outcome of these needs assessments has been the collection of compositional data. Regular collection of information on the competency and composition of the local workforce is an important first step. However, only 509 of the 1,693 HPHTH listserv subscribers completed the 2015 needs assessment, so the size of the local public health workforce is still unclear.<sup>16</sup> More precise knowledge of the size

of Hawai‘i’s public health workforce, as well as the demand for services is needed. This study was undertaken as a first step in developing further information about Hawai‘i’s public health workforce, with special attention paid to the non-governmental segment.

## Methods

Using data obtained from a sample of organizations in Hawai‘i through the HPTH, this research explores the size of the local public health workforce and the demand for services. Human subjects’ research exemption was obtained for this study from the University of Hawai‘i Institutional Review Board (#23308).

## Participants

Because a statewide list of public health organizations does not exist, researchers were granted access to the HPTH’s aforementioned “Community Partnership” listserv in July 2015. This listserv includes subscribers from over 120 different organizations, including various departments/divisions of the University of Hawai‘i and the DOH, who have participated in the HPTH’s trainings and created the existing network platform.<sup>15</sup> A total of 46 organizations considered to be major providers of population-based public health services in Hawai‘i were selected. Efforts were made to attain a diverse sample with regard to organizational type and size.

A primary contact for each organization was selected, with emphasis placed on selecting individuals who would know the most about the organization’s employees and plans for expansion. For the most part, this was someone in an executive or senior leadership position, such as the Executive Director or CEO, a Deputy Director, or a Director of Quality Assurance. However, for organizations in which the researchers lacked a preexisting connection to a member of the executive leadership, contacts in less senior positions were selected (eg, Quality/Compliance Manager, Department Director, Program Manager, or a health center Provider).

## Provider Supply Measure

An online survey was developed by the research team to obtain information from employers about their current workforce. The survey was adapted from an organizational-level survey instrument developed by the University of Michigan’s Center of Excellence in Public Health Workforce Studies to assess the public health nursing workforce in state and local health departments.<sup>17</sup> Survey items were reduced to prevent participant burden and adapted to reflect the broader scope of participants. Survey items were multiple choice and fill in the blank. Due to survey logic, the number of items ranged from 10-16, with six questions being dependent on respondents’ previous answers. The instrument was piloted with the UH-OPHS Director and revised prior to dissemination.

Size was operationalized as the number of public health workers employed by a given agency, with a public health worker defined as “anyone who works with groups and/or communities to protect, promote, or advance health/wellness.” In essence, any

worker who engages in population-based public health practices and services was deemed a public health worker. Demand was operationalized in two ways: (1) functional demand — the number of vacancies and projected retirements; and, (2) plans for expansion (if applicable) — the number of additional employees needed to meet the organization’s current mission and to best meet community need. Questions about funding were also asked, as researchers believed funding to be a barrier faced by public health organizations in their ability to meet demand.

To assess demand, the questions solicited information about all employees, rather than public health workers specifically. This decision was made on the assumption that (1) all employees in an organization engaging in population health services can be considered public health workers; and (2) that requesting information about public health workers specifically would be too burdensome for participants, given the broad definition of a public health worker. Plans for expansion were used as a proxy for demand under the assumption that an organization would expand in order to meet a demand that differed or exceeded those served by current levels of services. All answers were solicited as ranges (eg, 5-10 or 11-20) and best estimates.

The survey was administered through Qualtrics, an online survey software, and required less than five minutes to complete. All participants provided their consent to participate in this research study. The survey was administered in August 2015 and remained open for approximately 3 weeks. Periodic reminder emails were employed to improve response rates.

Upon closing the survey in September 2015, a Qualtrics-generated report including frequencies and basic descriptive statistics were downloaded. Raw data was exported into Excel and additional frequencies and basic descriptive statistics were calculated.

## Results

Of the 46 organizational contacts that the survey was sent to, 34 completed the survey (a 74% response rate). Only surveys with a response to every question were included in the results. A variety of organizations were represented; non-profit or community-based agencies comprised the majority (53%), followed by federally qualified community health centers (FQHCs) (21%) and educational institutions (15%) (this category included departments or programs affiliated with larger educational institutions) (Table 1). The majority of organizations were located on O‘ahu (91%); however, a small number of organizations were located on Lana‘i and Hawai‘i Island. Most participants reported their position to be Executive Director (31%) or Director (19%) (Table 1).

## Current Supply

Total estimates of public health workers ranged from a low of 3,429 to a high of 3,846, with an average of 3,638. The DOH was the largest employer of public health workers (Table 2). FQHCs and educational institutions were the second largest employers of public health workers, despite having a smaller representation in the sample than non-profit or community-

based agencies. However, the estimates may be significantly undercounted, as five participants selected the response option of “more than 100 public health workers? Please list,” but did not provide an actual estimate of the number of employees. In which case, both minimum and maximum estimates were counted as 101. For example, one of the organizations that did not originally provide an actual estimate is the largest employer of public health workers in Hawai‘i. However, follow up communication uncovered that there are 2,631 employees at this organization, which was included in the total counts of supply. Another example is a federal agency in the sample, which estimated having “over 10,000” public health workers, but was counted as 101 in this study, as the researchers believed this figure encompassed those employed nationwide rather than just those working in Hawai‘i.

### Current and Future Demand

Most organizations (62%) reported existing job vacancies. Total estimates of existing vacancies ranged from 245 to 327 (Table 3). Additionally, the majority of organizations (65%) submitted an estimate of employees eligible for retirement within the next five years. Total estimates of eligible retirees ranged from 72 to 175 (Table 3). Therefore, an additional 317 to 502 public health workers would be needed to fill these vacant positions and offset projected retirements.

An overwhelming majority of organizations (88%) indicated that they would like to add more employees to their organization. When asked how many more employees would be needed to meet their organization’s current mission, total estimates ranged from 344 to 477 (Table 4). The majority of organizations (76%) reported having plans to expand in the future. When asked how many more employees would be needed to expand services/programs to best meet community need, the total estimates ranged from 254 to 371 employees. In combining these two measures of additional employees, either to meet organizations’ current missions or expand to best meet community need, an additional 598 to 848 employees would be needed to adequately meet demand.

### Funding

In terms of funding, 50% of the organizations indicated they did not have enough funding for their basic personnel infrastructure. The remaining 32% felt they had sufficient funding and 12% replied that they did not know. Among the organizations that reported lacking sufficient funding, 100% wrote grants, 88% sought donations, and 69% pooled resources in order to acquire extra funding. A smaller number of organizations (31%) used endowments as a funding source.

**Table 1. Public Health Workforce Survey Sample Description, Hawai‘i, 2015**

Organizational type	Frequency
Non-profit or Community-Based Agency	18
Federally Qualified Health Center	7
Educational Institution	5
State Health Department	1
Native Hawaiian Health System or Organization	1
Federal Agency	1
Health System or Clinic	1
Total	34
Title	Frequency
Executive Director	10
Director	8
Program Manager	4
Professor	4
Vice President	3
CEO	2
Other	5
Total	36

Note: Individuals who reported having more than one title were double counted across applicable categories; Director = of an organization or department within an organization (eg, workforce development); Manager = of operations, a program, or quality control; Other = board member, attorney, grant writer, medical officer, or staff physician.

**Table 2. Estimated Number of Public Health Workers Employed by Setting, Hawai‘i, 2015**

Work setting	Minimum	Maximum
Non-profit or Community-Based Agency (18)	133	295
Federally Qualified Health Center (7)	277	432
Educational Institution (5)	255	337
State Health Department (1)	2631	2631
Native Hawaiian Health System or Organization (1)	21	30
Federal Agency (1)	101	101
Health System or Clinic (1)	11	20
Total (34)	3429	3846

Note: Organizations that did not provide an estimate of the number of public health workers, if >100, were counted as 101.

**Table 3. Estimated Number of Job Vacancies and Employees Eligible to Retire in the Next Five Years by Setting, Hawai‘i, 2015**

Work setting (# of organizations)	Vacancies Minimum	Vacancies Maximum
Non-profit or Community-Based Agency (10)	20	65
Federally Qualified Health Center (4)	4	20
Educational Institution (4)	19	40
State Health Department (1)	101	101
Native Hawaiian Health System or Organization (-)	-	-
Federal Agency (1)	101	101
Health System or Clinic (1)	0	0
Total (21)	245	327
Work setting (# of organizations)	Eligible Retirees Minimum	Eligible Retirees Maximum
Non-profit or Community-Based Agency (14)	39	100
Federally Qualified Health Center (3)	13	30
Educational Institution (4)	19	40
State Health Department (-)	-	-
Native Hawaiian Health System or Organization (1)	1	5
Federal Agency (-)	-	-
Health System or Clinic (-)	-	-
Total (25)	72	175

Note: - indicates that the participant was not able to provide an estimate.



**Table 4. Estimated Number of Additional Employees Needed to Meet the Organization's Current Mission and Community Need by Setting, Hawai'i, 2015**

Work setting (# of organizations)	Employees needed to meet current:	
	Minimum	Maximum
Non-profit or Community-Based Agency (17)	77	160
Federally Qualified Community Health Center (6)	56	90
Educational Institution (3)	108	116
State Health Department (-)	-	-
Native Hawaiian Health System or Organization (1)	1	5
Federal Agency (1)	101	101
Health System or Clinic (1)	1	5
Total (29)	344	477

Work setting (# of organizations)	Employees needed to meet current:	
	Minimum	Maximum
Non-profit or Community-Based Agency (15)	85	155
Federally Qualified Community Health Center (5)	40	70
Educational Institution (3)	127	136
State Health Department (-)	-	-
Native Hawaiian Health System or Organization (1)	1	5
Federal Agency (-)	-	-
Health System or Clinic (1)	1	5
Total	254	371

Note: - indicates that the participant was not able to provide an estimate.

## Discussion

Results from 34 key organizational players in Hawai'i's public health landscape estimate its workforce to be comprised of 3,429 to 3,846 individuals. This exceeds what can be inferred about the size of Hawai'i's public health workforce from the HPHTH's 2015 needs assessment response rate and listserv network (509 and 1,693 individuals, respectively).<sup>16</sup> This translates to a workforce-to-population ratio to be within the range of 242 to 271 per 100,000, which is markedly better than the 1980 national benchmark (220 per 100,000).<sup>7</sup> While this may not be surprising given Hawai'i's strong investment in public health (\$154.99 per capita versus the national median of \$27.40), it is evident that more comprehensive research efforts are needed to confirm and track the size of Hawai'i's public health workforce.<sup>18</sup>

This study estimates that 317 to 502 public health workers will be needed by these organizations over the next five years to compensate for existing job vacancies and projected retirements. However, these estimations are undercounted, as the participant representing the largest employer of public health workers was not able to provide corresponding estimates. ASTHO reports that 10% to 19% of this employer's positions are vacant and that 20% to 29% of its workforce are eligible for retirement in federal year 2016.<sup>18</sup> In applying these percentages to the aforementioned workforce of 2,631 full-time employees, an additional 789 to 1,263 public health workers would be needed just to maintain the largest employer's current capacity over the next five years.<sup>19</sup> If one were to replace these figures with those provided in Table 3, estimates of functional demand increase to 1,005 to 1,664.

Since 2012, the UH-OPHS has produced between 28 to 37 masters- and doctoral-level graduates per year.<sup>20-23</sup> The number of UH-OPHS graduates has steadily increased and was supplemented by the first class of bachelors-level public health graduates in December 2015. While schools or programs in other disciplines (e.g. public health nursing, medicine, and social work) contribute to the local supply of public health workers, it is evident that the number of graduates from the state's main public health program (UH-OPHS) may be inadequate to meet this study's estimated projected functional demand. Therefore, workforce planning, recruitment, and retention strategies may be needed to overcome this discrepancy.

Up to this point, the discussion has centered on maintaining existing workforce levels. However, the ideal number of workers is yet to be seen. While no methodology currently exists to quantify a population's demand for public health services, this study found that the vast majority of organizations (88%) indicated a desire to add additional employees to their organizations, with an additional 344 to 441 employees needed just to meet their current missions. Therefore, Hawai'i's demand for public health services may exceed the capacity of organizations seeking to meet that demand.

A mismatch between supply and demand would not be surprising, given that 50% of organizations surveyed felt they lacked sufficient funding for basic personnel infrastructure. While results from this study highlight the resourcefulness of public health organizations in their ability to secure additional funding, the systemic underfunding of public health is widely acknowledged. Additionally, these findings point to the fact that, even in a state considered to possess a strong investment in public health, funding may be insufficient. For every dollar spent on healthcare in the United States, only four cents goes toward public health and prevention.<sup>24</sup> While prevention is the most cost-effective and common sense way to improve health, until a paradigm shift occurs prioritizing a culture of health and commitment to prevention, the public health system may continue to be compromised in its ability to optimally meet the population's demand for services.<sup>24</sup>

## Study Limitations

This study is limited by its use of a convenience sample, in that most organizations in the sample originated from the HPHTH's "Community Partnership" listserv. Thus, it is possible that organizations important to the delivery of population-based public health services, but not members of the HPHTH's network, may have been overlooked. For example, only one health system or clinic participated in this survey and the majority of organizations were located on O'ahu. Despite having achieved consensus among the researchers in the selection of organizations considered to be key players in the delivery of population-based public health services, it is possible that bias may have been introduced into the sample, as anecdotal evidence regarding organizational reach rather than set criteria was used to guide this selection. Bias may have also been introduced through the inclusion of organizational contacts



that did not hold executive or senior leadership positions (eg, professor or staff physician), since the extent to which their knowledge differed from those in more senior positions is not known. It has been repeatedly noted that estimates generated by this study may be undercounted due to five participants failure to provide actual estimates when prompted to do so for public health workforce sizes greater than 100. While follow-up with the state's largest public health employer generated a figure for supply, follow-up was inconsistent as it was only conducted with said participant and equivalent figures for functional demand were not provided during this follow-up. Conversely, estimates generated for functional demand and plans for expansion may have been overestimated, as participants were asked to estimate the number of employees generally, rather than public health workers specifically. While this study signifies an important first step toward developing baseline data about Hawai'i's public health workforce, there were several major study limitations, the results are not exhaustive, and the conclusions that can be drawn at this point are preliminary.

## Future Research

The challenges encountered in developing this research largely centered on the absence of commonly held definitions of a public health worker and organization. While efforts to develop a standardized methodology for classifying public health workers are ongoing, improving and standardizing data collection will rely on the adoption and use of such classifications among the diverse organizations that engage in the delivery of public health services.<sup>25</sup> In Hawai'i, efforts to create a public list of organizations that identify or affiliate with the public health community should be initiated. This would allow for easier identification of public health organizations and may promote increased communication and collaboration. A dedicated group should be tasked with encouraging and assisting organizations with the implementation of a standard classification scheme for their public health workers. Those who are involved in the delivery of public health services, but do not perceive themselves as belonging to the public health workforce or field (eg, physicians who perform activities that bridge both personal health and population-focused public health), should be further explored. A data collection system should be developed to conduct regular assessments of the public health workforce in a more comprehensive manner. Developing a system for the regular collection of data on the supply of and demand for the public health workforce will allow for more effective advocacy efforts, workforce policy and planning, and the ability to finely tune delivery of public health services for optimal impact.

## Conflict of Interest

None of the authors identify a conflict of interest.

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# Does Hawai'i Have Enough Psychiatrists? Assessing Mental Health Workforce Versus Demand in the Aloha State

Alexandra Aaronson MD and Kelley Withy MD, PhD

## Abstract

*National data reports the number of adults with any diagnosable mental disorder within a given year is nearly 1 in 5. Hawai'i, along with the rest of the nation, faces a serious shortage of mental health providers. This article describes the research undertaken to create a more accurate assessment of the current mental health provider workforce in Hawai'i through developing an estimation strategy to appraise local mental health workforce needs. The results indicate the supply of psychiatrists for Hawai'i's 2010 census population was found to be 161.4 Full Time Equivalents (FTEs) psychiatrists, or 11.86 psychiatrists/100,000 population, with the greatest number of psychiatrists per capita on the island of O'ahu. Of the 161.4 FTEs, 50.4 FTEs or 31.2% were accepting new Medicaid patients. The state's results show that Hawai'i is short of meeting current patient need by more than 100 psychiatrists though the state was only short by 6 FTE psychiatrists with regard to estimates of Medicaid patients' need. While the first number is likely accurate, the second number is likely to be significantly underestimated for a number of reasons. One reason is that practitioners who reported accepting new Medicaid patients likely see comparatively few. Another reason is that it is likely that Medicaid patients make up more than the approximate 20% of the psychiatric patient population. It is reported nationally that a greater percentage of the mentally ill receive Medicaid than the population at large. Thus, there are probably many more patients on Medicaid than our estimations accounted for. It is clear more research and more changes need to be made in Hawai'i's publicly funded healthcare system to incentivize physician acceptance and make mental healthcare more accessible to this growing population.*

## Keywords

Physician Workforce; Psychiatry Workforce; Mental Health Workforce

## Introduction

Mental illness is a significant issue that affects large numbers of the population the world over. The National Institute of Mental Health reports that the number of adults with any diagnosable mental disorder within the past year is nearly 1 in 5, which is approximately 43 million Americans.<sup>1</sup> Additionally, 20 percent of children ages 13-18 currently have or at some point in their life have had a seriously debilitating mental disorder.<sup>2</sup> Data has also suggested that mental illness is second only to heart disease in terms of United States (US) patients' lost years of healthy life.<sup>3</sup> Despite all the available information suggesting the grave outcomes of untreated mental illness, the nation still faces an overall lack of mental health providers. In one 2009 study, it was estimated that over 77% of US counties have a severe shortage of psychiatrists, with 55% of US counties not having a single psychiatrist in the area.<sup>4</sup> For people struggling with mental illness in places such as these, there is little recourse in managing their symptoms.

Previous national mental health workforce analyses have found Hawai'i is ranked ninth among states with the most psychiatrists per capita, averaging approximately 10-12 psychiatrists

per 100,000 population, even though there are 22 designated mental health shortage areas in the state.<sup>5</sup> This curious finding is due to the distribution of providers across the eight main islands in the archipelago. The vast majority of area doctors are located in and around the capital city of Honolulu on the island of O'ahu while some other islands are without a single mental health provider. Despite Hawai'i's enviable overall number of psychiatrists per capita, many healthcare providers, even those in Honolulu, lament the lack of available psychiatrists, particularly those willing to see patients who receive Medicaid and Medicare benefits. Our study aims to deduce why this is the case. Though some research has been done prior to our study on the number of physicians in the current workforce, the local rates of physician acceptance of federally funded healthcare options has not been assessed. Moreover, attempts at benchmarking workforce to population need, a method explained in several papers by Faulkner and colleagues, have not been made locally to estimate local workforce demand.<sup>6,7</sup>

Our study aims to assess every psychiatrist throughout the state of Hawai'i in order to determine practice location, whether new Medicaid patients are accepted, and the number of hours worked by each physician. By collecting this data we hope to create a more accurate assessment of the current mental health workforce. Then, by comparing this data to local census data and developing an estimation strategy using benchmarks, we hope to estimate local mental health workforce need.

## Methods

The researchers obtained the 2012 licensure list of all Doctors of Medicine (MD) and Doctors of Osteopathic Medicine (DO) licensees from the Hawai'i State Department of Commerce and Consumer Affairs (DCCA). Information obtained included name and mailing address. Physician surveys, Internet searches and phone calls were conducted prior to this study to identify physician specialty, address of practice, date of birth and phone number of practice.<sup>8</sup> In February of 2013, the research team extracted the psychiatrist data and repeated searches of public sources (Hawaii Medical Service Association database, Google, phonebook) to verify each physician's current practice address and phone number. Each physician's office was then contacted to confirm practice location, whether the provider had other local practices, hours each provider worked per week at each practice, types of insurance accepted at each practice and whether the physician was accepting new patients. All physicians found to no longer be practicing outpatient psychiatry within the state of Hawai'i were excluded from the study. If a provider's office could not be reached after three attempts, but

two other members of the medical community could confirm the provider was still practicing, his or her work hours were estimated using the averages of the data set (30 hours/week or 0.75 Full-Time Employees) and it was assumed the address of their practice was correct. One-third of these doctors were assumed to accept new Medicaid patients as was seen with the rest of the workforce contacted. Full-Time Employees (FTEs) were determined by assuming a full-time psychiatrist works 40 hours per week. FTEs were grouped based on the zip code of the practice location and whether or not the practice is accepting new Medicaid patients.

For the purposes of this study, since there is no official statewide data on prevalence of mental illness in Hawai'i, the estimate used is based on national figures. Multiple previous studies, including the Surgeon General's 1999 report on mental illness<sup>1</sup> and the NCS-R report from 2005, have suggested that approximately 20% to 26% of the national population have a mental illness diagnosable by the DSM-IV-TR within a 12-month period.

Approximately 33%-50% of these people seek psychiatric treatment from a physician.<sup>3,9</sup> These studies have also estimated that at any given time 5% of the population has a "serious mental illness" (SMI), defined as mental illness causing significant social or occupational impairment.<sup>3,9,10</sup> Using the 2010 census report and the 2010 Quest report to determine the Hawai'i resident population at that time and the percentage of the population enrolled in Medicaid, this study estimates 5% of the Hawai'i resident population as having serious mental illness (SMI). Not all of these patients receive psychiatric care but, ideally, they should all have access to it, so this entire population is included in the estimate for the optimal number of psychiatrists throughout the state. The team then estimated the number of Hawai'i residents with a non-serious mental illness as 15% of the population (5%-20% SMI population), and assumed 33% of them sought psychiatric help to obtain the most conservative possible estimate of mentally ill population seeking treatment based on previous data.

Larry Faulkner demonstrates that the simplest and most accurate way to estimate physician workforce need is to determine the number of patients who require treatment by a psychiatrist, how much time each patient needs with a doctor, and how much direct patient treatment time a single doctor can provide.<sup>7</sup> The team determined that this methodology, a hybrid of both population-based and benchmarking-based need estimation, was most adequate for structuring an equation to develop a needs-based estimate of workforce demand.

Multiple studies have shown approximately 60% of a psychiatrist's working hours are spent in direct patient care.<sup>10,11</sup> This figure was used to determine that each full time equivalent (FTE) psychiatrist spends approximately 1,104 hours/year in direct patient contact (assuming each FTE works 40 hours per week, 46 weeks per year). Konrad et al, in their 2009 study, also suggest that each seriously mentally ill patient (SMI) spent 4.38 hours per year on average with a mental health providers (MHP) while adults with mild to moderate mental illness spend

12.6 minutes per year on average with an MHP. The research team then multiplied the estimates of mentally ill population by 4.4 for SMI and .2 for mild to moderate mental illness, respectively, to estimate the number of hours of provider services these groups of patients require. This figure was then divided by 1104 (the number of hours a psychiatrist is in direct patient contact per year) to ascertain how many providers are needed to care for all Hawaiian patients.

## Results

The supply of psychiatrists for Hawai'i's 2010 census population of 1,360,301 was found to be 161.4 FTE psychiatrists, or 11.86 psychiatrists/100,000 population, with the greatest number of psychiatrists per capita on the island of O'ahu. Of the 161.4 FTEs, 50.4 FTEs or 31.2% were accepting new Medicaid patients.

The estimated total number of hours of psychiatric treatment required by Hawai'i's population was calculated to be 312,733. This would require 283 psychiatrist FTEs throughout the state, or 20.5 psychiatrists per 100,000 people. The number of psychiatrist FTEs needed to accept new Medicaid/Quest patients was found to be 56 if the percent of the Hawai'i population who receives Medicaid/Quest stays constant. The average age of psychiatrists in Hawai'i was found to be 60, significantly higher than the national average age of 55. The average number of hours worked per week in Hawai'i was found to be 30, which is significantly lower than the national average of 40 hours worked per week.

## Discussion

This study produces a number of interesting findings. For one, based on our equation created by using both population and benchmarking estimation methods, results show that the state of Hawai'i is short of meeting current patient need by more than 100 psychiatrists, though the state was only short by 6 FTE psychiatrists with regard to estimates of Medicaid patients' need. While the first number is likely accurate, we feel the second number is likely to be significantly underestimated for a number of reasons. First, there was definite response bias inherent in the study – we were asking known practitioners directly whether they accepted Medicaid patients, which is seen as providing a sort of charitable service to the community. It is highly probable that practitioners said they were accepting new Medicaid patients but it may only be a few a year. Second, it is likely that Medicaid patients make up more than the approximate 20% of the psychiatric patient population. To be conservative with estimates, since 20% of the total population of Hawai'i received Medicaid, this study assumed that number to hold true for those with mental illness. In reality, it is believed a greater percentage of the mentally ill receive Medicaid than the population at large.<sup>10</sup>

Thus, there are probably many more patients on Medicaid than we accounted for. Third, for physicians who see Medicaid patients, we assumed they spent the entirety of their time caring for the Medicaid community. Though that is true for some physi-



cians, particularly those working in state-funded or grant-funded clinics or those who work within the department of Health, it is likely not the case for physicians in private practice or those who work in hospital clinics. One early study suggests that approximately 8% of a private psychiatrist's practice is made up of government-funded patients, however, given its timing and exclusion of other types of practices this finding did not alter our approach to the data.<sup>13</sup>

The results also show that the average age of practicing psychiatrists in Hawai'i is 60, five years higher than the national average of 55, and that the average number of hours worked per week by psychiatrists in Hawai'i (30 hours/week) is ten hours lower than the national average (40 hours/week). This second number may be somewhat overestimated, also due to response bias, making the number of active Hawaiian psychiatry FTEs even lower.

Unsurprisingly, the data demonstrate that large areas of the Hawaiian islands had no psychiatrists or very few per capita in 2010, including all of Lanai and Molokai and large deficits on Maui, areas of Kauai, Hawai'i and the northern coast of O'ahu. The area with the most psychiatrists per capita was Honolulu and nearby towns. Many things could be done to get more psychiatrists to the Hawaiian islands as well as into the field as a whole. Notably, residency class sizes could be increased, as there are currently many more applicants to psychiatry residencies than there are slots. Despite the growing population size, residency classes have stayed largely the same size for the past several decades. Another promising line of MHP access expansion is the University of Hawai'i's attempt to help patients in rural Hawaiian communities through a telepsychiatry division that aims to provide care to those in areas without any local MHPs. Finally, the University's AHEC center is trying to bring more providers to more rural areas throughout the state by offering loan repayment programs to doctors who agree to work in low-service areas and are willing to see patients with publicly funded insurance. If we could increase the size of all of these programs, we could potentially solve, or at least significantly lessen, these problems.

Another problem facing Hawai'i is how few practitioners are willing to see new Medicaid patients. The Medicaid population in Hawaii is growing, while the number of providers willing to see Medicaid patients is shrinking. Many providers explained on the phone that though they used to see some Medicaid patients, they are unwilling to see new ones due to low reimbursement rates, burdensome restrictions on care, and the ongoing effort required to attain reimbursement. Hawai'i is in an interesting position as nearly all Medicaid options are hybrid HMO plans with private companies. Oftentimes the private companies oversee reimbursement and treatment care plans. In practice since the mid-1990s, area doctors surmise that since this came into being, many stopped, or largely cut down, seeing Medicaid-receiving patients. Obviously, more changes need to be made in Hawai'i's publically funded healthcare system to incentivize physician acceptance and make mental healthcare more accessible. By bringing these problems to light, this study hopes we can better address them.

## Conflict of Interest

The authors identify no conflict of interest.

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# Establishing Successful Patient-Centered Medical Homes in Rural Hawai'i: Three Strategies to Consider

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## Abstract

*The challenges to healthcare delivery posed by Hawai'i's unique geography, physician shortages, and dispersed population are of particular importance in light of implementing the Affordable Care Act (ACA). This study draws on central goals laid out in the ACA — to decrease costs, increase access, and improve patient outcomes. The use of the Patient-Centered Medical Homes (PCMHs) is a care model that has the potential to meet all three goals. How to identify the most effective way to develop PCMHs in the specific context of Hawai'i is the focus of this study. To provide recommendations for effective PCMH formation, a qualitative review of previously compiled data from the Hawai'i/Pacific Basin Area Health Education Center (AHEC) and phone interviews with six primary care providers throughout the islands were conducted. The results broadly suggest three paths towards the effective implementation of PCMHs in Hawai'i. The first recommendation is to create a PCMH template or business model for physicians in order to ease the complexities of implementing such an elaborate system of care. The second two recommendations actually veer away from PCMH towards general interventions to increase care in rural Hawai'i. Thus, the second recommendation is to create a specific track for becoming a rural practitioner at the John A. Burns School of Medicine (JABSOM) to increase the retention of physicians in underserved areas. And the final recommendation is to increase utilization of telemedicine techniques to overcome physician shortages and geographic challenges by allowing rural physicians to network with specialists on neighbor islands. These three strategies are all possible to accomplish with commitment and could be implemented to benefit the providers and rural population of Hawai'i.*

## Keywords

*Patient-centered medical homes, rural care physician shortage, telemedicine, low density populations, business model, rural education track, Affordable Care Act*

## Introduction

Hawai'i faces many challenges in the ongoing development of its healthcare system. Current national trends in healthcare reform, as evidenced in the recent Affordable Care Act (ACA) legislation, include initiatives for lowering costs, improving quality, and providing better health outcomes. One method for reaching these objectives is the creation of Patient-Centered Medical Homes (PCMHs). PCMH's focus on improving care, coordinating services, reducing costs, and thereby improving conditions, which are especially relevant for the geographically-constrained regions and rural communities of Hawai'i.<sup>1</sup> This research explores what rural healthcare providers would need for effective adoption of a PCMH model to improve care in their areas. More specifically, this study suggests strategies to overcoming the interrelated effects of geography, low-density population areas, and physician shortages for the implementation of PCMHs in rural Hawai'i.

Hawai'i is geographically unique, comprised of islands spanning hundreds of miles across the Pacific Ocean. With

the majority of the state's population living on the island of O'ahu, there is a greater primary care physician (PCP) supply on O'ahu as compared to the other Hawaiian Islands. There is a further discrepancy in the number of physician practices from county to county, with the greatest physician to patient ratio existing in the County of Honolulu on O'ahu. Compared to the City and County of Honolulu, Kaua'i and Maui Counties have a 3% greater demand for physicians and the County of Hawai'i has a 6% greater demand for physicians.<sup>2</sup> This unique geography makes the state of Hawai'i difficult to compare to other locations.

Importantly, due to the nature of island geography, it is difficult for residents to access care if the provider type they need is not available within their community, or, in some cases, not on their island. If patients need specialty procedures or testing done that are uncommon or unavailable on their island, then they must fly to O'ahu for those treatments. This can put a heavy financial burden on the patient or their legal guardian because not only will they need to pay for airline flights, but also for accommodations and transportation once on O'ahu if they need to stay for longer than a day.

Given the topography of the Hawaiian Islands, obstacles to healthcare access are especially acute for residents living in rural areas. One of the largest barriers to access for residents is the geographic limitations imposed by being an archipelago in the central Pacific Ocean. Specifically, residents on neighbor islands have limited access to specialty services based out of O'ahu, because specialists are typically located in urban areas with larger populations. According to *the State of Hawaii Primary Care Needs Assessment*, the neighbor islands are considered medically underserved areas/populations.<sup>3</sup> Thus, for the purposes of this study, the researchers consider all neighbor islands rural to Honolulu.

In response to these issues, the ACA encourages physicians in rural areas to adopt PCMH models. Through adopting community-based collaborative care networks, quality health measures and loan forgiveness programs, rural providers are incentivized to embrace team-based healthcare.<sup>4</sup> At present, there are 16 federally qualified health centers throughout the islands, serving the under and uninsured populations of Hawai'i. These community health centers are set up similarly to PCMHs in that they use a team approach to healthcare.<sup>5</sup> However, even with the multiple community health centers, persistent barriers to care exist on rural island.

## Physician Shortages

At the national level, according to a recent study conducted by



Petterson and colleagues (2012), the United States will require almost 52,000 additional primary care physicians by 2025 to accommodate the demand in population healthcare needs. With the passage of the ACA, it is estimated that approximately 34 million people will obtain health insurance coverage, thereby further exacerbating the need for a larger physician workforce.<sup>6</sup> In addition, many states, including Hawai'i, struggle to attract and retain physicians in underserved rural communities that have a higher prevalence of chronic illness. The federal government calculates that approximately 17,000 more practitioners are needed to service the estimated 62 million residents within rural and inner city underserved communities designated by the Health Resource and Services Administration (HRSA).<sup>2</sup>

Locally, Hawaii has a shortage of 500 practicing, non-military patient-care physicians.<sup>2</sup> The physician shortage in Hawai'i is largely attributed to physician retirement, the aging population, and population growth. It is reported that 41% or 1,200 physicians in Hawai'i are 55 years or older and nearing retirement age. Therefore, factoring in physician retirement and population growth, Hawai'i will suffer a net loss of 50 physicians each year.<sup>2</sup> Additionally, with the exception of Honolulu County, all counties of Hawai'i are considered rural communities.<sup>7</sup> This creates a more complex challenge for Hawai'i, as it faces increasing demographic demands for physician recruitment alongside the obstacles of recruiting physicians to a largely rural state. Other factors contributing to recruitment difficulties include compensation and cost of living, workload requirements and after-hour calls, a preference for metropolitan environments, professional isolation, threat of litigation, a lack of community support, and family issues (eg, spousal employment and limited education choices for children).<sup>8</sup>

## Methods

This study takes a qualitative approach to better understand how the PCMH model can be advanced in rural Hawai'i for medically underserved populations. The research team conducted a thorough literature review by searching for approximately 30 key terms through various journal publications. Key terms included words and phrases such as patient centered medical homes, Hawai'i, rural healthcare, accountable care organizations and patient centered care. A full list of terms is available from the authors by request. This literature review was supplemented by previously collected information from survey focus groups conducted by the Hawai'i/Pacific Basin Area Health Education Center (AHEC). Finally, the research team conducted interviews with six primary care physicians (PCPs) from rural areas identified through a mixture of convenience and purposeful sampling. The study was approved by the University of Hawai'i (IRB Reference Number 21886 ) and Pacific University (IRB Reference Number 202-13). This qualitative research design has the advantage of capturing thoughts and ideas about the most effective methods of PCMH formation and implementation for the rural landscape of Hawai'i that might not be possible through a more standardized method. It also allowed the researchers to access provider interests in PCMH formation.

To obtain a representative sample of Hawai'i's spread of full-time equivalent physicians by geographic distribution, three to four primary care providers (PCPs) from each major county including Maui, Hawai'i, Honolulu, and Kaua'i were approached. Local experts who were able to identify providers with experience converting to a PCMH also informed the selection of PCPs. Providers were initially contacted by email and asked to complete a phone interview with the researchers that would be recorded and stored on a password-protected computer. To increase the response rate of physician interviewees, Dr. Kelley Withy, the Director of Hawai'i/Pacific Basin AHEC Program and capstone preceptor, sent an introductory email to potential participants on behalf of the research team. The initial email included information on the research topic, purpose of the study, methods for data collection, time commitment required, the phone interview questions, and a survey monkey link with options for an official phone interview date and time. A follow-up email was sent a week after the initial contact to remind physicians to complete the survey. The researchers, faculty advisors, and sponsoring agency all had access to the raw data. To ensure privacy, however, all personally identifiable information was stored separately from the results of the interviews.

## Data Collection

The questions asked during the phone interview can be found in Table 1.

## Data Analysis

Table 1. Phone Interview Questions	
1. Are you currently in a PCMH?	a. [Yes] How did you go about creating a PCMH?
	b. [No] Have you made any contacts for developing partnerships with other providers or has anyone contacted you?
2. Do you see Hawai'i's geographic challenges as a barrier to PCMH formation? Why or why not?	a. What are some solutions to overcoming these barriers?
3. Do you see Hawai'i's low population density as a barrier to PCMH formation? Why or why not?	a. What are some solutions to overcoming these barriers?
4. Do you see Hawai'i's primary care provider shortage as a barrier to PCMH formation? Why or why not?	a. What are some solutions to overcoming these barriers?
5. What factors influenced you to become a rural practitioner and continue practicing in a rural area?	
6. There have been studies regarding utilization of non-physician clinicians to decrease demand on physicians. How do you feel about working in an inter-professional team?	
7. Do you currently utilize telemedicine?	a. [Yes] How did you implement telemedicine in your practice and what tools do you utilize in your telemedicine practice?
	b. [No] Would you consider utilizing telemedicine in your practice? And why?

To analyze and interpret the data collected from the recorded phone interviews, the researchers utilized the constant comparison analysis method of qualitative data analysis. Recorded phone interviews were reviewed to identify keywords-in-context. Several major themes were identified from the keywords and through the transcription and review of the recorded interviews and data. Next, the themes were compared to the literature review results to see if any new, corresponding or opposing ideas emerged. Finally, the researchers interpreted all data to determine its application to PCMH formation and implementation in rural Hawai'i.

## Results

Of the 14 physicians contacted, seven physicians responded and a total of six interviews were successfully conducted. Of the six final respondents, three physicians were from the island of Hawai'i, one was from Maui, and two were from Kaua'i. To prevent interview bias and protect participant confidentiality, the specialties of the physicians were not disclosed during the interviews.

### (1) Patient-Centered Medical Home (PCMH) Status

Four participants reported working in PCMH systems; and of the two that were not, one was currently working toward developing a PCMH and the other had thoughts about creating one. Despite this distinction, the physicians who participated in this study had similar ideas regarding the needs and barriers for PCMH development. Overall, while generally unconcerned with the population density and geographic limitations, many were very concerned with physician shortages and the use of non-physician clinicians to fill the gap. The biggest barrier for those not in PCMHs seemed to be available training, electronic health record (EHR) adoption, and staffing concerns to create functional systems which could care for a population of people. For instance, one participant noted that resources for "...the training and staff time to meet quality measures" created a barrier for PCMH formation. While there are available financial incentives for developing these entities, most practices spend tens of thousands of dollars on EHRs alone.<sup>9</sup> That cost, coupled with the increase in costs for enrollment in the National Committee for Quality Assurance (NCQA) or private practice PCMH status, accessing quality reporting, and staff development and training can deter physicians from moving their practices into PCMH status.

### (2) Geographic Challenges

The key geographic challenges associated with PCMH formation in rural areas mentioned were provider-to-provider communication and techniques, the usage of rural urgent care clinics amidst the lack of multi-provider clinics, and transportation/resource limitations. Substantial concern was expressed with regards to transportation in island living, especially when specialists are not available for the community or island. One physician observed, "Most [patients] have no way of traveling to [the provider's] location or are traveling anywhere from

50-60 miles. It's inconvenient and expensive, which a large majority of patients can't afford." The use of urgent care facilities is also a key concern for physicians looking to manage a population. As one physician put it, "...there have popped up urgent care facilities in many rural communities and people will use those instead of primary care. So that's one aspect that makes it difficult to follow the precepts of PCMH, when you're geographically inconvenienced to your physician." Further, if visit documentation is not shared, then many services may be duplicated and the most appropriate care may not be performed. Across these identified challenges, respondents recognized that without a network of providers utilizing interoperable communication software, a PCMH model would be inefficient in coordinating care.

### (3) Low-Density Populations

The common responses or key terms that arose from interview items pertaining to low-density populations and the barriers to PCMH formation were similar to those that emerged from the question of geographic challenges, with two exceptions. Physicians identified a lack of resources available to adequately staff a PCMH practice and communication concerns with patients as two obstacles that arise from low-density populations. Physicians expressed concerns about finding qualified staff in rural areas that have the skills to properly diagnose, triage and treat patients to the satisfaction of the physician. Administrators and providers need certified staff with critical thinking skills who can be resources to patients as well as assets to the PCMH and physician staff. For example, one physician stated, "...you gotta send the resources more places. You can't have one training group in a big city and send people to one office." In terms of patient communication obstacles, participants recognized that in many rural communities across Hawai'i, simple access to cellular phone service or the Internet is difficult at times. Reflecting this concern, one participant said, "...even things as simple as a patient portal are not realistic when people don't have good internet access." As patient participation in portal services and patient-to-provider communication are among the quality measures of PCMHs, this issue is not only serious because it is often beyond the influence of the provider, but also because it can affect provider reimbursement.

### (4) Provider Shortages

There were three key barriers presented in response to the question regarding how provider shortages impact PCMH formation: (1) was the higher utilization of non-physician clinicians, (2) physician recruitment barriers, and (3) communication/resource barriers. Although some participants felt that having more non-physician clinicians practicing was a partial solution to addressing the shortage of providers, limited scope of practice was also a concern. The strategy to recruit larger numbers of qualified physicians to work in rural areas in a PCMH model was described as compromised due to the limitations of PCMH reimbursement. Specifically, the physicians interviewed recommended improved reimbursement models for rural PCMH

practices for recruiting physicians who are not indigenous to the area and have existing student loan debt. Articulating the need for modified incentives, one physician stated, "...I think people are open to it [PCMH development in an existing practice] but they aren't going to do it of their own accord." In short, physicians may need to be provided with reasons beyond family and familiarity to seek employment at rural practices. Furthermore, the cost incurred with an increased need for communication between the patient and physicians were also concerns. Improving or finding new and unique ways to communicate with the patient in ways they feel comfortable while being HIPAA compliant was one concern. Another was the availability of typical communication tools, such as telephone or internet, to the patient in rural areas where that type of infrastructure may not be well developed.

### **(5) Rural Practice**

Physicians in this study chose to practice at rural sites because of family, quality of life, or the opportunity for a broader scope of practice. The common theme among all rural physicians surveyed was that they enjoyed broadening their scope of work due to the lack of specialists. As one participant observed, "...you get to have a much more rewarding practice with a lot more variety in a rural area." There was a greater satisfaction in rural medicine for these physicians, because they were not compartmentalized into general medicine and able to work at the top of their license. Family or community ties, whether it be a significant other who wanted to be in a rural area, being raised in the area they practice, or wanting to be involved in the community where they practice, were also commonly cited as a reason for choosing rural locations as the site of their practice. This rationale was linked to quality of life. By creating a foothold in rural communities, physicians felt less burdened, less stressed and more involved with their patients. As one participant noted, "I think we're here because of quality of life."

### **(6) Non-Physician Clinicians**

A general willingness to work with non-physician providers was vocalized. However, concerns were raised regarding patient preference for providers, communication, pay scale clarifications and medical litigation. Having a non-physician provider on the team takes a great deal of communication and trust, neither of which can be developed overnight. Concern about potential litigation highlighted the fact that physicians may be liable for if non-physician providers move out of their scope of practice. Patients expressing preference of a medical doctor over a nurse practitioner or physician assistant was also of concern, especially in medical home models where physician-patient relationships are so important.

### **(7) Telemedicine**

Most physicians interviewed did not use telemedicine due to a lack of resources and absence of a network. Among the exceptions, some physicians reported their practices use remote monitoring equipment for patients. Unfortunately, remote

monitoring requires financial and training resources that many practices cannot afford. In general, the researchers did not receive elaborate answers to this question concerning the use of telemedicine, as rural providers lacked the resources to even be familiar with telemedicine. The authors noted a greater use of telemedicine in larger practice or hospital systems, but it still seems to be used sparingly. Funding for equipment and programs seemed to be a barrier to implementation, as well as the lack of familiarity with how to best implement telemedicine in the practice.

## **Discussion**

Throughout the interviews there was an overall theme of limited resources to develop PCMH practices: Training, recruitment, communication, technology, and financing. With Hawai'i having one of the highest costs of living in the nation, it is no surprise that limited resources pose a great challenge to providers. The authors' recommendations address this common theme of limited resources, but go beyond the arena of PCMH because the content of interviews indicated additional ideas. The first recommendation is to have an agency in Hawai'i develop a business model for PCMH development. Physicians noted that they were willing to develop PCMH practices as long as they were not charged with doing it themselves. The second recommendation is to develop a rural track for physicians at the John A. Burns School of Medicine (JABSOM), as well as to develop recruitment via certification programs on neighbor islands to increase the number of certified nursing support staff available for the rural areas. Our third recommendation is to advance telemedicine opportunities in order to develop greater networks of communication among providers and patients. Even though indirect, this can also increase patient access to specialty physicians in rural areas.

Developing an entirely new way of practicing is not easy or straightforward. Most physicians, while focused on clinical practice, must also serve as business managers if they are in smaller private practices. Even those fortunate enough to practice in multi-provider clinics with administrators where they may not have to manage the business matters of the practice, should still be familiar with them. With PCMH standards from both private insurers and NCQA, the complexity of developing a medical home model can potentially overwhelm or deter physicians. Furthermore, given the initial high costs of developing a PCMH, hiring a consulting agency or a new employee to assist with the process is probably not an option for smaller practices. Additionally, Hawai'i's older physician population specifically could benefit from assistance with implementing this business model. While recent medical school graduates have the advantage of utilizing and studying these technology-based models of healthcare, older physicians may lack the experience or desire to implement these models. Our recommendation is to develop a generalized business plan that physicians can use as a blueprint for developing a PCMH model in their practice.

National organizations such as the American College of Physicians and the American Academy of Family Physicians provide

resources to physicians and administrators for developing PCMH models in their practice. Due to the unique circumstances of Hawai'i's geography and resource limitations, however, having an organization within the state develop a PCMH blueprint that can address these issues can make it more effective. In addition, having trainers on each island available to physicians may make doctors more comfortable implementing the PCMH model. There are some examples of organizations that have offered such models for physicians to utilize. For example, the Icahn School of Medicine at Mount Sinai offers a PCMH resource guide with a comprehensive overview of requirements and standards as well as samples of guidelines for readiness assessments and development in a user-friendly format.<sup>10</sup> Physicians are not typically trained in business administration, but by giving providers the resources they need to succeed we can improve the quality and continuity of care in Hawai'i's rural communities.

A majority of the physicians interviewed noted an early exposure to rural medicine as a reason for being attracted to and continuing to practice in those areas. They also expressed a strong desire for being part of a closely connected community, for greater scope of practice, and for a related sense of a higher quality of life as the positive reasons for practicing in rural areas. The negatives to rural practice included the physician shortage, a lack of qualified physicians and lack of qualified support staff in rural areas throughout Hawai'i. While many programs encourage practice in rural areas, including loan forgiveness and rural recruitment strategies, there is still a strong sense of under-recruitment of and under-utilization of rural students who have a greater chance of returning to rural areas as professionals. Our recommendation is to expand on the excellent efforts of JABSOM's dean and faculty to recruit rural students and train them on neighbor islands. In a similar vein, participants in this study recommended creation of a rural training track to identify students who are interested in rural practice and give them the opportunity to train in those communities similar to those on the mainland.<sup>11</sup> This training track can expose students to mentors in rural areas with a passion for rural medicine, while also introducing students to potential rural work sites.

Hawai'i's key healthcare stakeholders would also be wise to create more programs on neighbor islands to increase the number of licensed practical nurses and qualified medical assistants trained in PCMH and team based care. Such programs could help to ameliorate concerns regarding the number of qualified nursing support staff available to support the medical home model. One participant voiced the difficulty in finding qualified support staff given the location of training on O'ahu, "where everything is," and the need for such staff given that "...the PCMH model is heavy on care management and other activities that a medical assistant or LPN staff would perform." Though there are multiple schools that offer programs to certify medical assistants (MA) and licensed practical nurses (LPN) in Hawai'i, the majority of schools that offer those programs are on O'ahu. Certified MA's and LPN's are necessary to the functionality of PCMH's, as they provide the coordination of

care to other providers along with follow-up to the patient to ensure they are getting the care they need. While nursing staff can support medical homes, the expertise and experience of nurses is better served in clinical practice and not in administrative duties. A well-qualified nursing staff can also be more costly to a PCMH than a well-qualified nursing support staff. Having certified, experienced MA's and LPN's creates a higher functioning PCMH. Yet with programs primarily in Honolulu, it is difficult to educate and retain rural residents in rural practices.

### **Telemedicine**

As one of the most isolated archipelagos in the world, access to healthcare services is extremely difficult in Hawai'i. The adoption of telemedicine in practices and hospitals would provide greater access to an array of specialty services, especially those not typically found in rural Hawai'i. Because many providers currently utilize telemedicine sparingly, greater telemedicine provision offers another path to improving access and the continuity of care. Furthermore, since enhancing access to care and continuity of care are among the determining factors of a successful PCMH, it would be in the best interest of participating rural providers to implement telemedicine in their practices.

Alaska, a useful comparison given its similar barriers to accessible care, has demonstrated what the successful use of telemedicine can look like. Compared to Hawai'i's current statistics, where 15% of physicians performing telemedicine,<sup>12</sup> more than half of providers' contact with patients in Alaska is conducted through telemedicine.<sup>13</sup> We recommend Alaska as a model for implementing telemedicine across the Hawaiian Islands, specifically the counties of the Big Island, Kaua'i, and Maui. However, since adoption of telehealth is currently so low in Hawai'i, it is important that future attempts to incorporate telemedicine be properly facilitated.

There are four primary limitations to this study. The first is the small sample of providers. It is difficult to ensure that the opinions of a few interviewed providers are representative of providers throughout the islands. A related barrier is that, although the recruited participants from the counties of Maui, Hawai'i, and Kaua'i speak to the study's focus on rural health provision, the absence of representatives from the county of Honolulu make the data less generalizable. In addition to the spread of providers, greater variation in the type of primary care providers may have provided more depth and insight. A third limitation of the study is that rather than randomly sampling primary care providers, the researchers only interviewed providers that were associates of the AHEC Director. This convenience sampling approach introduces potential bias. A fourth and final limitation of the study is the potential for bias introduced by the researchers themselves. The researchers were raised in Hawai'i and are invested in the successful implementation of PCMHs throughout the islands. That said, the researchers attempted to refrain from imposing personal interests and opinions throughout the study.

Future research can help to remedy some of the potential limitations outlined above as well as take the next step in as-



sessing how the intensity of the barriers identified here may vary more specifically for certain locations or by type of primary care provider. For example, a larger, random sample of PCPs in rural Hawai'i could help to reinforce the findings presented here as well as allow for a more detailed comparison between providers with PCMHs and those considering their implementation. Additionally, future research could follow up on whether and how provider interests in PCMH, EHR adoption, and telehealth usage are changing over time. Lastly, should any interventions be implemented along similar lines to those recommended, it would be possible to assess the utility of the recommendations as strategies to overcoming barriers to the implementation of PCMHs in rural Hawai'i.

### Conflict of Interest

None of the authors identify any conflict of interest

### Disclosure

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# Comparison of Primary Care Physician Reimbursement Rates in the United States

Nathan Riley MD; Kelley Withy MD, PhD; Kevin Rogers MHA; Ragan DuBose-Morris PhD; and Tiffany Kurozawa

## Abstract

*With a growing shortage of physicians, particularly primary care physicians, the issue of adequate pay in Hawai'i is increasingly important. Anecdotal reports of low pay in Hawai'i have rarely been substantiated. Data from FAIR Health, a company that tracks private insurance reimbursement rates, is compared across the United States (US) for the CPT code 99213. In addition, FAIR Health and Medicare rates are compared for cities with both similar and disparate cost of living to Hawai'i. Hawai'i is in the second lowest quintile for payment in the US for private insurances, and providers are reimbursed significantly lower than in cities with similar cost of living by both Medicare and private insurances. Methods for increasing payment to physicians in Hawai'i are essential to recruiting the necessary workforce. Revising payment methodologies that increase pay for services in areas of unmet need, revising Medicare Geographic Price Cost Indices to better balance pay in areas of need, and making use of the 10% Medicare Bonus Program for physicians working in Health Professions Shortage Areas are first steps to creating a sustainable plan for physician payment in the future.*

## Keywords

Physician Payment; Reimbursement Rates; Primary Care Pay, Medicare Rates

## Introduction

It has long been rumored that physicians in Hawai'i get paid significantly lower reimbursement than their counterparts on the continental US. However, this has rarely been documented. Only recently did a 2016 article in Wallethub.com describe Hawai'i as 51st worst state (out of the 50 states plus Washington DC) when physicians' annual wages are adjusted in terms of cost of living (see Figure 1).<sup>1</sup>

With a current physician shortage of over 228 primary care physicians,<sup>2</sup> in a country that is facing an anticipated national shortage of 52,000 primary care physicians by 2025,<sup>3</sup> Hawai'i must do everything possible to recruit and retain physicians, particularly primary care physicians. A survey completed by the Hawai'i Academy of Family Physicians in 2016 indicated that in Hawai'i, the average salary for family doctors is around \$163,000 a year for full-time employment.<sup>4</sup> Compared to 2015 national estimate of \$195,000<sup>5</sup> for family physicians across the US, this is significantly lower. Therefore, the authors looked for data to examine the question of reimbursement and/or salary rates in Hawai'i compared to the US mainland.

The most common place to find comparative salary information on physicians is the Medical Group Management Association (MGMA), a company that equips medical practice leaders with benchmarking data such as physician compensation for different specialties, experience level, years in practice and other variables. However, because Hawai'i does not have enough large medical groups to survey, MGMA does not perform research in the State and cannot provide salary comparisons other than by regions (which would include the entire western United States in the region).<sup>6</sup>

Therefore, to examine physician compensation the researchers examined private practice and Medicare reimbursement rates for an average primary care outpatient clinic billing CPT code: 99213 (basic office visit). To examine where Hawai'i falls in comparison to similar medical environments, salaries were compared to other cities with similar and disparate costs of living.

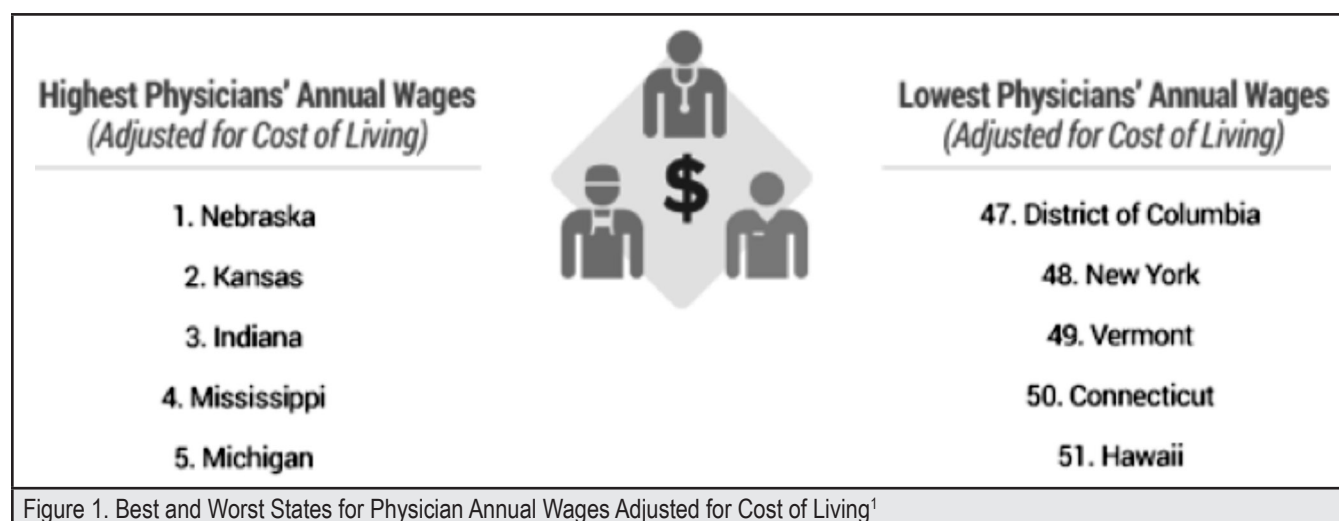


Figure 1. Best and Worst States for Physician Annual Wages Adjusted for Cost of Living<sup>1</sup>

## Methods

To study US reimbursement rates, the researchers purchased a data set from FAIR Health, an independent non-profit organization that offers for-purchase, customizable data sets in US dollar amounts for health services billed to private insurers. The data was comprised of private insurers' reported payments for CPT Code 99213 for basic office visit in the year 2012. The data was provided for 490 localities across the country, identified by "geo zip," the first three-digits in the five-digit zip code. This data was compiled and mapped using ArcGIS Geographic Information System software (ESRI Redlands, CA) for all available geozip locations (see Figure 2).

FAIR Health also has a public site for patients to search comparable costs for care that was searched for updated reimbursement numbers for a 99213 visit in 2016 using the zip codes of downtown areas of cities comparable to Honolulu. These estimates of payment to physicians are available to the public at no charge. The researchers searched FAIR Health data from their Medical Cost Lookup page<sup>7</sup> for more recent data on estimates of reimbursement rates and this is included in Table 1.

In addition, the Centers for Medicare & Medicaid Service's (CMS) 2016 non-facility fees for CPT Code 99213, a basic office visit, were obtained from CMS website<sup>8</sup> in early 2016. To obtain this data, the following fields were selected: 2016/ Pricing Information/Single HCPCS Code/All MACs/HCPCS: 99213/Modifier: Global (Diagnostic Service) OR Physicians Professional Service where Professional/Technical concept does not apply. This information is available to the public at no charge. The research team examined Medicare reimbursement rates in cities with both very similar and significantly lower cost of living indicators to provide an idea of comparative payment across the US.

In order to determine cost of living in different areas, the researchers utilized Cost of living information was found at [www.numbeo.com](http://www.numbeo.com).<sup>9</sup> This site averages the cost of many expenses of daily living including: Salary and financing, apartment rental and purchase prices, clothing costs, sports and leisure costs, food costs, transportation costs and utilities. This source uses New York City as a level of 100 and all other cities are compared to that. Because there is no standard adjustment for health costs, the researchers did not try to adjust reimbursement rates by cost of living, but provided information on cities with similar cost of living listings, as well as markedly different cost of living estimates.

## Results

The range of payment for a 99213 visit by private insurance in 2012 according to the FAIR Health dataset was between \$76 to \$199, with Hawai'i physicians receiving \$100 a visit on average. Medicare physician fee schedule for 2016 for a non-facility CPT code of 99213 ranges from \$60.96 to \$93.91, with Hawai'i being paid \$77.86. Thus, Hawai'i is in the lower to mid range in payments from different insurances, despite being one of the most expensive states in which to live.

The FAIR Health dataset of 2012 data indicates that the amount paid to physicians per visit varies significantly in different areas of the country (see Figure 2).

Table 1 lists the FAIR Health 2016 Medical Cost Lookup amounts for reimbursement, the 2016 Medicare payments for a 99213 office visit and the Cost of Living estimates for the only two more expensive cities in the US and a number of less expensive localities in the US. Of these cities with lower cost of living, many of them have average private insurance pay and/or Medicare pay at rates higher than Honolulu. Thus, while New York and San Francisco have a similar cost of living, payment from private insurance is 70% to 123% higher in these cities than in Honolulu.

## Discussion

This study substantiates that physicians in Hawai'i receive lower rates of reimbursement than physicians in areas of the US with similar cost of living, by examining both private insurance and Medicare reimbursement rates. Lower reimbursement is a debilitating factor for recruiting and retaining physicians in Hawai'i. With the high cost of living in Hawai'i (see Table 1), it is even more important that reimbursement rates be improved. For private insurers, higher reimbursement rates must be implemented by each company individually. Therefore, it behooves the insurance companies to create administrative efficiencies that can allow for improved reimbursements for physicians, particularly primary care physicians. In addition, new payment methodologies that emphasize provision of necessary care, particularly in areas with shortages, can help improve the available workforce in those areas.

One method to improve physician payment in Hawai'i for Medicare patients would be adjustment of the Medicare Geographic Price Cost Indices (GPCI). Medicare is designed to adjust for geographic differences by using as 91 different payment rates depending upon the GPCI for the region in question. These different adjustment factors can be found at <http://satro.org/apc-rvu2016/2016%20GPCIs.pdf>.<sup>10</sup> The three GPCI variables are based on: work GPCI, practice expense (PE) GPCI, and malpractice (PLI) GPCI. Work GPCI includes physician payments, PE GPCI includes rent expense and employee wages, and PLI GPCI includes all fees associated with malpractice insurance. Adjusting any of these variables will affect the payment for a specific service in a specific locality. Manipulating these variables could have important and positive impacts on the payments made to providers in their respective localities of practice.

Medicare is currently revising its payment methodologies through the Medicare Access & CHIP Reauthorization Act of 2015 (MACRA). This move toward value based payments will impact all physicians who care for Medicare patients. Notably, these changes come in the form of ending the Sustainable Growth Rate (SGR) formula for determining Medicare payments for health care providers' services, making a new framework for rewarding health care providers for giving better care not just more care and combining existing quality reporting programs

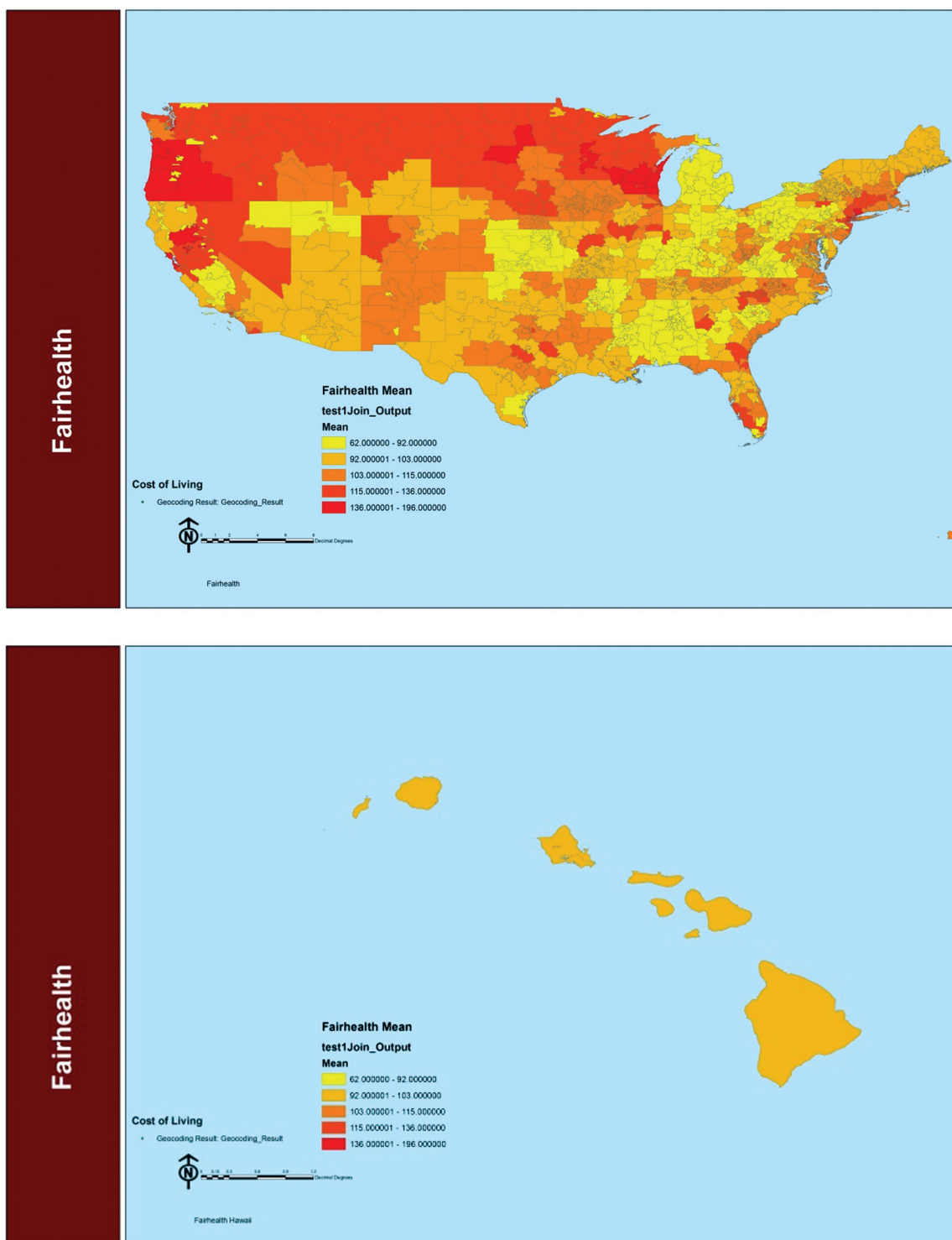


Figure 2. Private Insurers' Reported Payments for CPT Code 99213 in 2012.

Table 1. FAIR health and Medicare Payment by Cost of Living Estimates ranked by City 2016, payments higher than those of Hawai'i in bold

Location	FAIR Health estimate payment (2016) <sup>6</sup>	Medicare payment (2016) <sup>7</sup>	Cost of Living (2016) <sup>8</sup>
New York City	<b>\$175.00 (10001)</b>	<b>\$83.19</b>	100.00
San Francisco	<b>\$230.30 (94102)</b>	<b>\$88.81</b>	98.47
Honolulu	\$103.83 (96813)	\$78.40	97.55
Washington, DC	\$101.50 (20001)	<b>\$83.29</b>	94.62
Anchorage	<b>\$133.70 (99501)</b>	<b>\$93.91</b>	97.40
Las Vegas	<b>\$105.70 (89101)</b>	\$75.37	71.84
Chicago	<b>\$147.70 (60605)</b>	\$77.85	83.54
Minneapolis	<b>\$126.70 (55415)</b>	\$72.42	83.11
Portland, OR	<b>\$135.80 (97232)</b>	\$74.61	79.70
Los Angeles, CA	<b>\$158.20 (90021)</b>	<b>\$80.62</b>	80.44
Orlando, FL	<b>\$105.00 (32801)</b>	\$72.74	79.55
Houston, TX	\$102.20 (77002)	\$74.16	75.39
Phoenix, AZ	<b>\$105.00 (85006)</b>	\$73.09	68.55
Kansas City, MO	\$98.00 (64108)	\$71.73	68.25

into one new system. However the latest information available to the research team suggests that this new payment system will not change the GPCI.<sup>11</sup>

Another action to assist in raising provider reimbursement in Hawai'i is to maximize utilization of the Centers for Medicare & Medicaid Services (CMS) Health Professions Shortage Area Physician (HPSA) Bonus Program. This Bonus program provides the physicians a 10% bonus in their pay if they render service in a designated HPSA to patients covered by Medicare. The bonus is given based on the amount paid for the service and is paid to the professionals quarterly.<sup>12</sup> While this study has many limitations, including comparing data from multiple data sources, it is clear that Hawai'i suffers a disparity in pay that needs to be remedied. Future research could include tracking adequacy of physician workforce in areas with improved reimbursement or pay for physicians.

## Conflict of Interest

Authors report no conflicts of interest.

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# Identifying Barriers in the Use of Electronic Health Records in Hawai'i

Faith D. Hamamura BA; Kelley Withy MD, PhD; and Kira Hughes MS

## Abstract

*Hawai'i faces unique challenges to Electronic Health Record (EHR) adoption due to physician shortages, a widespread distribution of Medically Underserved Areas and Populations (MUA/P), and a higher percentage of small independent practices. However, research on EHR adoption in Hawai'i is limited. To address this gap, this article examines the current state of EHR in Hawai'i, the barriers to adoption, and the future of Health Information Technology (HIT) initiatives to improve the health of Hawai'i's people. Eight focus groups were conducted on Lana'i, Maui, Hawai'i Island, Kaua'i, Moloka'i, and O'ahu. In these groups, a total of 51 diverse health professionals were asked about the functionality of EHR systems, barriers to use, facilitators of use, and what EHRs would look like in a perfect world. Responses were summarized and analyzed based on constant comparative analysis techniques. Responses were then clustered into thirteen themes: system compatibility, loss of productivity, poor interface, IT support, hardware/software, patient factors, education/training, noise in the system, safety, data quality concerns, quality metrics, workflow, and malpractice concerns. Results show that every group mentioned system compatibility. In response to these findings, the Health eNet Community Health Record initiative – which allows providers web-based access to patient health information from the patient's provider network – was developed as a step toward alleviating some of the barriers to sharing information between different EHRs. The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) legislation will introduce a new payment model in 2017 that is partially based on EHR utilization. Therefore, more research should be done to understand EHR adoption and how this ruling will affect providers in Hawai'i.*

## Keywords

*Electronic health records; barriers; MACRA; community health record; physician workforce; Hawai'i*

## Introduction

The passage of the Health Information Technology for Economic and Clinical Health (HITECH) Act in 2009<sup>1</sup> brought the implementation of electronic health records (EHRs) to the forefront of healthcare practice and delivery. In spite of the enormous promise of Health Information Technology (HIT) to benefit patients, reduce inefficiencies, and reduce costs for providers, it is still in the process of being realized.<sup>2</sup> In February 2014, Hawai'i's Office of the Governor published a report declaring HIT connectivity and capability, including EHR adoption, part of a six-point plan to address the future of healthcare in Hawai'i.<sup>3,4</sup> With initiatives such as telehealth, community care networks, and many other novel solutions, the report sets out the goal of achieving “better health, better healthcare, lower costs and reduced health disparities.”<sup>3</sup>

Attempts to develop rudimentary EHR systems (systems containing computerized records of patients' healthcare information) began across the United States (US) in the 1960s.<sup>5,6</sup> By 1965, “at least 73 hospital and clinical information system projects and 28 projects for storage and retrieval of medical documents”

were in the works.<sup>6</sup> As these efforts were heavily constrained by technological limitations, paper records remained the standard for decades. Fast forward to the 21st century, when, despite radical advancements in digital technologies, paper records continue to be favored in many healthcare facilities. Thus, in 2009, the HITECH Act invested \$29 billion to galvanize EHR adoption across the US.<sup>7</sup> As a result, eligible professionals could apply for financial rewards through either the Medicare or Medicaid EHR incentive programs.<sup>8-12</sup> To qualify, providers are required to successfully demonstrate “meaningful use” of a certified EHR system by meeting three stages of progressively rigorous EHR objectives as determined by the Center for Medicare and Medicaid Services (CMS).<sup>8,13</sup> Enrollment in the Medicare incentive program closed in 2014; however, providers could still enroll in the Medicaid incentive program until 2016.<sup>10-12</sup>

Against this backdrop, the adoption of EHRs became commonplace among various health providers by 2015—the year Medicare reimbursement penalties began for providers who failed to meet meaningful use requirements.<sup>9,11</sup> On April 27th, 2016 a Notice of Proposed Rulemaking was released for the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA).<sup>14</sup> The current Medicare reimbursement model and meaningful use-associated penalties will be replaced by the Quality Payment Program (QPP), a new Medicare Part B reimbursement model consisting of the Merit-based Incentive Payment System (MIPS) and the Advanced Alternative Payment Model (APM).<sup>14,15</sup> Instead of meaningful use criteria, EHR utilization will continue to be evaluated as part of the new Advancing Care Information (ACI) category of MIPS.<sup>16</sup>

Although EHRs are now mainstream, responses to EHR adoption initiatives are mixed. While 84% of EHR adopting physicians agreed “EHR use produces clinical benefits,”<sup>17</sup> multiple challenges have also been identified, such as EHR interoperability, usability, and data security.<sup>18</sup> In particular, physicians in Hawai'i face their own compounding challenges to a smooth running healthcare system. These include (1) a growing physician shortage,<sup>19</sup> (2) a widespread distribution of Medically Underserved Areas and Populations (MUA/P),<sup>20</sup> and (3) a higher percentage of small-group practice models.<sup>3</sup>

Healthcare in Hawai'i is greatly impacted by a shortage of over 600 physicians as compared to the number of physicians across the US for a population the same size.<sup>19</sup> By 2020, the shortage in Hawai'i is expected to more than double to 1,600 physicians in demand.<sup>19</sup> The second obstacle is a wide distribution of federally-designated MUA/P across the state.<sup>20</sup> These underserved areas and populations can cover entire islands and are common in rural areas far from the urban capital of



Honolulu.<sup>20</sup> The third challenge is that Hawai'i's physician workforce is composed of many solo and smaller private practices,<sup>3</sup> even though national trends have shifted toward the employed provider practice model.<sup>21</sup> Historically, small group practices were responsible for a "significant portion of the care received by underserved and vulnerable individuals,"<sup>22</sup> and the same trend is expected for underserved communities on the neighbor islands. Without the infrastructure of a supporting organization, it is difficult for small practices to adopt EHRs and avoid subsequent meaningful use penalties. According to one study, family medicine physicians in small practices and those among MUA/P were less likely to adopt an EHR compared to physicians in larger practices.<sup>23</sup> In 2013, overall adoption of EHRs among office-based primary care providers in Hawai'i was 9% higher than the nationally reported average in the same category.<sup>24</sup> However, basic EHR adoption among office-based rural providers in Hawai'i was 7% lower than the national average for the same group.<sup>24</sup>

In the face of new changes to HIT policies, it is unfortunate that there is very little literature specific to EHR adoption and utilization in Hawai'i. Nationally, physicians have cited numerous barriers such as cost, loss of productivity, training, and the EHR selection process.<sup>17</sup> In 2013, a collaborative study between the RAND Corporation and the American Medical Association found that EHRs "significantly worsen professional satisfaction for many physicians."<sup>25</sup> Although there are multiple reasons for the physician shortage in Hawai'i, early physician retirement remains the biggest factor for workforce attrition.<sup>19</sup> In a geographically isolated island state with a physician shortage, many underserved areas, and a trend toward small group practices, it is critically important to support Hawai'i's physicians during their transition to EHR adoption.

To facilitate this process, the federal government funded the creation of Regional Extension Centers (RECs) across the nation to provide "technical assistance for individual and small provider practices, medical practices lacking resources to implement and maintain [EHRs], and those who provide primary care services in public and critical access hospitals, community health centers, and other settings that mostly serve those who lack adequate coverage or medical care."<sup>26</sup> This assistance is available locally through the Hawai'i Health Information Exchange (Hawai'i HIE), the official State Designated Entity for the creation of an interoperable health information exchange.<sup>27</sup> Although REC assistance is available nationwide, numerous challenges to EHR implementation have still been noted in the literature.<sup>17,18</sup> Through a series of focus groups, this study aims to better understand the current EHR landscape in Hawai'i, identify the barriers to adoption of this health technology, and discuss its future role in Hawai'i's medical community.

## Methods

Facilitated focus groups were conducted in 2014 to explore health provider adoption of EHR and other associated health information technologies in Hawai'i. Eight focus groups were held on six of the eight main Hawaiian Islands, including

Lana'i, Maui, Hawai'i Island, Kaua'i, Moloka'i, and O'ahu (West O'ahu, Honolulu, and East O'ahu). Healthcare providers and HIT experts known to the researchers in each region were invited to participate in a focus group that included a meal but no other incentive. Convenience sampling was used, and invitations were delivered by email and fax to provider offices. A total of 51 diverse professionals participated in the focus groups, including 26 physicians, 6 HIT professionals, 5 advanced practice registered nurses, 2 registered nurses, 2 staff members, 2 lawyers, and 1 participant from each of the following fields: physician assistant, case worker, nurse aid, nurse manager, office manager, hospice specialist, finance officer, and chief operating officer. The number of participants in each focus group ranged from 3-13 participants per group.

Facilitators asked open-ended questions to solicit discussion. These questions included use and functionality of EHR systems, barriers to use, facilitators of use, and what EHR would look like in a perfect world. Focus group responses were summarized and analyzed using constant comparative analysis for themes. The frequency of each focus groups discussing a specific theme was tabulated. All participants signed informed consent agreements and were invited to view and comment on a draft report of the findings. In June 2015, an interview with Hawai'i HIE was conducted to verify the current state of EHR usage and upcoming health information technology initiatives in Hawai'i. Marketing data from the Hawai'i HIE Customer Relationship Management System was used as a proxy for EHR vendor usage across the state. Data from the ambulatory EHR market was considered as the closest representative of the research population of interest. This research was performed under University of Hawaii Committee on Human Subjects Institutional Review Board protocol 21832.

## Results

### Utilization of Electronic Health Records in Practice

Of the 42 actively practicing medical providers and staff who answered a focus group question about using an EHR, all but six had an active EHR. Of these six, three participants stated they did not have an EHR, and three had selected EHR software and were planning to go live with it soon. Attestation is the process of documenting the meaningful use of EHRs and whether their requirements are being fulfilled. Attestation was common to all providers implementing EHRs, although those in larger provider groups were less sure of the level of attestation their group had attained.

### EHR Vendors in Hawai'i

A total of 16 different EHR systems were used by those present in the eight focus groups. Two EHR systems were excluded from this study because the description did not translate to known software. The most commonly reported EHR systems among focus group participants were Epic and Allscripts, with 5 users each. GE Centricity, eClinicalWorks, Meditech, and Siemens followed with three users each (Table 1).

**Table 1. Comparison of Ambulatory EHR Vendors in Hawai'i Ranked by Percent Market Share and Number of Focus Group Participants Using Each System**

EHR Software System	Percent Market Share	Number of Focus Group Participants
Epic	18.30%	5
Allscripts/Team Praxis	7.52%	5
GE Centricity	13.96%	3
eClinicalWorks	11.20%	3
Meditech	-	3
Siemens	-	3
Amazing Charts	6.20%	2
RPMS - Indian Health Services	1.20%	2
Practice Fusion	1.31%	1
NextGen	0.45%	1
gMed	0.33%	1
Essentris Clinicomp	-	1
AHLTA	-	1
Legacy CHCS	-	1
Nuesoft Technologies	10.80%	0
Vitera	2.73%	0
eMDs	2.70%	0
Aprima	2.29%	0
SOAPWare Inc	1.64%	0
Document Storage Systems	1.53%	0
McKesson	1.53%	0
Catalis	0.65%	0
Keiser Computers	0.65%	0
Chart Logic	0.45%	0
Dr Chrono	0.45%	0
Spring Medical Systems	0.45%	0
AltaPoint Data Systems	0.33%	0
MTBC (Medical Transcription Billing Corporation)	0.33%	0
Netsmart	0.33%	0
MDIntellesys Inc	0.23%	0
ADP	0.11%	0
Alere	0.11%	0
Athena Health	0.11%	0
Conceptual Mindworks	0.11%	0
Data Tec Inc	0.11%	0
DigiDMS	0.11%	0
Health Fusion	0.11%	0
MDSync	0.11%	0
Other	0.11%	0
SRSsoft	0.11%	0
Unknown/No EHR System	11.34%	6

\* Percent market shares current as of 3/25/2015.

Most of the EHRs described among focus group participants had e-prescribing ability but lacked features to indicate outcomes at the pharmacy (eg, if the prescription was picked up or not). More than half of the EHRs could access labs electronically from at least one laboratory, but very few providers had the capability to order labs electronically. Consults and hospital discharges were more likely to be exchanged using faxes, with the exception of military and Epic systems. Most EHRs had, or will soon have, patient portals; however, usage varied widely due to both patient and provider factors. Billing was usually done through interfaced technology with a third party biller. Quality metrics could be collected by the EHRs, but reporting was done manually in some instances due to the number of different reporting requirements. It was evident that many providers still relied on paper communication as every group mentioned the use of fax machines.

### Barriers to EHR Implementation

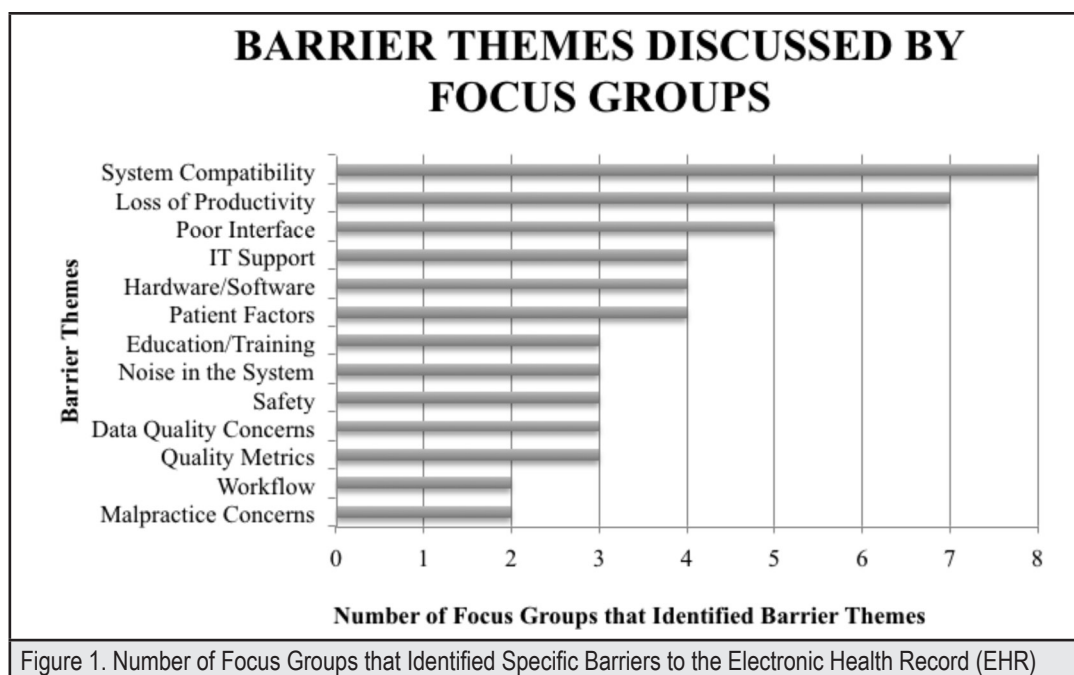
Focus group responses centered on thirteen identifiable barrier themes: system compatibility, loss of productivity, poor interface, IT support, hardware/software, patient factors, education/training, noise in the system, safety, data quality concerns, quality metrics, workflow, and malpractice concerns. Figure 1 presents the prevalence of these barrier themes across the focus groups.

System compatibility was the only theme common to all eight focus groups. Within this theme, participants desired interoperability among different EHR systems and expressed frustration over the inability to engage in efficient health information exchange. Communication issues persisted between providers and hospitals. According to one provider, "You need to learn that all systems at the hospital and in the office don't communicate." Some participants were unable to communicate even when using the same EHR vendor. Another participant stated, "If you have to go to a different hospital that has the same system, they can't necessarily communicate."

Loss of productivity was mentioned as a barrier to EHR utilization by seven out of eight focus groups. Participants agreed that EHR usage took longer than documenting patient visits in a paper chart system. One participant stated, "A computer system doesn't make anything more efficient. When we use paper charts we realize how quick and easy paper is."

Participants also identified poor user interfaces as a barrier. They were dissatisfied with data entry requirements and the number of "clicks" necessary to complete tasks. Participants described many EHR systems as "hard to read and confusing" and were frustrated by the hassles of juggling multiple windows in an EHR interface. Providers felt patient portal utilization, a core measure for meeting meaningful use requirements and receiving EHR incentives<sup>28</sup>, was hindered by various patient factors ranging from a lack of patient access to computers to the inability to bill for telehealth services for patients via email or phone. One provider from a rural area stated, "Only 60 percent of our patients have access to computers."

Hardware and software concerns were mentioned by four of the eight focus groups. Participants were concerned about how



quickly EHRs became outdated and the need for adequate IT support, especially in more rural areas. One participant stated, “By the time we have a good program, we are so out of date that the hardware doesn’t work.” Capturing the need for IT support, another participant stated, “The difference now is that we can’t support it locally like we used to. We have to call off island.”

In addition to concerns about maintaining adequate EHR systems, some providers questioned the integrity of EHR data and the potential perpetuation of errors through incomplete or repeated data entry. According to one participant, “I’m worried that if we just check off boxes, we don’t know if people actually did the things that are checked...” In addition, some providers expressed dissatisfaction with the “signal to noise ratio” of EHR records. For example, “One progress note ends up being three pages. It’s hard to draw out the basic information.”

Some healthcare providers were concerned about confidentiality, medical malpractice, quality metrics, and overall workflow. One participant commented, “From a patient perspective it is scary that all your info is in ‘the cloud.’ What will happen if I apply for life insurance?” Mental health records in particular can contain sensitive information. Patients and providers desired the assurance of confidentiality during health information exchange and recommended allowing patients to opt-in or opt-out of sharing mental health records. Furthermore, some providers thought the additional information available in an EHR could potentially increase the likelihood of malpractice suits. One participant stated, “Obscure information is a treasure trove for attorneys when something goes wrong.”

Opinions about quality metrics programs were mixed. Dissatisfaction with insurance-based quality program technology stemmed from a lack of interconnectivity between systems,

missed documentation, and requisite data entry. As one provider noted, “... the technology is not there.” Providers also described interrupted clinical workflows when using EHR. One participant stated, “EHR hurts flow, ability to code charts, and transmit charts to billing.”

#### HIT in a “Perfect World”

Focus group participants were not only able to identify barriers, but also provided ideas on what they would want from HIT. Suggestions included intelligent data output, a central data warehouse, inter-professional team support benefits, high security, improvement of patient care, lower cost, system interconnectivity, and a one-time sign in. Respondents described the need to minimize unnecessary effort by reducing duplicate tasks and eliminating “noise” in the patient record. Providers desired EHRs to be an asset to medical practice that improves patient care. Ideally, an EHR would “maximize time with the patient and get human direction back into medicine.” Additionally, “HIT should allow providers to retain independence and practice the way they want to.” Some participants believed HIT could improve patient care by being more patient-centered, including only essential information, and rewarding “service to the patient that improved health.” Reflecting the commonly identified system compatibility barrier, a desire for system interconnectivity, especially the ability to conduct health information exchange, was voiced by many providers. For instance, one participant stated, “I wish we were all on one system and could go into anyone’s record and get all the info.” A suggestion was made for a one-time pass through option for providers to log in to one EHR system that will forward credentials to other systems and avoid redundant sign in efforts.

Linked to the desire for greater system interconnectivity were suggestions regarding uniformity of requirements, telemedicine/telehealth, a data warehouse, and many other desired features and functionalities. The suggestions included standards for mandatory immunization reports, a universal intake form, and a single “platform for quality metrics and pay for performance.” Although there was a mention of billing and liability concerns, focus group participants supported “telemedicine as a strategic initiative” for its practicality and ease of use. According to one participant, “[It] doesn’t make sense to fly people all over if you can use telehealth.” Another participant stated, “Telehealth will be the key for chronic disease in the future. It’s a no-brainer.” Participants also described the need for a “bucket approach” to a patient data warehouse or a “central data repository that can be queried”. One participant commented that it would “be asking less of providers if the technology were better and we could get all the info from one location.”

Focus group participants also shared many new, innovative ideas. Among them were ideas for a patient profile with risk factors and anticipatory guidance, the distribution of handouts in patients’ native languages, a medication management tool, character recognition for identification of scanned lab results, and the ability to remotely prescribe.

## Discussion

This study presents an overview of recent EHR utilization in Hawai‘i. While a great deal of frustration around EHR remains, the general sense of the participants is not only that EHR is here to stay, but also a hope that it will improve patient care in the future. The implementation and utilization of an EHR still seems to outweigh the relative ease of paper charts. Providers felt that it was worth the work to convert to EHRs and improvement discussions were lively. In the words of one focus group participant, “Done right, you can make it work.”

Many of the frustrations with EHR systems in Hawai‘i are echoed nationally. One of the first barriers to EHR adoption is choosing the right system. A national study conducted in 2011 found that both EHR adopters and non-adopters considered EHR selection to be within the top five barriers for EHR implementation.<sup>17</sup> For small or solo practices, the full responsibility of researching and choosing an EHR can be a burden on the physician. One participant said, “Most developed countries have a single EHR system, why don’t we?” Another participant was “tied to one product that was only used for a few years.” As of August 2013, out of close to 1,400 complete EHR systems certified for Stage 1 of meaningful use, only 21 complete systems were certified for 2014 Stage 2 requirements.<sup>29</sup> The disparity between Stage 2 demands and a lack of Stage 2 meaningful use certified EHR vendor supply put providers in a difficult, costly dilemma. Based on certification status, providers who had adopted an EHR ineligible for Stage 2 of meaningful use attestation faced the difficult choice to either reinvest time and funds “to ‘rip and replace’ their existing EHR” or forfeit incentive payments and incur Medicare penalties.<sup>29</sup>

While the focus group participants did not describe the selec-

tion as frustrating, they did describe the lack of functionality frustrating. One focus group participant mentioned, “A lot of what Medicare level 2 is asking us to do what our EHR can’t do.” Another attendee said, “It’s like running a race with shackles on if the EHR is not user-friendly. Most are sluggish and have limited capabilities.” Only 57% of rural Hawai‘i providers had achieved meaningful use compared to 73% of rural providers at the national level,<sup>24</sup> which could be influenced by geographic isolation from Honolulu and the many MUA/P across the state.<sup>20</sup>

Reported EHR systems among focus group participants varied, but generally reflected commonality with state and national ambulatory EHR vendor data. According to the Office of the National Coordinator for Health Information Technology, the top five ambulatory EHR vendors nationally were Epic, Allscripts, eClinicalWorks, NextGen Healthcare, and GE Healthcare (Centricity) respectively for ambulatory EHR systems.<sup>30</sup> These systems aligned with the four most frequently reported EHR systems among Hawai‘i focus group participants (Epic, Allscripts, GE Healthcare (Centricity), and eClinicalWorks; Table 1).<sup>30</sup> However, there are exceptions to this trend. Nuesoft Technologies occupies 10.80% of the ambulatory EHR market in Hawai‘i, yet this vendor was not represented among focus group attendees (Table 1).

Percent market share data were unavailable for five of the EHRs utilized by focus group participants. Of these missing data, three of the systems were military or Veteran’s Administration-based. The other two vendors, Meditech and Siemens (Cerner), are well represented in the hospital EHR market and are not likely to occupy a significant portion of the ambulatory market in Hawai‘i.<sup>31</sup>

Some physicians view the tedious process and cost factor of EHR implementation as a fruitless endeavor, especially those near retirement age. The upfront startup cost for an in-office EHR system was estimated to be \$33K with a five-year total cost of ownership at about \$48K.<sup>32</sup> In 2013, EHR non-adoption was indicated by less than 10% of all physicians with 41% of this population composed of retiring physicians.<sup>33</sup> According to one provider, “I’ve only got a few more years until I retire. It’s just not worth it.” More research is needed to develop effective solutions to convince those who are considering early retirement to stay in practice. In addition, the number of physicians retiring early may increase based on upcoming Medicare reimbursement changes in 2017<sup>14</sup>, especially since Hawai‘i has the second oldest physician population in the nation.<sup>34</sup> As a result, these reimbursement changes could create an extra burden for physicians who are older or in small practices, both of which are represented in greater numbers in Hawai‘i than the rest of the country.<sup>21</sup>

Under the meaningful use system, providers who did not meet meaningful use requirements would begin receiving an annually increasing 1% Medicare reimbursement readjustment in 2015.<sup>9</sup> The penalty would increase annually for each year of noncompliance with meaningful use regulations up to a maximum total deduction of 5%.<sup>9</sup> However, this payment readjustment scale will be replaced by upcoming MACRA changes.<sup>14</sup>



Instead of attesting to meaningful use, eligible professionals will be evaluated by a four-part performance-based MIPS score, of which the ACI category currently comprises 25%.<sup>14,16</sup> ACI includes EHR utilization with “emphasis on interoperability and information exchange.”<sup>16</sup> Unlike meaningful use incentives, MACRA evaluates providers relative to other providers across the nation based on the MIPS score, and adjustments must be budget-neutral.<sup>14</sup> In year one, participants may be subject to a range of +4% to -4% Medicare reimbursement adjustments based on their MIPS performance score with future adjustments increasing in magnitude: +/-5% in 2020, +/-7% in 2021, and +/- 9% in 2022 and beyond.<sup>14</sup> Although the EHR utilization or ACI category will compose a fourth of the MIPS score in year one, it is unclear if this proportion will change and what role EHR utilization will play in the upcoming changes to Medicare reimbursement. What is clear is that it will likely result in a significant downward income adjustment for physicians without high-functioning EHRs.

Among focus group participants, decreased revenue or more specifically, productivity loss, was a highly discussed barrier. Higher costs for providers are ultimately linked to productivity loss and any reduction in patient volume ultimately translates to lost revenue. One participant stated, “You have to hire a new staff person to do all the scanning and printing.” Another said, “We’re so busy that to go ahead and put in an EHR and slow down office practice would be difficult. We already spend enough time at our office.” Taking the appropriate steps to evaluate a practice’s readiness for EHR conversion can facilitate a smoother transition and minimize unexpected challenges. Hawai‘i’s high population of smaller physician practices means providers are less likely to have the support of larger organizations when managing EHR implementation.<sup>3</sup> Thus, creating an EHR implementation strategy with stages of planning and evaluation can facilitate this process.<sup>27</sup> One participant suggested to complete a “workflow pre-implementation” check and “recheck post-implementation.” It has been done, which is demonstrated by a rural Wisconsin physician. Through careful planning and local REC assistance, they transitioned to EHR without forfeiting patient volume.<sup>35</sup> Other providers have a more difficult time with EHR implementation. As one provider stated, “We need EHR SWAT teams to start workflow analysis and fix it.” Technical assistance and education can greatly facilitate successful EHR adoption, especially in small practices.

### Technical Barriers

A previous study demonstrated that eight or more technical support visits and at least nine months of EHR utilization were associated with quality improvement in “small primary care practices serving disadvantaged populations.”<sup>36</sup> Education and training can help providers and staff use an EHR to its fullest potential. However, access to technical assistance is complicated for neighbor island providers. One attendee stated, “If we want to get trained we have to go to Honolulu. We have to bear the cost of bringing someone over to educate our office.” Although technical support is available, focus group participants reported

that outsourcing EHR training and technical support from O‘ahu was resource intensive. Nevertheless, the importance of technical assistance to facilitate implementation and fulfill security requirements cannot be understated.

Data safety and confidentiality were major concerns for focus group participants. Some participants were particularly concerned about the confidentiality of sensitive mental health records. One provider stated, “My patients voice concern and I share their concern that easier IT access to patient mental health records by other providers may not be appropriately protected.” Furthermore, implementation of EHR in behavioral health settings is lower than other healthcare providers, and some mental health providers were ineligible for meaningful use financial incentives based on the setting of care.<sup>37-38</sup> In order to meet meaningful use requirements, eligible professionals are required to conduct a mandatory security risk analysis at the time of EHR adoption and review the analysis each reporting period thereafter or sooner if changes occur.<sup>39</sup> According to CMS, “doing a thorough and professional risk analysis that will stand up to a compliance review will require expert knowledge that could be obtained through services of an experienced outside professional.”<sup>39</sup> Focus group participants expressed hesitancy about the security of protected health information. To remain in compliance with security standards, providers can seek technical assistance from RECs to conduct security risk assessments.

One of the other challenges in EHR adoption in Hawai‘i is small group practices. Current five-year projections put the total cost of EHR implementation at \$48K.<sup>32</sup> This estimated amount can be much higher when considering the resources required to outsource training on the neighbor islands. There are even more costs associated with maintaining the EHR, upgrading systems, meeting meaningful use requirements, and conducting audits. Although workflow was only mentioned by two out of eight focus groups, the concept of workflow is interwoven into the other barriers. Previously, failure to meet meaningful use requirements meant that providers would be disqualified from incentive payments that could offset EHR costs in addition to receiving decreased Medicare reimbursements.<sup>9</sup> It is still unclear how new MACRA changes will affect providers in small practices.

One of the greatest frustrations with EHRs identified by focus group participants was the lack of system compatibility. Providers desired interoperability and efficient health information exchange. Even though one provider “worked in a community that all had” the same EHR system, “they still didn’t communicate.” Because of the proprietary nature of EHR systems, this is one of the greatest challenges facing healthcare effectiveness in the US. However, attendees had positive opinions about a centralized data warehouse.

Since these focus groups were conducted (2014), Hawai‘i HIE has made a major upgrade to the Health eNet Community Health Record (CHR).<sup>40</sup> The CHR is a web-based dashboard, a way of querying the patient health information (PHI) from small physician practices, hospitals and other health care facilities through a secure web-based portal to gather relevant PHI

into a front-porch style view.<sup>40</sup> In effect, the CHR acts as an intermediary for providers to access patient information through a central health information exchange portal that can be queried on patients who are seeking care.<sup>40</sup> This technology has potential for situations that may occur outside the typical ambulatory setting and require immediate medical care. Similar initiatives are in development across the country with the eventual goal of national interoperability.<sup>41</sup> For example, partnerships may eventually allow providers to query another state's CHR to care for a traveling patient. This could be a valuable asset in providing timely emergent care for neighbor island patients treated on O'ahu, as well as the high influx of tourists and short-term stay individuals in Hawai'i.

Having the opportunity to utilize health information exchange through a medium like the CHR is especially important for care coordination efficiency. If a neighbor island patient travels to O'ahu for specialist care (which happens often), these records must be shared with the individual's primary care provider for care coordination. When health information exchange is not readily accessible, one focus group participant described it as "... a wild goose chase to get records." The ultimate goal for providers is to have an integrated EHR exchange system that is easy to use, efficient, and cost-effective. As of yet, complete interoperability is still a work in progress, but through initiatives like the CHR, it is not out of reach. Additional progress has been made with new collaborations among major hospital systems and key laboratory service groups. The CHR has great potential to advance health information exchange among all healthcare providers in Hawai'i, even in rural areas.

Limitations of this study include the fact that focus group methodology does not allow for the input of all physicians in the state. Therefore data may not be reflective of all providers across the state. In addition, the participants were selected with convenience sampling, and may over represent some places of employment. Attendance was not consistent across all focus groups, possibly leading to overrepresentation of certain communities. Additionally, self-reported data may be influenced by the presence of colleagues in a group setting. Furthermore, statistics from the Office of National Coordinator for Health IT are based on providers enrolled in an REC. This population is likely to represent the vast majority of EHR adopters; but there may be some providers utilizing EHRs who are unaffiliated with an REC.

The technology industry is highly labile and significant changes may have occurred from the time data were collected until the writing of this article. Data from Hawai'i HIE was current as of March 25, 2015, and the focus groups were conducted in 2014. The marketing data was generally representative of ambulatory providers in Hawai'i. However, focus group attendees included professionals from many different settings, including those outside of ambulatory settings. For the purposes of clarity, the terms EHR and EMR were used interchangeably and recorded as EHR even if the participant said EMR. Term usage of EHR vs EMR was generally evenly divided.

## Conclusion

While we cannot make generalizations about the entire provider population, this study offers a glimpse of the recent state of EHR utilization in Hawai'i. In this era of continual technological progress, many challenges continue to exist at the intersection of technology and medicine. In the midst of increasing requirements and challenges, the enormous promise of HIT is closer to realization than ever before. For physicians in Hawai'i, this means the recent transition to EHRs not only fulfills national mandates, but also promotes the future of Hawai'i's health. The hope is that increasing HIT utilization, health information exchange, and EHR adoption will contribute to more efficient, coordinated care and better health outcomes.<sup>3</sup> The many challenges during this transition period highlight the importance of adapting as health technology moves forward. The hope is that in the future providers will be equipped with better tools, such as the CHR, which will result in efficient health information exchange, well coordinated care, decreased health disparities, and ultimately a healthier Hawai'i for future generations.

Future research examining changing attitudes toward the EHR, especially as compatibility improves, would provide new insight. Future studies could investigate the perspectives of small group practices adjusting to the MIPS criteria and how initiatives such as CHR will impact interoperability across the state. Furthermore, with the change from Meaningful Use 3 to MACRA incentives, physicians are not sure how rewards and penalties will be allocated. Research into physician satisfaction with reimbursement and support for EHRs will go a long way in ensuring successful implementation.

## Conflict of Interest

None of the authors identify a conflict of interest.

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# Beyond the Ability to Pay: The Health Status of Native Hawaiians and Other Pacific Islanders in Relationship to Health Insurance

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## Abstract

*Native Hawaiians and Other Pacific Islanders (NHOPI) suffer from a number of poor health outcomes, such as high rates of overweight status, obesity, hypertension, and high rates of asthma and cancer mortality. In addition to a disproportionate burden of illness, barriers to health care access and utilization also exist. This study examines the effect of health insurance coverage on the health status of NHOPI in comparison to Asians. To analyze this relationship, the study uses the Behavioral Risk Factor Surveillance System (BRFSS) 2012 data and logistic regression. Findings show insured NHOPI were significantly more likely than insured Asian Americans to report poor or fair health after sequential cumulative adjustments of socioeconomic, lifestyle and behavioral factors, history of diagnosed diseases, and access to care (OR: 1.66, 95% CI: [1.34, 2.05]). Health insurance alone will not eliminate the present disparities experienced by NHOPI. Other barriers prohibit health care access for NHOPI that should be considered in the investigation and development of strategies to increase healthcare access and eliminate health disparities for NHOPI.*

## Introduction

According to the United States (US) Census Bureau, there are an estimated 1.4 million Native Hawaiian and Other Pacific Islanders (NHOPI) currently living in the US.<sup>1</sup> This population suffers from the highest rates of heart disease, hypertension, asthma, cancer incidence and diabetes in comparison with all other ethnicities. Despite having some of the highest healthcare needs, they also continuously experience barriers to accessing healthcare and utilizing quality services.<sup>2-4</sup> In comparison to the majority population, NHOPI experience extreme health disparities indicated by high mortality rates and low life expectancies as a result of colonization and historical trauma. Colonial forces prohibited the transmission of language, culture, and traditional practices resulting in significant damage to health, education, and social well-being.<sup>2-5</sup> These outcomes are argued to make the history of colonial oppression a key determinant of health for NHOPI.

Health services are essential to treatment and prevention of illness. The Institute of Medicine defines quality health services as, “appropriate care at the appropriate time by the appropriate provider.”<sup>6</sup> Access to healthcare and health outcomes are often determined by factors beyond health insurance coverage, including those related to individuals, their families, communities, and the healthcare system.<sup>7</sup> With the passage of the 2010 Affordable Care Act (ACA), there has been much focus on restructuring the US healthcare system and placing a strong emphasis on providing affordable insurance.<sup>8</sup> However, eliminating the barriers of financial access may not necessarily improve access to quality healthcare. This paper explores if health outcomes are comparable between NHOPI and Asian patients when insurance coverage is the same and other variables are controlled.

## Methods

This study examines the relationship between health status, health care access, and health outcomes for Native Hawaiians and Other Pacific Islanders (NHOPI) compared to Asians. Asians are the comparison population because they experience the greatest positive health outcomes and lowest mortality and disease prevalence rates.<sup>9</sup> Human subjects research exemption was obtained for this project from the University of Hawai'i Institutional Review Board (#21928).

Secondary data analysis was conducted using the 2012 Behavioral Risk Factor Surveillance System (BRFSS) data set. The BRFSS is an annual, state-based, random-digit dialed household telephone survey of the non-institutionalized US civilian population aged  $\geq 18$  years. As the world's largest telephone survey, this system provides a key source of data specifically related to health risk behavior, a history of disease, and access to healthcare. With assistance from the Centers of Disease Control (CDC), this national survey is conducted monthly in all 50 states, the District of Columbia, US Virgin Islands, Puerto Rico, and Guam. The final sample included 3,021 Native Hawaiians and Other Pacific Islanders and 10,479 Asians living in the United States and affiliated US Territories.

Access to healthcare is quantified using four core questions in the BRFSS survey. The four healthcare outcome measures include: (1) did the respondent had health care coverage in the form of health insurance, prepaid plans, or government plans such as Medicare; (2) did the respondent experience a health care cost barrier in the past 12 months; (3) did they have a usual source/provider for healthcare (defined as having at least one person they considered a personal doctor); and (4) did the respondent visit a doctor for a routine checkup in the past year. Socio-demographic variables include: gender, marital status, employment status, age, education level, and household income. These factors are conceptualized as a broad set of social determinants for health and healthcare. Lifestyle and behavioral factors assessed include: current status on smoking, drinking, and weight. These variables represent lifestyle risk factors that may affect individual beliefs, behaviors, and needs associated with healthcare.

Self-reported health measures include general health status categorized as “good” or “better” and “fair” or “poor.” These are conceptualized as perceived health need factors that underlie health-seeking behaviors.

History of diagnosed conditions include whether the respondent had ever been told by a doctor, nurse, or other health professional that they had diabetes, heart attacks, angina or



coronary heart disease, stroke, kidney disease or depression. These factors represent physician-evaluated health-need factors that may influence one's access and utilization of healthcare in ways that are different from perceived health need factors.

A bivariate analysis was used to compare health care access, demographics, lifestyle, socioeconomic status, health status, and history of disease indicator variables between NHOPI and Asians. Additionally, this study employed  $\chi^2$  goodness of fit tests to evaluate if the proportions differed comparing NHOPI and Asians.

A logistic regression was performed to assess the unadjusted odds of reporting fair or poor health only among those with health insurance coverage. Additional analyses were carried out to determine the adjusted effects of reporting fair or poor health and each socioeconomic, lifestyle, disease state, and health status factor stratified by ethnicity. Additional analyses were also carried out with fair or poor health as the outcome adjusting for ethnicity and including individually socioeconomic status, lifestyle, or disease state. The results are reported as odds ratios (OR) with an OR > 1 indicating exposure is associated with higher odds of an outcome. Additionally, 95% confidence intervals are provided as an indicator of statistical significance in the association between variables if it does not overlap with the null value (OR=1). All statistical analyses were performed using STATA version 13 (College Station, TX).<sup>10</sup>

## Results

Table 1 and 2 describe provide a descriptive analysis of Asian and NHOPI populations as distinct groups based on the socioeconomic, lifestyle and behavioral factors, self-reported health status, and prior diagnosed conditions. Native Hawaiians and Other Pacific Islanders in the US are more likely to be unemployed (17.4% vs 9.1%), have less than a high school education (53.0% vs 22.2%), and live below the Federal Poverty Line (FPL) (18.2% vs 9.4%) than US Asians. NHOPI also reported greater prevalence of diabetes (10.9% vs 8.2%), heart disease (4.1% vs 2.3%), depression (12.4% vs 7.2%), kidney disease (4.1% vs 2.0%), heart attacks (4.8% vs 2.3%), and stroke (3.3% vs 1.9%). Additionally, NHOPI reported higher rates of having fair or poor health (22.5% vs 11.1%), being obese (71.0% vs 42.6%), smoking (24.0% vs 9.5%), and heavy drinking (7.8% vs 3.4%), when compared to Asians.

Table 3 summarizes the differences between healthcare access, barriers, and utilization by health insurance coverage for US NHOPI compared to Asians. NHOPI are significantly more likely to experience a cost barrier to accessing healthcare when compared to Asians ( $P<.001$ ). This relationship persists between those with insurance (Asian: 8.1% vs NHOPI: 14.7%) and those without insurance (Asian: 33.1% vs NHOPI: 41.4%). Additionally, uninsured NHOPI (40.9%) are significantly less likely to obtain an annual checkup when compared to Asians (46.8%).

Table 4 compares these two ethnic groups under the condition of both holding insurance and indicates the change in odds of NHOPI, compared to Asians, experiencing fair or poor health

Socio-Demographic Factors	NHOPI (N=3,021)	Asian (N=10,479)
	n(%)	n(%)
<b>Sex</b>		
Male	1,322 (43.8%)	4,994 (47.7%)
Female	1,699 (56.2%)	5,485 (52.3%)
<b>Marital Status</b>		
Married	1,326 (44.1%)	6,068 (58.4%)
Not Married	1,679 (55.9%)	4,332 (41.7%)
<b>Employment Status</b>		
Employed	1,694 (82.6%)	6,463 (90.9%)
Unemployed	356 (17.4%)	648 (9.1%)
<b>Age</b>		
18-65	2,680 (88.7%)	8,768 (83.7%)
65+	341 (11.3%)	1,711 (16.3%)
<b>Education Level</b>		
HS Graduate	1,414 (47.0%)	8,085 (77.8%)
Did not Graduate	1,592 (53.0%)	2,310 (22.2%)
<b>Income</b>		
Above FPL	2,178 (81.8%)	8,169 (90.6%)
Below FPL	485 (18.2%)	850 (9.4%)

	NHOPI (N=3,021)	Asian (N=10,479)
	n(%)	n(%)
<b>Lifestyle and Behavioral Factors</b>		
Obesity	2,039 (71.0%)	4,211 (42.6%)
Smoking	710 (24.0%)	965 (9.5%)
Heavy Drinking	223 (7.8%)	331 (3.4%)
<b>Self-Reported Health Status</b>		
Good or Better	2,333 (77.5%)	9,286 (88.9%)
Fair or Poor	679 (22.5%)	1,163 (11.1%)
<b>Prior Diagnoses Factors</b>		
Diabetes	327 (10.9%)	856 (8.2%)
Coronary Heart Disease	122 (4.1%)	239 (2.3%)
Depression	372 (12.4%)	751 (7.2%)
Kidney Disease	124 (4.1%)	204 (2.0%)
Heart Attack	143 (4.8%)	238 (2.3%)
Stroke	100 (3.3%)	198 (1.9%)

		Personal Health Care Provider	Experience of a Cost Barrier	Annual Routine Checkup
		n(%)	n(%)	n(%)
Insured	Asian	7,614 (84.0%)	733 (8.1%)**	6,321 (71.7%)
	NHOPI	2,058 (84.0%)	361 (14.7%)**	1,721 (71.1%)
Uninsured	Asian	567 (43.3%)	432 (33.1%)**	573 (46.8%)*
	NHOPI	222 (42.0%)	221 (41.4%)**	208 (40.9%)*

\* $P<.05$ , \*\* $P<.001$

Table 4. The Odds of Experiencing Fair or Poor Health among Those with Health Insurance Coverage After adjusting for Each Summary Variable for Insured NHOPI Compared to Insured Asians						
	Unadjusted			Adjusted		
	OR	P-value	95% CI	OR	P-value	95% CI
<b>Demographic Factors (n=11,465)</b>						
Odds NHOPI (compared to Asians)	2.38	.000	(2.12, 2.67)	2.57	.000	(2.27, 2.90)
Female				0.86	.008	(0.76, 0.96)
Age				1.03	.000	(1.03, 1.04)
Married				0.77	.000	(0.69, 0.86)
<b>Socioeconomic Status (n=6,983)</b>						
Odds NHOPI (compared to Asians)	2.38	.000	(2.12, 2.67)	1.90	.000	(1.59, 2.28)
Employed				0.54	.000	(0.42, 0.69)
< HS Education				1.74	.000	(1.45, 2.09)
Income < FPL				2.07	.000	(1.59, 2.70)
<b>History of Disease (n=11,238)</b>						
Odds NHOPI (compared to Asians)	2.38	.000	(2.12, 2.67)	2.06	.000	(1.81, 2.34)
Diabetes				3.85	.000	(3.29, 4.49)
Coronary Heart Disease				1.89	.000	(1.38, 2.59)
Depression				2.98	.000	(2.52, 3.53)
Kidney Disease				3.57	.000	(2.72, 4.69)
Heart Attack				1.51	.011	(1.10, 2.09)
Stroke				2.69	.000	(1.98, 3.66)
<b>Lifestyle Factors (n=10,416)</b>						
Odds NHOPI (compared to Asians)	2.38	.000	(2.12, 2.67)	1.91	.000	(1.68, 2.17)
Obesity				1.60	.000	(1.42, 1.80)
Smoking				1.75	.000	(1.50, 2.05)
Heavy Drinking				0.62	.002	(0.46, 0.85)
<b>Access to Care (n=11,121)</b>						
Odds NHOPI (compared to Asians)	2.38	.000	(2.12, 2.67)	2.27	.000	(2.01, 2.56)
Health Care Provider				1.56	.000	(1.29, 1.87)
Annual Checkup				1.46	.000	(1.27, 1.67)
Cost Barrier				2.26	.000	(1.80, 2.45)

after adjusting for each group of summary variables. The unadjusted odds of insured NHOPI reporting fair or poor health as compared to Asians was 2.38 (95% CI: [2.12, 2.67]). The socioeconomic factors meaningfully reduced the self-reported health status odds ratio (OR) for insured NHOPI by 20.2%, as compared to Asians (OR: 1.90; 95% CI: [1.59, 2.28]). The same trend was shown for factors related to prior diagnosed diseases with a 13.4% reduction (OR: 2.06; 95% CI: [1.81, 2.34]), lifestyle and behavioral factors with a 19.7% reduction (OR: 1.91; 95% CI: [1.68, 2.17]), and access to healthcare with a 4.6% reduction (OR: 2.27; 95% CI: [2.01, 2.56]). Adjusting for demographic factors increased the odds of NHOPI reporting fair or poor health as compared to Asians (OR: 2.57; 95% CI: [2.27, 2.90]).

Table 5 demonstrates the final model after adjusting for all four groups of summary variables. The unadjusted odds ratio of experiencing a healthcare cost barrier for insured NHOPI compared to insured Asians was 2.38 (95% CI: [2.12, 2.67]). After controlling for demographic factors, socioeconomic status, lifestyle and behavior factors, access to healthcare, and history of prior diagnosed diseases, the fully adjusted odds of reporting fair or poor health among those NHOPI with health insurance coverage was 1.66 (95% CI: [1.34, 2.05]).

## Discussion

This study examined the association between health insurance, an element for improved access to health care, other barriers to healthcare (cost, having a personal healthcare provider),

Table 5. The Odds of Experiencing Fair or Poor Health among Those with Health Insurance Coverage After Adjusting for All Summary Variables for Insured NHOPI Compared to Insured Asians						
N=6,130	Unadjusted			Adjusted		
	OR	P-value	95% CI	OR	P-value	95% CI
Odds NHOPI (compared to Asians)	2.38	.000	(2.12, 2.67)	1.66	.000	(1.34, 2.05)
<b>Demographic Factors</b>						
Female				0.75	.003	(0.62, 0.91)
Age				1.03	.000	(1.02, 1.03)
Married				0.99	.956	(0.82, 1.21)
<b>Socioeconomic Status</b>						
Employed				0.65	.003	(0.42, 0.69)
< HS Education				1.65	.000	(1.45, 2.09)
Income < FPL				2.02	.000	(1.59, 2.70)
<b>History of Disease</b>						
Diabetes				3.86	.000	(3.29, 4.49)
Coronary Heart Disease				1.75	.043	(1.38, 2.59)
Depression				2.45	.000	(2.52, 3.53)
Kidney Disease				3.27	.000	(2.72, 4.69)
Heart Attack				1.37	.275	(1.10, 2.09)
Stroke				2.27	.007	(1.98, 3.66)
<b>Lifestyle Factors</b>						
Obesity				1.32	.004	(1.42, 1.80)
Smoking				1.52	.000	(1.50, 2.05)
Heavy Drinking				0.75	.159	(0.46, 0.85)
<b>Access to Care</b>						
Health Care Provider				1.17	.252	(0.89, 1.54)
Annual Checkup				1.15	.180	(0.94, 1.42)
Cost Barrier				1.64	.000	(1.27, 2.13)

and self-reported health status between Native Hawaiians and Other Pacific Islanders (NHOPI) and Asians using national BRFSS data. Insured NHOPI were more likely to experience a cost barrier than insured Asians although there was no difference between groups in regard to having a personal healthcare provider. Additionally, uninsured NHOPI were less likely to receive an annual routine checkup as opposed to uninsured Asians. These initial findings confirm that health disparities do exist and are substantiated in NHOPI populations, regardless of health insurance status and if they have a healthcare provider. Likewise, there are significant associations between ethnicity and self-reported health status among insured NHOPI and Asians (OR: 2.38, 95% CI [2.12, 2.67]). These relationships were slightly attenuated, yet still significant, after sequential cumulative adjustment for patient characteristics. This indicates that by individually controlling for socioeconomic factors, history of disease, lifestyle and behavioral factors, and access to healthcare the difference between insured NHOPI and Asians reporting fair or poor health is decreased but not equal. When all those factors are taken into account, insured NHOPI

were still 66% more likely to experience fair or poor health as compared to Asians (OR: 1.66, 95% CI [1.34, 2.05]). This indicates that policy makers and healthcare professionals must acknowledge that although having health insurance increases likelihood of having a health care provider and participating in an annual check up, it is not the entire solution or “magic pill” in eliminating health disparities.

As ethnic minorities, NHOPI often experience social marginalization and racial discrimination in the healthcare setting resulting in poor health outcomes.<sup>5,6,11-13</sup> Deficiencies in cultural competency, local language skills and communication, as well as conflicting perceptions, attitudes, beliefs, and values toward health and healthcare pose as significant barriers to accessing care. Obtaining health insurance coverage addresses individuals’ ability to pay for health services, but health professionals must consider a broader approach to healing to address health outcomes. These social and cultural barriers are confounded by barriers of accessibility and availability of quality healthcare services, thus, worsening health disparities for NHOPI.

Additionally, the results of this study support existing research showing that a higher proportion of Native Hawaiians and Other Pacific Islanders (NHOPI) suffer greater health disparities, health risk behaviors, and lower socioeconomic status when compared to Asians.<sup>2-6</sup> This ethnic group has experienced a unique sociopolitical history, and patient utilization and poor health are complicated by the unique cultural and social contexts of NHOPI. Furthermore, findings from this study confirm previous reports stating the importance of utilizing disaggregated data in health research and surveillance in order to effectively identify and address health disparities in this population.<sup>14,15</sup> Continued aggregation of Asians with NHOPI creates an inflation of health outcomes and masks the underlying health inequity of the NHOPI population.<sup>14,15</sup>

## Conclusion

Scholars have recommended mechanisms to address healthcare barriers. For example, minority physicians are more likely to serve in a medically underserved area.<sup>16,17</sup> These physicians are successful because they carry similar perspectives in regards to health and wellness and have the ability to tailor health services that are deemed appropriate and acceptable by patients. Several studies have demonstrated a particular correlation between the ethnic concordance (e.g. having a Native Hawaiian or Pacific Islander physician caring for a Native Hawaiian or Pacific Islander patient, respectively) of patient-physician interactions and a number of positive patient-related outcomes, such as satisfaction, provider preference, and quality of care.<sup>18,19</sup> NHOPI physicians address all of the provider level barriers to accessing health care relating to judgmental behavior, differing language, and a lack of communication skills, communication style, and cultural knowledge resulting in a stronger patient-provider relationship.<sup>14</sup> Because NHOPI physicians carry similar perspectives in regards to health and wellness, they can develop accountability and trust with patients to prevent stigma, marginalization, condescendence, and insensitivity associated with minority populations.<sup>5,6,14</sup>

In order to ameliorate health disparities evident in NHOPI populations, the authors suggests several recommendations to improve health care access and positive health outcomes for NHOPIs: (1) increasing the number of NHOPI physician applicants, graduate and residency programs, (2) expanding

health care in rural areas and neighbor islands, (3) providing financial support for additional direct and indirect costs to obtaining medical care, and (4) incorporating 'cultural safety' or cultural sensitivity into medical training. Establishing equity in our healthcare system is something we should all strive for. Providers should aim to serve their patients with care that is appropriate for them and create acceptable medicine that is inclusive rather than exclusive. Future studies should investigate the effectiveness of these strategies to address the unique needs of NHOPI in the health care setting.

There are limitations associated with the BRFSS data set such as data collection protocol as random-digit dial telephone survey that limits participation to those with a household telephone in a service coverage area. Due to the vulnerability and high-risk behaviors associated with some of the questions asked in the BRFSS, self-report biases including social desirability effect and self-evaluation bias as an underrepresentation limit the generalization of the findings. Additionally, the racial categories of Asian and NHOPI represent a heterogeneous group of distinct subpopulations that have unique languages, cultures, and practices that may reflect differences in socio-demographic factors, lifestyle factors and healthcare coverage, access, and utilization. Due to the limitations stated above, the findings from this study are limited to those participants of the BRFSS 2012 survey and may serve as an underestimation of the actual counts. However, this study group can be used as a starting point to determine where further research and greater exploration can be done to better understand the disparities in health care access, barriers, and utilization.

## Conflict of Interest

None of the authors identify a conflict of interest.

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# Obamacare: A View From the Outside

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## Introduction

The “Affordable Care Act” (Obamacare) legislated in 2010 and implemented on January 1, 2014, aims at reducing health care costs while increasing the American population’s health-care coverage in the private and public insurance sectors by requiring that everyone purchase health insurance. To better understand the impact of the Affordable Care Act (ACA) on the United States healthcare system, medical students from Switzerland interviewed 14 local health experts who work in diverse healthcare settings. Their reflections are summarized here to give us an idea of what they learned regarding the actual impact these legislative changes have had both nationally and locally. These reflections are also viewed through the lens of Switzerland’s healthcare system.

## Aims of the ACA

Key implementation measures of the ACA aim to greatly increase the number of Americans who have access to affordable health insurance. This is done by prohibiting insurance companies from setting the price of insurance premiums according to their client’s health, pre-existing medical conditions (excluding tobacco smokers), gender, or refusing clients based on those factors. With the ACA only age and area of residence may be taken into account when determining an individual’s insurance coverage. The ACA also expands Medicaid and provides tax credits to small employers who cover their employees. Businesses with over 50 employees are required to provide health insurance to their workforce. Under the ACA there is a \$750 annual fine for uninsured people who do not purchase health insurance, and insurance companies are required to spend the majority of health insurance premiums on medical care, not on profits and overhead.<sup>1</sup>

The requirement that all citizens have health insurance, and must pay into the healthcare system that cares for them, has been a contentious issue. The premise is that the expansion of those purchasing insurance provides more money to cover costs as well as increases access to healthcare, improving this country’s economic equilibrium overtime. Other measures, like the increased scope of eligibility to Medicare and Medicaid, along with the allocation of subsidies to people in need, promotes accessibility to healthcare for people in precarious social or financial situations.

Some think the ACA law has succeeded. Indeed, it is impressive that by May 2014 over 20 million previously uninsured Americans now have health insurance. The ACA’s major coverage provisions went into effect in January 2014 and have led to significant coverage gains. As of the end of 2015, the

number of uninsured nonelderly Americans stood at 28.5 million, a decrease of nearly 13 million since 2013.<sup>2</sup> However, in our interviews with local health experts some of the problems with this legislative effort are presented.

## Unintended Consequences on Physicians and Patients

As noted earlier, 14 local healthcare experts from diverse provider settings were interviewed and several issues were noted regarding the impact of the ACA in Hawai‘i. For example, Family Health Centers as well as Community Health Centers find themselves overwhelmed with the influx of newly insured Americans who finally have the opportunity to see a doctor after years of being uninsured. Additionally, despite the improvements in accessibility to Medicare or Medicaid resources, these patients often find themselves in difficult circumstances if they choose to see a private doctor, as only a limited amount is actually reimbursed by the insurance. A primary care physician (PCP) working in a federally qualified health center (FQHC) in Hawai‘i whose patients are mostly indigenous to the islands reports that even for patients that have Medicaid or MedQuest it can often be difficult to access primary care physicians due to Medicaid currently paying very low amounts for patients to be seen by private practitioners. By low reimbursement amounts, a private practice PCP described how his office receives only eight dollars for a primary care visit which he views as unsustainable. Another PCP from a local FQHC added that such low payments do not begin to address the reality that health care depends not only on doctors but on a healthcare team including nurses, paramedics, and medical assistants. In the end, such small reimbursement rates have led a number of PCP’s to refuse seeing Medicaid patients, forcing some to visit over-crowded FQHCs. Against the ambitions of the ACA to deliver real progress concerning health coverage to the population, only a small step forward. Improvements in terms of patient benefits and access to healthcare remain modest.

With the technological progress in medicine and the requirement to establish patient follow up, several doctors report their administrative work load (sending phone calls, emails, filling in insurance forms, reading patient files, etc) increasing by as much as 40%. The sheer volume of various procedures required by insurers has become time consuming and frustrating for doctors. Given each patient has his own insurance, which in turn has its own procedures, forms and pricing system has added to the complexity of care. Doctors are only paid when they see patients. Therefore, time spent on office administrative tasks is unpaid time that also prevents doctors from being available

to serve other patients. In order to avoid this paperwork, some medical practitioners have resorted to accepting cash only payments, thus neither participating in the reform, nor in the insurance system in general.

Legal disputes between insurers can also negatively impact both doctors and patients. Doctors who treat patients after a work-related or automobile accident often have to deal with the legal struggle between the various insurance companies who cover costs depending on the place or circumstance of an accident, or pre-existing conditions of the patient. This struggle is clearly articulated by Dr. Scott McCaffrey, the president of the Hawai'i Medical Association (HMA).

"I have spent too much time hearing and arguing with administrative judges about these three parameters [place, circumstance and preexisting conditions]. The legal system is built around this resulting in the attorneys making a great deal of money. Meanwhile, the poor patients stay at home injured with whatever malady has befallen him or her and sometimes without any care option at all, unable to access accurate diagnoses or treatment. So, it is very difficult to be a doctor who believes in the ethics of Hippocrates and is dedicated to the patient rather than to such a legal environment as this"

Ultimately, the time spent and the administrative costs result in an increase in the price of healthcare services. McCaffrey states that the costs of a legal conflict can amount to \$5,000 per hour which could have been better spent on timely diagnosis and treatment thus increasing the probability of the patient being able to return to work sooner. As a consequence of this, doctors tend to refuse patients who have suffered accidents.

From our perspective, the United States has developed highly innovative healthcare products and technological procedures. As this technology is created and benefits many it also increases healthcare costs. Thus the US has inadvertently created a two-tiered healthcare system; one that is highly innovative yet quite inefficient and costly. Instead of separating different healthcare providers such as doctors, hospitals and pharmacies, the goal should be to make them a continuum directed at meeting the patient's needs notably in terms of both access to quality health care as well as efficiency.

### **Where are the United States Primary Care Physicians?**

The current United States healthcare system lacks a sufficient number of primary care physicians, which is also an issue in other countries such as Switzerland. One explanation for this lack of PCPs in the United States is the inclination of American medical students to pursue careers in specialized medicine they provide higher salaries. This is understandable as large loans are needed to pay the high tuition costs required to attend American universities, resulting in years of trying to debt. According to the American Association of Medical Colleges, the accumulated education debt of a medical student generally averages between \$180,000 to \$200,000 total.<sup>3</sup> In contrast, Switzerland provides medical studies that only cost about \$1,100 per year in US dol-

lars.<sup>4</sup> Additionally, in the United States, the salaries of surgeons and specialists are much higher than those of PCPs. One reason is that the more a medical practitioner uses technology the more income is generated for the entire healthcare system. One doctor we interviewed communicated: "this problem is amplified by the patients and their insatiable desire to be treated by the latest and best treatment which may not be required."

### **Powerful Interest Groups**

As one state leader responsible for improving Hawai'i's healthcare system pointed out, "one problem with the American healthcare system is that it is structured to benefit healthcare insurance [companies] rather than the health needs of patients." In this context, the insurance companies have little incentive to change the healthcare system. Against this background, another obstacle to the implementation of the ACA reform resides in the operation of powerful interest groups. Health insurance companies in the United States are numerous and represent a powerful lobby in politics. These companies can strongly interfere with reform implementation, set prices and make profit on almost everything, including basic insurance plans. They enjoy a comfortable position in the current system and it is clear that they do not see much benefit to ACA reform on the premise that it will decrease their profit. They only increase their rates and their income when, alternatively, patients would be better served if the insurance companies would spend more on answering the basic question of how do we improve healthcare? Similarly, pharmaceutical companies are a powerful force. Some feel, therefore that the pharmaceutical companies are benefitting the most from the current US healthcare system, instead of the patients.

Compared to pharmaceutical interests and insurance companies, healthcare practitioners have less access to influencing system-wide change in healthcare. Notably, doctors are not granted the right to organize and negotiate which undermines their ability to craft solutions for improving the healthcare system. Moreover, instead of uniting to form one entity, healthcare providers are separated from each other as they try to impose their view or preferences for the healthcare system through their lawyers. In short, the ability of doctors to induce progress in the American healthcare system is overpowered by other, more powerful interests.

### **Conclusion**

In conclusion, despite criticism and though it remains imperfect, the reforms implemented by President Obama under the ACA offer a first sign of hope for the American healthcare system to become fair and accessible to all Americans. The new measures for Medicare and Medicaid are a start, however other factors like health insurance and pharmaceutical challenges, continue to prevent the United States from having a healthcare system that provides equal quality access for all. Therefore, the investment in Obamacare may have very limited results. One healthcare administrator suggests that a larger national political ideology hinders the path to this ideal: "Many of the politics/political

players in the United States are not really focused on the good of society. It is a very individualistic place and people are expected to sink or swim by their own devices. We are not big in helping people who need help.”

To a group of students from Switzerland, where personal health insurance is mandated for all citizens, and physicians accept the state payments, it seems clear to us that the ACA is a step forward, but further healthcare reform is needed in the United States. In addition to giving greater influence to healthcare providers, an investment in the public health infrastructure and preventative health measures would also likely improve the health of many citizens and could decrease overall healthcare costs over time.

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None of the authors identify any conflict of interest.

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# MD 5 Big Island Adventures: The Challenges and Rewards of Rural Physician Practices

Quinn Ng PhD

While born in Hawai'i and living in Honolulu for most of my life, I did not have many opportunities to visit the neighbor islands. I was blessed with the opportunity to visit the Big Island during my first summer of medical school (MD5). Away from all the hustle and bustle of the city, I stayed in a quaint little boathouse (on land) at Captain Cook. I primed myself for a summer of shadowing physicians on the Big Island along with experiencing the joys and challenges of working in smaller communities. To gain a broader view of the different aspects of healthcare, I shadowed physicians at the Kona Community Hospital, at a private practice in Kona, and at the West Hawai'i Community Health Center.

## Stop 1: Community Hospital

My first stop was at the Kona Community Hospital where I followed radiologists, radiation oncologists, and oncologists. This small community hospital had a wide variety of specialists, nurses, and staff who keep things running smoothly and efficiently. The physicians I spoke with all enjoyed working at the hospital due to its set working hours, job security, and more centralized administration/billing services – all benefits of working in a larger institution. Interestingly, among the physicians that I had the chance to work with, many of the specialists belonged to separate physician groups contracted by the hospital. Depending on the hospital, more hospitalists may be employed or services sought through contracts with private physician groups. Working at this hospital also meant regular access and collaboration with other specialists as needed. For example, when one of the radiation oncologists had questions, pathology and radiology resources were just down the hall enabling us to simply walk over and talk face-to-face with them.

I quickly discovered that one drawback in working on a neighbor island is the smaller number of physicians. Specialists are fewer or entirely unavailable as doctors retire or move with no one to replace them. I was surprised, for instance, to see one of my Professors substituting for the hospital's regular pathologist who was on vacation for the week. I also shadowed an oncologist who was there as a *locum tenens* (a Latin phrase meaning "to hold the place of, to substitute for") as the previous specialist had moved. Originally from the mainland, he said *locum tenens* gave him a good chance to experience working at a hospital with only a short-term commitment to see how he liked it before hopefully being offered a position. This strategy also assisted the hospital in its struggle to recruit adequate numbers of physicians to work there. With the physician shortage, some patients must fly to Honolulu for consults or to continue their care. In some cases, insurance companies opt to fly patients

over if the treatments are less expensive. Even with access to telemedicine, I don't think anything can fully replace direct contact between patient and physician.

Given the smaller number of physicians working at the hospital, they are pressed to expand their knowledge and skills sets to meet the populations health needs. When faced with any problem, they are the ones that need to respond if possible since the only other alternative is to fly patients to Honolulu. Although this makes their workload broader and more intensive, many enjoy the experience of seeing more diverse medical problems and intervening which they normally wouldn't have the chance to do. Such a tradeoff for these physicians makes working in more rural areas on neighbor islands an ideal place for broad training and experience.

## Stop 2: Private Practice

My next stop was shadowing a pediatrician working in a private practice just outside the Kona Community hospital. Compared to the hospital, the private practice was faster-paced with fully packed schedules. On some days, he was also on call and would go back and forth between his practice and the hospital. When I asked what he liked most about working in private practice, he declared that he enjoys being his own boss and free to do as he pleased. Because there are no set schedules in private practice, he could spend as much time as he believed was required to provide quality care for each patient, including seeing a patient after hours if needed. There was also no administration to tell him what to do. He also noted the downside of private practice which essentially involves keeping your own business cost effective. With several support staff and a nurse, maintaining a large enough volume of patients to keep afloat in terms of finances can lead to very full schedules. There is also the impending risk of lawsuits that can devastate a small private practice. In larger hospitals, the hospitals themselves have malpractice insurance to cover their physicians – shielding physicians from sole responsibility. Moreover, it has been increasingly difficult for private practice physicians to stay afloat under the newly implemented Affordable Care Act (ACA).

Often, the reimbursement for Medicaid patients is so low under the ACA that some physicians "cherry-pick" patients—which means they avoid seeing patients with Medicaid or Quest. I was proud to hear that the person I was shadowing tried not to turn away patients. Being one of the few pediatricians in the area, it was important for him to support the community as best as he could, despite incurring financial losses. In fact, up to 80% of his patients were on Medicaid, which approaches the same rate as many federally funded clinics. Unfortunately, this is

harder on private practice physicians since they do not get the additional federal funding per patient that health centers do. Like other physicians that I spoke with in a private group at the hospital, many doctors of the previous generation had the dream of working for themselves. With all the new changes in healthcare, our generation seems to be pushed towards being doctors that will be working in larger groups or hospitals, such as a Kaiser Permanente, while the independent private practices start to fade. What people don't commonly understand is that for many patients, the decline of private practices combined with low Medicaid reimbursement rates often makes access to medical care more difficult, especially in emergency situations where patients are located far from any hospital. If no specialist is available nearby, nearly an hour is added to the time required to get patients to the airport when a flight to Honolulu is required. Many Medicaid patients also have difficulty securing transportation to a hospital on their own.

Shadowing a pediatrician was a very unique experience beyond my exposure to what community-minded private practice can look like. At the very core, I had the chance to experience the "art" of medicine, a practice that cannot be learned from books or in lectures during the academic year. In the field, I learned effective and efficient interactions that can make or break an appointment. With children, it was more about maintaining the interaction— how to encourage them to cooperate, to smile, or even just to get them to stop crying—in order to expedite a more effective exam. These interactions tell us the most about our patients and fostering strong relationships that are key to becoming great physicians.

### **Stop 3: Community Health Center**

My final stop was at the West Hawai'i Community Health Center, a federally funded, community based clinic in downtown Kona. Since it is federally funded, the health center does not turn away any prospective patients. In addition to physicians, there were many nurses and support staff with more specific roles in helping the clinic function, such as scheduling, rooming patients, entering medications, and checking-in patients. The center had a lab area for performing basic tests, a mini pharmacy room, and many exam rooms. Small surgical procedures could be done at the health center, which enabled fewer hospital transfers. The clinic was much different from the hospital and

the private practice in that many physician assistants (PAs) provided support. Here, I had the chance to shadow one of the family medicine physicians as well as one of the PAs.

I found that much of the work of the PA was similar to that of the physicians. Talking with the physicians and PAs, I also found that there were many benefits to working in a community health center. One of them is the issue of liability. Unlike private practices and hospitals, the federal government takes over in the case of any lawsuits. This provides superior protection for workers at the health center. There are also loan repayment programs, which make it very attractive to work there. However, the turnover rate of physicians is much higher than at hospitals and they have difficulty retaining physicians. Overall, in my estimation, the health center had a good approach to community health services. For instance, in addition to medical care, there are in-house behavioral specialists and psychologists available to address behavioral health issues. I believe this is an important quality because many patients also have behavioral health related problems. Having these services in-house allows for the easy, "warm handoff" of patients, rather than losing them to referral or follow-up.

In conclusion, my trip to the Big Island was a great learning experience. There are many different flavors of healthcare that can be provided, such as a hospital providing comprehensive healthcare, a private practice providing outpatient visits, and a community health center supporting the community at large. Each of the three places showed the vital role they play in our current care health of our communities. The ongoing physician shortage in Hawai'i continues to grow and there is an ever-important need for new physicians to practice in more remote locations, such as the neighbor islands. Even with all the challenges physicians face on the neighbor islands, the opportunities and experiences can be gratifying and endless.

### **Conflict of Interest**

The author identifies no conflicts of interest.

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# Important Factors To Consider When Developing Rural Healthcare Systems: Suggestions From A Moloka'i Native

Luke Kikukawa

In Hawai'i, rural healthcare can be limited and is often fragmented. Many rural areas lack health care providers as well as the resources to meet the needs of the populations in the community. Like many states with large rural populations, developing a healthcare system that is accessible and responsive to the needs of local communities requires change that is directed by the community, not just providers. It requires networks of providers and community leaders collaborating to identify needs, barriers and the resources to create a coordinated healthcare system.

While growing up on the rural island of Moloka'i, I witnessed my sister, Gen, wait for seven hours with both her ulna and radius protruding from her arm because the doctor on emergency duty was not confident enough to set her bones. Because my family was in-between insurance providers there was a delay in the medevac approval to send Gen to Queen's Medical Center on O'ahu where she could be treated by a physician with more specialized training. There is not enough funding for a permanent emergency room doctor in Moloka'i, which results in injured people waiting long periods of time before receiving medical attention. Of course, this small island is only one of many places in the world where communities lack immediate, direct access to quality healthcare. Fortunately, in Moloka'i we do have multiple options when choosing a family practitioner. However, the nearby small island of Lana'i is about to lose its only two physicians.

Rural Hawai'i is not the only place where residents struggle to gain access to healthcare. Some countries lack even the most basic health resources such as clean water, doctors, antiseptic techniques, or immunizations. For example, in many rural communities of India, hospitals and clinics are extremely limited, so locals are forced to rely on alternative practices. Thus, introducing and providing quality healthcare in these rural places can vary in countless ways. Whether a community needs a new hospital, a women's health clinic, an ambulance, a quarantine area, more medical supplies, or even an adjustment or realignment to community values, there are some key factors to consider when developing an effective healthcare system in rural and underserved locales.<sup>11</sup>

## Community Factors

When establishing healthcare in a rural location, the most important factor to consider is the community's uniqueness. A community can be defined by its geography, level of development, culture, population, demographics, economics, and politics. Given the manifold nature and nuances of these attributes, to truly understand a particular society it is important to do two

things. First, connect to the people of the community to develop an understanding of their needs. One must seek out knowledgeable locals and local leaders for guidance. Second, do research (eg, a survey, using local community forums) to appraise the community's unique location, level of development, view of medicine, traditional healthcare practices, social structure, and political and economic viability. Both of these approaches are needed to ensure that healthcare is designed to best meet the community's needs.

In Moloka'i there are many traditions Native Hawaiians take to heart, such as living sustainably and caring for the land, using indigenous plants with medicinal properties, performing *meles* (songs), chants, hula to tell stories, and practicing *lomilomi* (traditional Hawaiian massage). An understanding of traditional beliefs and practices can provide insight into how modern medicine might be uniquely integrated into such community practices. Sometimes it is possible for the integration to be done in a traditional way, other times a region's particular practices and beliefs run counter to established health and human service protocols and increase the potential for conflict. Research continues regarding which practices are complimentary versus contradictory.

The environment that surrounds a community can also vastly affect the delivery of healthcare. On Moloka'i, geographic isolation can be a barrier to healthcare access and delivery. The geographical features of the island include two volcanos and shallow ocean channels that limit transportation options (ie, roads or airports). To overcome such access barriers, one must also consider the costs. For example, on Moloka'i, the cost of medical transport via medevac airplane or helicopter can cost over \$10,000. Other less developed rural areas and even entire countries struggle with the same issue. Medevac can be essential if a patient is to arrive in a safe and timely manner to an appropriate medical facility.

Alongside social practices and environmental constraints, the economic and political aspects of a community may come into play with healthcare delivery. They also impact what type of healthcare system and services are available and who is serviced. The political and economic situation of a country or region can also have profound effects. For example, if a society is composed of mostly senior citizens, then there will be a demand for more care homes, elder care, and providers. Also, on Moloka'i, most people are strongly against tourist development and infrastructure because they want their island to stay quiet and serene. This makes it difficult to set up specialized health clinics, as the demand is low given the local population numbers. Instead, patients in need of a skin or heart exam have to wait

for the travelling dermatologist and cardiologist to make their monthly visit to Moloka'i. One local primary care physician invites these specialists to set up shop in his clinic while they care for some of his patients and others.

### Healthcare Workforce Education

The next set of factors to consider revolves around health providers in the community. The professionals involved in the actual delivery of health care need to be sensitive to a community's particular culture and needs. Often health providers who were raised in the community can lead this effort. Training needs to be ongoing in order to keep everyone up to date on recent advances and technological innovations. Further, there is a need for larger oversight and organization within regions in the event of large-scale contagion or emergencies. The Center for Disease Control is an example of one such organization that can best help a region if an existing framework is established.

Personnel needed to run hospitals, clinics, and other services include administrators, doctors (both generalists and specialists), emergency medical technicians (EMTs), nurses, orderlies, and security. Different communities will require different ratios and amounts of these positions. This all depends on that particular community's make-up and situation. For example, according to the US Census Bureau, there is a significantly higher percentage of senior citizens in Hawaii than the rest of the nation.<sup>2</sup> Hawai'i's health care system is currently trying to respond to this situation by training and incorporating more home care nurses and geriatricians.

### Material Factors

The availability of medical facilities, tools, and supplies can impact the quality of service provided in rural health settings. Tangible things such as hospital beds, operating rooms, and laboratories are needed. Imaging equipment, including X-ray machines, computerized axial tomography (CAT) scans, and magnetic resonance imaging (MRIs), is a basic requirement. Other essential equipment includes vital monitoring machines, respirators, defibrillators, and autoclaves. Medical supplies such as drapes, trays, gloves, scalpels, gauze, bandages, splints, and sutures, are also required. Medicine like antibiotics, opiates, coagulants, anti-inflammatories, vaccinations, IV fluids and blood also need to be in stock. Lastly, autoclaves, chemical products, and cleaning devices are imperative to health care. All of these material goods are an important part of modern medicine and are essential to high recovery rates from illness and injury.

Adequate service is possible if the material goods listed above are available and if the patient arrives to the medical facility in a timely window. Time in emergency situations is critical, hence medical transport vehicles must be added to this list. Ambulances (including ground and air) are needed to transport patients to facilities where safe, clean medical procedures can be undertaken.

While we do have resources available on Moloka'i, including imaging machinery, an EKG, a dialysis clinic, and a chemotherapy clinic, patients must travel to O'ahu for specialized care such as colonoscopies, surgeries, or psychiatric needs. Many medical facilities are unified under the Queen's Medical Center, which makes it easy to refer patients off-island and communicate through electronic medical record systems.

### Conclusion

Ultimately, three factors: a community's unique conditions, the availability of trained medical personnel, and tangibles, such as facilities and supplies, impact the delivery of high-quality health care. Each community has special traits. These needs, and constraints influence and determine what type of health care system should be developed. Efficient health care systems must be adaptive and responsive to short and long-term changes. Changes in such things as population demographics, political/economic/social/environmental events, and disease epidemics are the norm. This responsiveness to change is critical in both developed and nascent societies. Further studies in rural health care can provide a greater understanding of the interplay between these complex factors on the important issue of rural health care delivery upon which Moloka'i, and other places like it, depend.

### Conflict of Interest

The author has no conflict of interest.

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## Book Review: *Women At War*

Elsbeth Cameron Ritchie, Anne L. Naclerio (eds), New York, Oxford University Press, 2015

Reviewer: Leslie Hartley Gise MD

### Overview

We are all concerned about our soldiers and veterans but we actually know very little about the experiences of women in the military and as veterans. Because it is both a new and changing field, there are a lot of questions yet to be asked and many studies yet to be conducted. However, what we do know about women in war is widely covered in a new textbook by Elspeth Cameron Ritchie and Anne L. Naclerio, titled *Women at War*. Although my areas of expertise include stress, psychological trauma and women working in a man's world, I not only learned a lot from this book, my consciousness and interest were raised.

To give a general sense of the scope of the textbook, the book is divided into 5 sections: background, women at war, what happens to women when they come home from the war, psychological issues, and veteran issues. Of the 40 authors, four are psychiatrists, and 15 are mental health professionals. Despite the fact that there are so many authors, the book holds together very well and there is little redundancy.

Directed at clinicians who care for women who are or who have been in the military, most of the chapters are relatively short, 10 to 20 pages, and very readable. Moreover, the brevity of the chapters in no way undermines their value as a resource. The contributing authors provide extensive references to back up their substantive arguments and point to further reading on the subjects being covered. For example, the chapter on the prevention of malaria concludes with nine pages of references and the very informative chapter on traumatic brain injury provides ten pages of references. In addition to offering a fascinating history of women in the military going back to the Revolutionary War, the editors also add a somewhat international perspective by including a chapter on women who served in the Australian military. Although only successful in this single chapter from Australia, the comparison is useful because the recognition of women in the military "...has not yet entered mainstream Australian society, and female military service remains largely 'invisible'" (Ritchie & Neclerio, p 44).

Some facts regarding women who have served are presented along side those who were not technically in combat roles. One example worth noting is the data on women in combat. Women comprise 15% of the United States (US) military but they have only recently been allowed into combat roles. Nevertheless, women who are technically not in combat roles are frequently involved in firefights. The psychological impact of serving in combat does not appear to vary according to gender. Compared to the civilian population, women in the military have the same rates of combat-related PTSD as men. With regard to women home from war, "one infantry Soldier said, simply, "My eyes

have witnessed more than my soul can handle"... [Training involves] "the over-rehearsal of combat skills" and "once over-learned, it takes time for this conditioning to be unlearned" (p 163).

### Gender-specific Traumas and Health Challenges

Other facts presented offer a profile of the multiple physical traumas women soldiers experience that are unique to their gender. Rates of sexual trauma among women who are deployed are also higher than in civilian samples. In fact, stressors for women in the military are more often related to sexual assault than combat. Women in the military have a threefold increased risk for suicide as compared to civilian women and the risk continues after discharge. Almost 90% did not have a history of deployment. One to two military women die by suicide every month, 75% by drug overdose. Common precipitants are failed and/or abusive relationships. Although military women are less likely to report intimate partner violence than civilian women, the rates of such intimate partner violence are higher among military women than among civilian women. Military women are less likely to report than civilian women. In 2006, the US Department of Veterans Affairs (VA) established a Military Support Team to address military sexual trauma through an impressive program of education, screening, and outreach.

The authors point out that the military health service is relatively well equipped to handle trauma and other conditions that are not gender based, but unfortunately "the care women Service members are receiving for common female conditions are left wanting" (p 712). The most common medical conditions that affect women are the same conditions that affect men (p 67): musculoskeletal complaints and upper respiratory infections. Medical issues more specific to women include "how to urinate privately and safely in the field, or how to dispose of feminine hygiene products" (p 50). Military gear also makes it cumbersome to urinate and there is no privacy, so women wear diapers and withhold fluids which increase the risk for heat injuries and urinary tract infections. Almost 50% of Army women experience a urinary tract infection; a figure 20 times greater than that for deployed men. Vaginitis is another common problem among females in the field and more research is needed to determine if uniform modifications would increase airflow, decrease friction, and decrease the risk of genitourinary infection. Menstruation is often handled by using oral contraceptives with withdrawal bleeding four times a year (p 59).

Contraception is another issue and the rate of unplanned pregnancy is double that of the general population. There are

advantages to implants and intrauterine devices but many women stop using birth control when they deploy, must change their birth control methods, or have access issues. Given that pregnancy termination services are not available to military women, the fact that more women are hospitalized for labor and delivery than for any other condition (p 81) is not surprising. Beyond “common female conditions,” issues in the prevention of malaria for women at war are complex, including psychiatric side effects, interactions with hormonal contraception, and risks of birth defects. As more women are assigned to combat roles, we can expect the incidence of traumatic brain injuries to increase. Among women veterans of Afghanistan and Iraq receiving care in the VA, 13% screened positive for traumatic brain injury.

## **Conclusion**

As I noted early in this review, I learned a great deal about the experience of women in the military from this book and my consciousness was raised. My only criticism is that despite the authors’ attempts at providing definitions for key terms, the book would have been stronger if a list of acronyms and their definitions were offered. In addition to my strong recommendation of this new textbook, the VA offers online course modules on military culture [www.deploymentpsych.org/military-culture](http://www.deploymentpsych.org/military-culture). We should all take them.

## **Conflict of Interest**

The author identified no conflicts of interest.

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