

Migration Analysis of Physicians Practicing in Hawai'i from 2009-2011

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Abstract

Background: Hawai'i suffers a 20% shortage of physicians. Examining physician migration patterns into and out of Hawai'i may better inform physician recruitment and retention techniques.

Methods: 2009-2011 practice location data on all non-military, practicing physicians in Hawai'i were compiled in a database maintained by the University of Hawai'i John A Burns School of Medicine, Area Health Education Center (AHEC). Medical school attended was extracted from an AMA Masterfile list. Physicians were contacted or searched online to ascertain practice location as of September 2011.

Results: Currently 3,187 physicians actively practice in Hawai'i; 2,707 (84.9%) trained at a total of 136 US medical schools. Nearly half of all US-trained physicians attended medical school in Hawai'i, California, New York, Illinois, or Pennsylvania. International medical graduates represented 191 medical schools from 67 distinct countries, primarily in the Philippines (23.1%). From 2009-2011, 238 physicians retired from clinical activity, and 329 physicians left Hawai'i to practice in other locations. California received the largest portion of Hawai'i's former physicians (26.4%). Only 15.5% of physicians returned to the state where they attended medical school.

Discussion: Medical schools with some of the most alumni practicing in Hawai'i (eg, Creighton, UCLA, Georgetown) all have active Hawai'i student clubs, suggesting a target for recruitment efforts. Physician emigration cannot be fully explained by geography of a physician's medical school alma mater. Analysis of physician residency locations and exit surveys of physicians leaving Hawai'i are recommended for future study.

Background

Hawai'i currently has a shortage of 600 physicians, or 20% of the total physician workforce.¹ A growing and aging patient population, coupled with the fifth oldest physician workforce in the United States,² makes Hawai'i's physician shortfall poised to worsen. Without significant changes in the medical delivery system, the effectiveness of physician recruitment and retention and/or the number of physicians trained in-state, Hawai'i will face an estimated shortfall of 1,600 physicians—more than 60% of the current workforce—by the year 2020.¹

The John A. Burns School of Medicine (JABSOM) Hawai'i/Pacific Basin Area Health Education Center (AHEC) is working to support the state's efforts to optimize physician recruitment and retention.^{3,4} These efforts are far from straightforward, as there are many determinants of a physician's selection of his or her practice location.^{1,4,9} Prior research has indicated that the site of a physician's residency is the most important variable in predicting the physician's first practice location.⁷ Moreover, a significant proportion of physicians stay in the same area and state where they first set up their practice.¹⁰

These principles have not fully materialized for Hawai'i, however, perhaps because of its unique cultural, geographic, and practice settings.^{1,4,6} While Hawai'i has the highest retention of physicians who completed both medical school and residency in-state, it ranks in the bottom quintile of states for retention

of physicians who completed only their residency in-state.² Researchers have used this data to promote increased numbers of JABSOM students,^{1,4} as well as support the Waianae campus of the A.T. Still University of Osteopathic Medicine in Arizona, whose inaugural class graduated in May 2011.¹¹ Additionally, AHEC researchers have begun to note the physicians who come to practice in Hawai'i and those who leave, which may better inform physician recruitment and retention techniques. With the objective to identify physician migration patterns into and out of Hawai'i, the following study was undertaken.

Methods

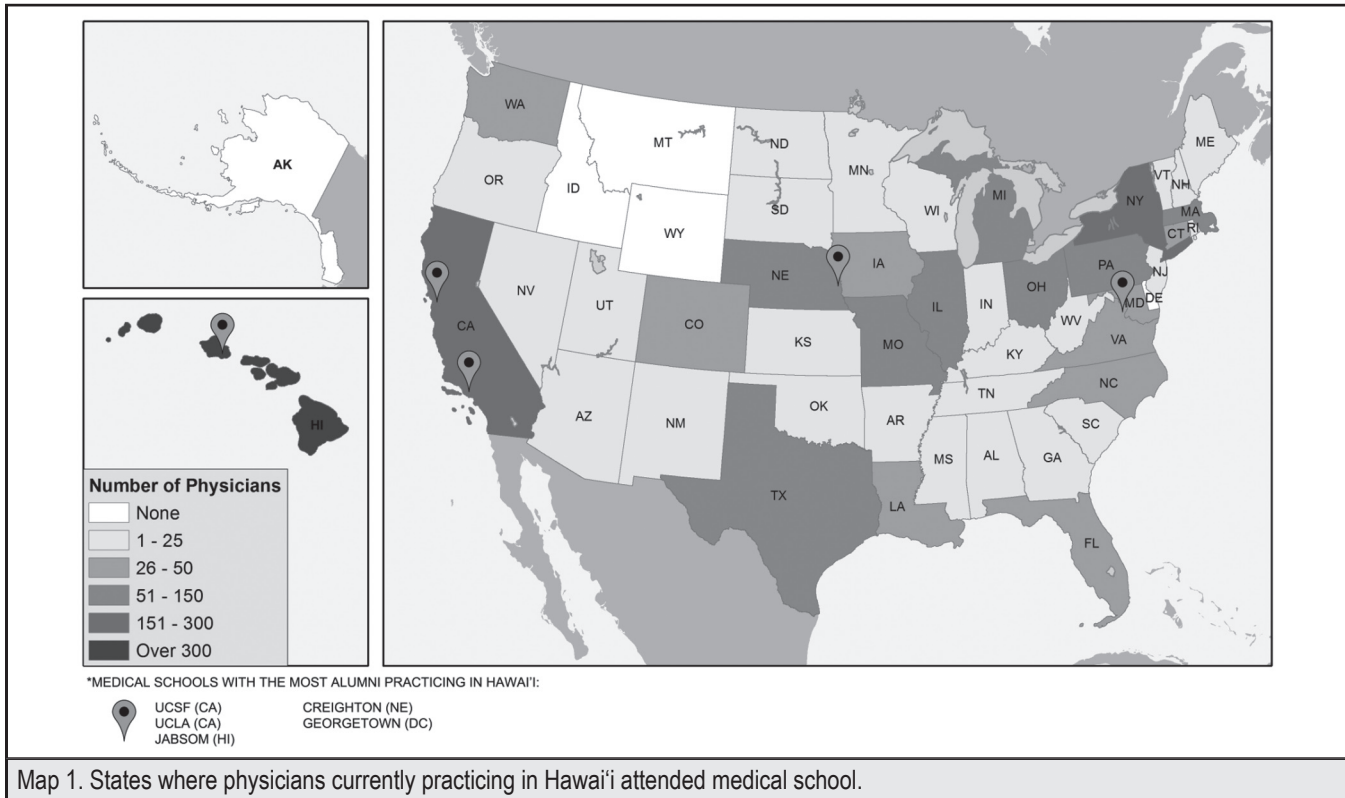
This study examined data from AHEC's secure database of all health care workers actively practicing in Hawai'i, including those in private practice. The list was generated in 2009 and 2010 from the Hawai'i Board of Medical Examiners' (HBME) license renewal data. During the renewal process, physicians could also volunteer information about their specialty and practice location in an AHEC-designed survey. Only non-military allopathic and osteopathic physicians were included in this study. Resident physicians and other health care professionals (eg, physician assistants and nurse practitioners) were excluded.

The medical schools at which the database's physicians trained were electronically retrieved from the 2008 American Medical Association Masterfile. Not all licensed physicians are captured in the Masterfile,¹² including a small portion of osteopathic physicians in this study and women whose surnames changed since graduation. In these cases, physicians were contacted by telephone at their listed practice locations and/or they were researched on the Internet. Because websites listing physicians' background information varied in how recently they were updated, search data were triangulated among multiple sites (eg, hospital directories, health insurance lists of network providers, and third-party physician evaluation websites). Internet searches and telephone calls were employed to ascertain each physician's practice location as of September 2011. Physicians whose location could not be verified either in Hawai'i or elsewhere were categorized as "unknown."

Results

As of September 2011, there were 3,187 physicians actively practicing in Hawai'i. Of these, 2,707 (84.9%) trained at 136 distinct US medical schools, 2,615 (96.5%) of whom attended one of 119 represented allopathic institutions, and 92 (3.4%) attended one of 17 represented osteopathic institutions (Table 1). Every state with a medical school was represented, as well as the District of Columbia and Puerto Rico (Map 1). Alaska, Idaho, Montana, and Wyoming are not represented because they

Table 1. Physicians currently practicing in Hawai'i.		
	Number of physicians	Percent
Total physicians practicing in Hawai'i	3,187	-
US-trained physicians	2,707	84.9
Allopathic physicians	2,615	82.1
Osteopathic physicians	92	2.9
Internationally-trained physicians	480	15.1



Map 1. States where physicians currently practicing in Hawai'i attended medical school.

participate in the Washington, Wyoming, Alaska, Montana, Idaho regional medical education program, which is partnered with the University of Washington School of Medicine.¹³ Delaware, too, has no in-state medical school but participates in the Delaware Health Sciences Alliance with Thomas Jefferson-Jefferson Medical College in Pennsylvania.¹⁴

The state of Hawai'i trained the most physicians (Table 2), with its graduates from the University of Hawai'i John A. Burns School of Medicine (JABSOM) representing nearly one-third of all US-trained physicians and over 20% of all physicians practicing in Hawai'i (Table 3). California had the second-largest representation of physicians trained at its medical schools (7.7% of all physicians), followed by New York with its medical graduates representing 5.1% of all practicing physicians in Hawai'i. Nearly 49% of all physicians practicing in Hawai'i trained at medical schools in just five states (Hawai'i, California, New York, Illinois, and Pennsylvania); over one-third of them trained at just five US medical schools (JABSOM, Creighton,

University of California Los Angeles, University of California San Francisco, and Georgetown).

A total of 480 physicians (15.1%) graduated from international medical schools (Table 1). They trained at 191 medical schools from 67 distinct countries. The plurality of internationally trained physicians (23.1%) attended medical school in the Philippines (Table 4), frequently at the University of Santo Tomas in Manila. The physicians trained in either the Philippines, Canada, or the Caribbean composed over 47% of all international medical graduates practicing in Hawai'i.

Between 2009 and 2011, a total of 238 physicians from the AHEC database retired from medicine or transitioned to non-clinical activities and 329 physicians left Hawai'i to practice in other locations (Table 5). Among the physicians who left to practice elsewhere, 10.0% were osteopathic physicians and 14.0% were international medical graduates. Physicians defected to a total of 43 other states/US territories and 4 foreign countries (Map 2). California received the largest portion of

Table 2. States and US institutions where the most physicians actively practicing in Hawai'i attended medical school.				
Rank*	State	Number of physicians practicing in Hawai'i who attended medical school in each state	Percent of US-trained physicians practicing in Hawai'i (Total: 2,707)	Percent of all physicians practicing in Hawai'i (Total: 3,187)
1	Hawai'i	857	31.7	26.9
2	California	300	11.1	9.4
3	New York	164	6.1	5.1
4	Illinois	126	4.7	4.0
5	Pennsylvania	110	4.1	3.5

*Rank among the 47 US states and territories with medical schools represented in this study.

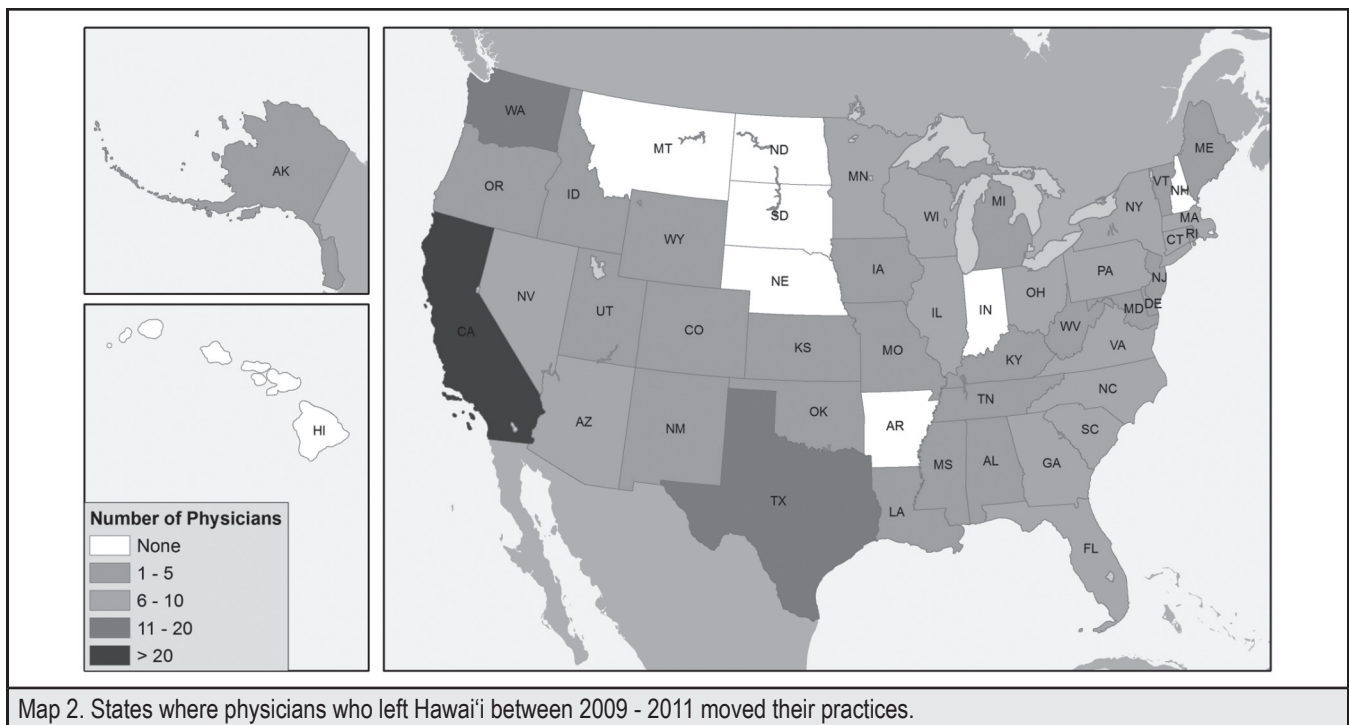
Table 3. US medical schools where the most physicians actively practicing in Hawai'i trained.				
Rank*	Medical School (State/US territory)	Number of physicians practicing in Hawai'i who attended medical school in each state	Percent of US-trained physicians practicing in Hawai'i (Total: 2,707)	Percent of all physicians practicing in Hawai'i (Total: 3,187)
1	John A. Burns School of Medicine, University of Hawai'i (Hawai'i)	857	31.7	26.9
2	Creighton (Nebraska)	61	2.3	1.9
3	University of California Los Angeles (California)	56	2.1	1.8
4	University of California San Francisco (California)	54	2.0	1.7
5	Georgetown (District of Columbia)	43	1.6	1.3

* Rank among the 136 US medical schools represented in this study.

Table 4. Foreign countries/regions with where the most physicians actively practicing in Hawai'i received their undergraduate medical education.					
Rank*	Country	Number of physicians practicing in Hawai'i who attended medical school in each country	Percent of internationally-trained physicians practicing in Hawai'i (Total: 480)	Percent of all physicians practicing in Hawai'i (Total: 3,187)	Number of medical schools represented in each country
1	Philippines	111	23.1	3.5	11
2	Caribbean	67	14.0	2.1	12
3	Canada	51	10.6	1.6	12
4	India	29	6.0	0.9	17
5	Taiwan	21	4.4	0.7	6

* Rank among the 58 countries/regions represented in this study.

Table 5. Physicians who stopped practicing in Hawai'i between 2009-2011.		
	Physicians	Percent
No longer practicing in Hawai'i	624	-
Practicing outside of Hawai'i	329	52.7
Practicing elsewhere in the United States	298	47.8
Practicing elsewhere in the United States but exact location unknown	25	4.0
Practicing outside of the United States	6	0.1
Retired/non-clinical work	238	38.1
Deceased	14	2.2
Unknown status	43	6.9



Rank*	State/US territory	Number of physicians who moved their practice from Hawai'i to each state/territory	Percent of physicians who moved their practices out of Hawai'i (Total: 329)
1	California	87	26.4
2	Texas	17	5.2
3	Washington, DC	14	4.3
4	New York	9	2.7
5	Nevada	8	2.4

* Rank among the 43 states/US territories to which Hawai'i physicians moved their practices.

Hawai'i's former physicians (26.4%) (Table 6). Only one other state (Texas) received more than 5% of the physicians who left Hawai'i. Only 15.5% of physicians returned to the state where they attended medical school and graduates from California represented 45% of this subset. Among the physicians who left Hawai'i and whose year of medical school graduation was known (317), 22.4% graduated in the 2000s, 30.6% graduated in the 1990s, 24.3% graduated in the 1980s, 16.7% graduated in the 1970s, and the remaining 6.0% graduated prior to 1970.

Conclusions

Although several other states also face physician shortages,¹⁴ the problem is particularly pronounced in Hawai'i, with its challenges of geographic isolation, cultural complexities, high living costs, and low reimbursement for medical services.^{1,3,4,6,15} These factors already contribute to significant disparities in health care access and health outcomes throughout the state.¹⁶⁻¹⁸ As the scarcity of physicians worsens, the areas with the most limited access to health care will be disproportionately affected.¹⁹

In an effort to mitigate the physician shortage and better inform physician recruitment and retention techniques, this study was undertaken. The data revealed that Hawai'i's physician workforce draws broadly from medical schools across the US and represent nearly 90% of the nation's 134 accredited allopathic medical schools.²⁰ While this supports the notion that medicine in Hawai'i attracts physicians from diverse backgrounds, it also makes targeted physician recruitment more challenging. The medical schools with some of the most alumni practicing in Hawai'i (ie, Creighton, University of California Los Angeles, University of California San Francisco, and Georgetown) all have active or recently-active Hawai'i student clubs.²¹⁻²⁴ This may indicate larger populations of students from Hawai'i and/or a greater interest in the state. Therefore, this research recommends targeting schools with Hawai'i clubs for recruitment efforts. Additionally, Hawai'i's composition of osteopathic physicians (2.9%) is lower than the national averages (7% and growing),²⁵ suggesting that this physician workforce may not be maximally recruited or employed in the state. Perhaps recruitment efforts

should also target osteopathic schools that have contributed the most graduates to Hawai'i's physician workforce.

Few trends are apparent when considering the physicians who left Hawai'i to practice elsewhere. Other than California, which gained over a quarter of the physicians departing Hawai'i, no region or alma mater demonstrates notable associations with physician emigration. This is not surprising when considering that many "push" and "pull factors" affect physician migration, both within and between countries.^{26,27} The concerning finding is that physicians of all ages are leaving Hawai'i to practice elsewhere; over half of those who left graduated from medical school in the past 20 years. This finding underscores the importance of identifying the measures that will optimize physician retention. Future study recommendations, therefore, include conducting exit surveys of physicians leaving Hawai'i to identify primary reasons for leaving.

There are a number of limitations to this study. Chief among them is that physicians' residency locations, which were unavailable for 41% of the physicians, were not included in this study and may have confounded findings. Future studies would benefit from evaluating physician migration patterns with respect to both medical school and residency locations for the studied physicians. It was neither possible nor practical to directly contact all physicians in the AHEC database. Furthermore, utilizing the 2008 AMA Masterfile vis-à-vis 2009-2010 medical licensure data may not have captured the most recently licensed physicians. As such, this study acknowledges potential error in the counts and percentages of practicing physicians in Hawai'i.

Conflict of Interest

None of the authors report any conflict of interest.

Disclosure Statement

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