



Evaluation of the Need for an Advanced Ultrasound Education Program for Trauma Practitioners in Hawai'i

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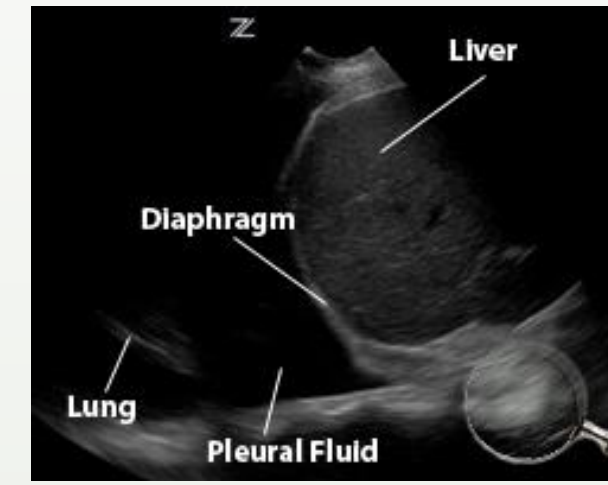
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BACKGROUND

Why ultrasound?

- Portable, rapid, noninvasive, and can be adapted to the patient's condition—essential for trauma.
- Reduce the number of CT scans—lowers costs and reduces radiation.
- Focused Assessment with Sonography in Trauma (FAST) Exam: identify free fluid (blood) in the peritoneal, pericardial, or pleural spaces.
- Can be taught quickly



Current issues

- Lack of standardized training requirements possibly contributing to the limited use of ultrasound (u/s) in certain medical fields.
- U/s mastery requires experience and practice—users lack the confidence to perform examinations on their own.

OBJECTIVES & HYPOTHESES

Objectives

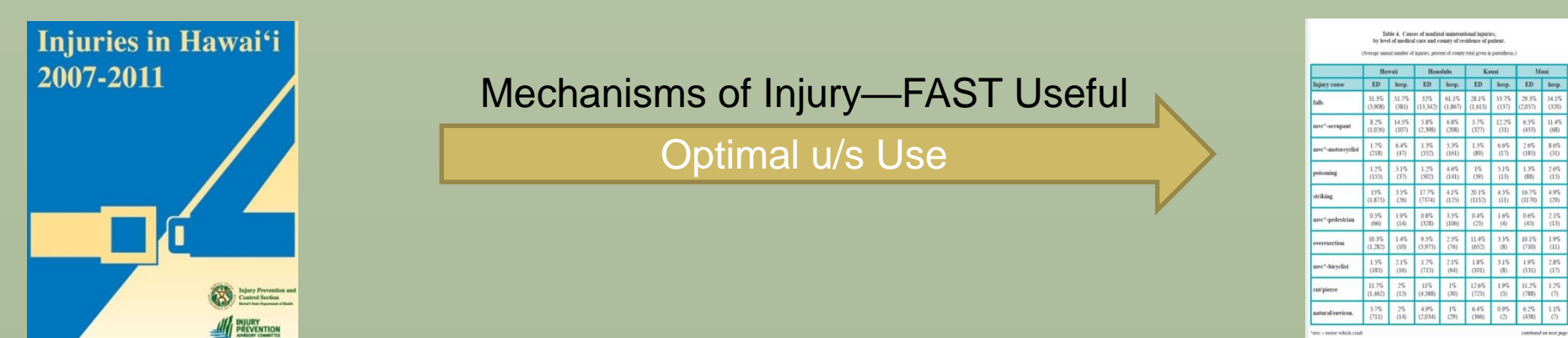
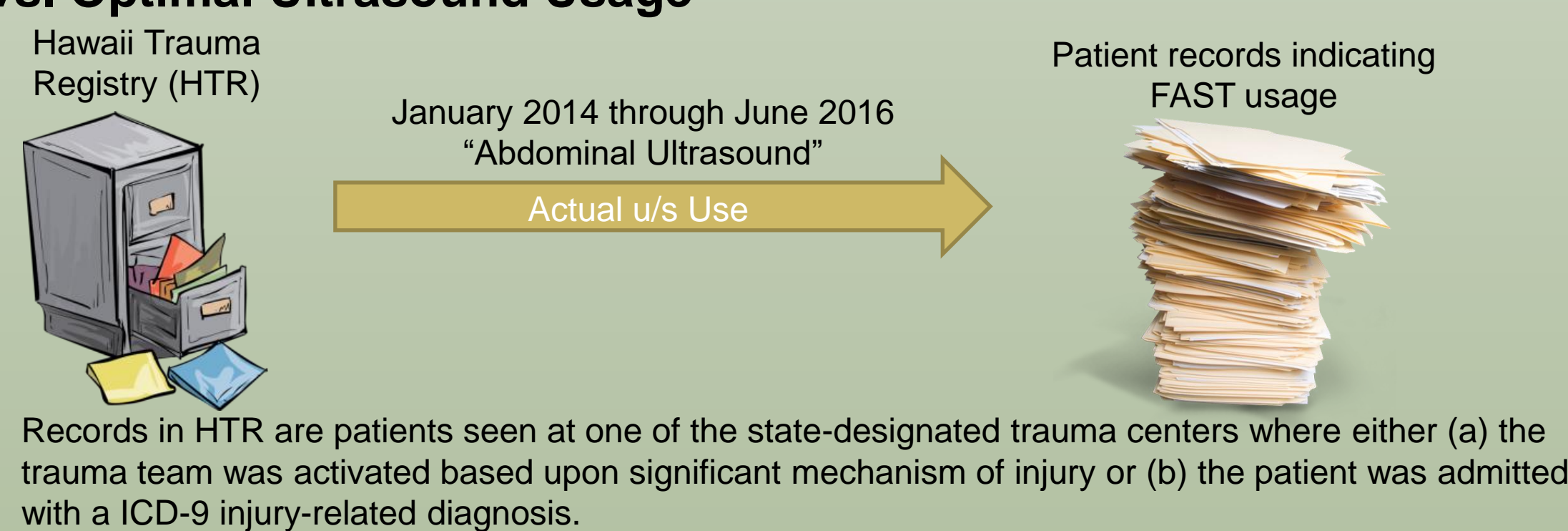
- Investigate the need of an advanced u/s education program for trauma practitioners in the state of Hawai'i.
- Distribute a needs assessment survey to interested practitioners, determine possible obstacles to u/s use to better inform the future implementation of an u/s education program.

Hypotheses

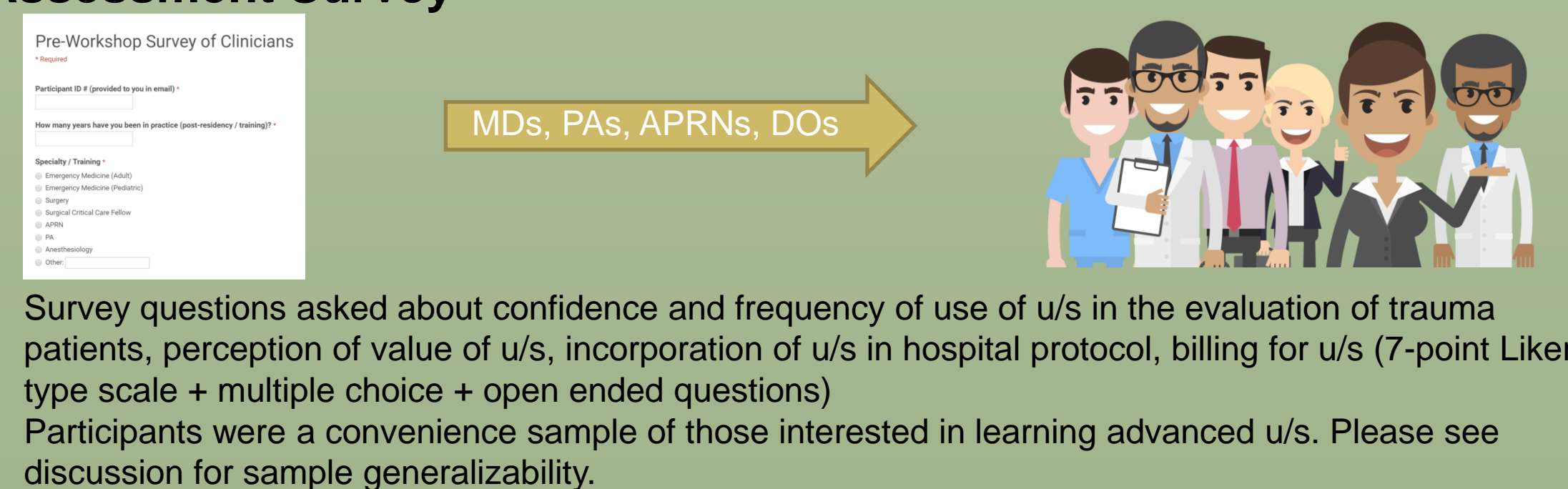
- U/s is not being used as frequently as it should be. We hypothesize that there is a gap between the current and optimal use of u/s.
- There are regional variations in the use of u/s which are not explained by variability in patient injury patterns.
- Those with formal u/s training use u/s more frequently
- Greater use of u/s could lead to faster and more accurate diagnosis of patients which is especially important in trauma patients.

MATERIALS & METHODS

Actual vs. Optimal Ultrasound Usage



Needs Assessment Survey



Economic Analysis

Used publicly available Medicare charge data under the following codes:
 76705 – abdominal ultrasound
 93308 – cardiac ultrasound
 76775 – retroperitoneal (aorta / IVC) ultrasound
 76937 – vascular ultrasound guidance
 IRB approval was obtained

RESULTS

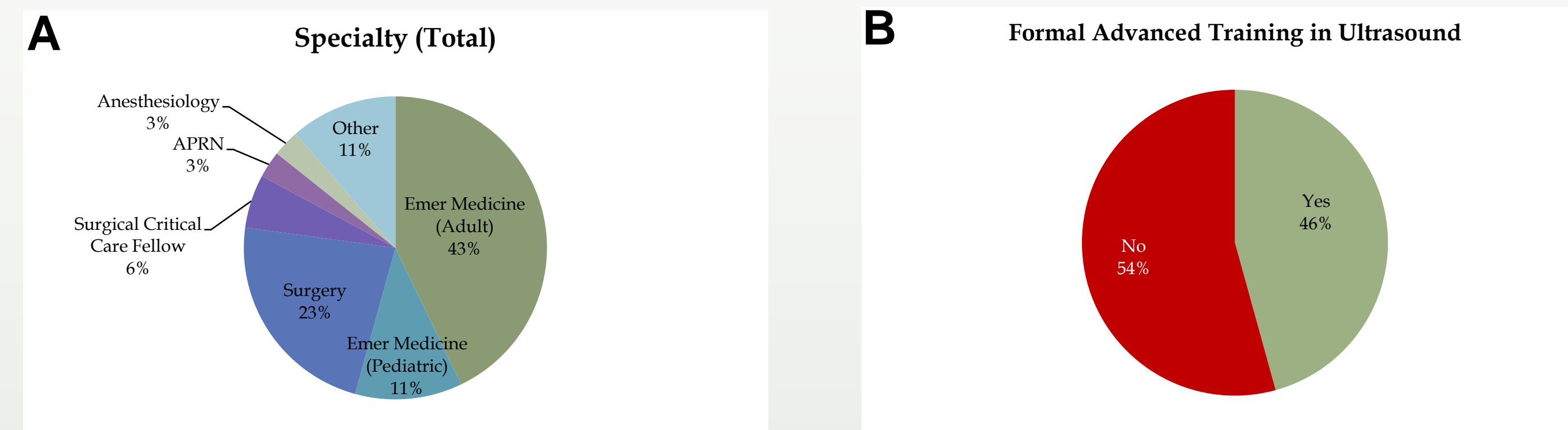


Figure 1 Survey respondents' demographics.
A) Breakdown of all respondents' specialties by percentage. Adult emergency medicine and surgery were the two most prevalent specialties of respondents who did not have formal advanced u/s training **B)** Out of 35 respondents, 54% did not have formal advanced u/s training while 46% did have prior training.

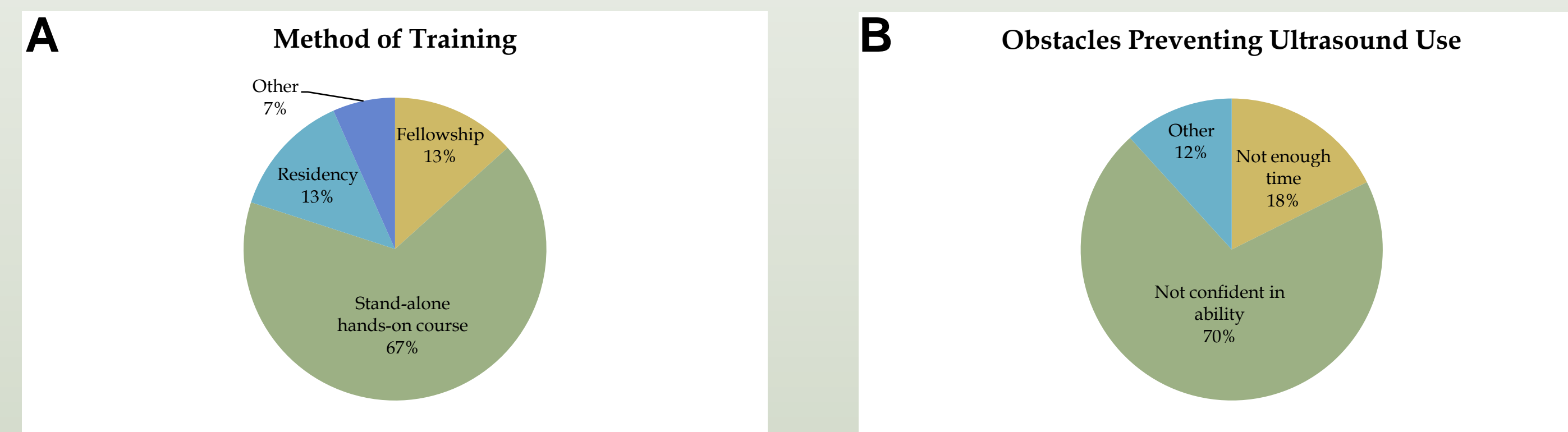


Figure 2 Survey Respondents' previous training in ultrasound.
A) Those who answered "yes" to having prior training were asked what method of training they received. The majority of respondents received training from a stand-alone hands-on course. **B)** Reported obstacles preventing survey respondents use of u/s. "Other" responses included "hassle in having machine brought to bedside" and "no opportunity to practice performing FAST exam".

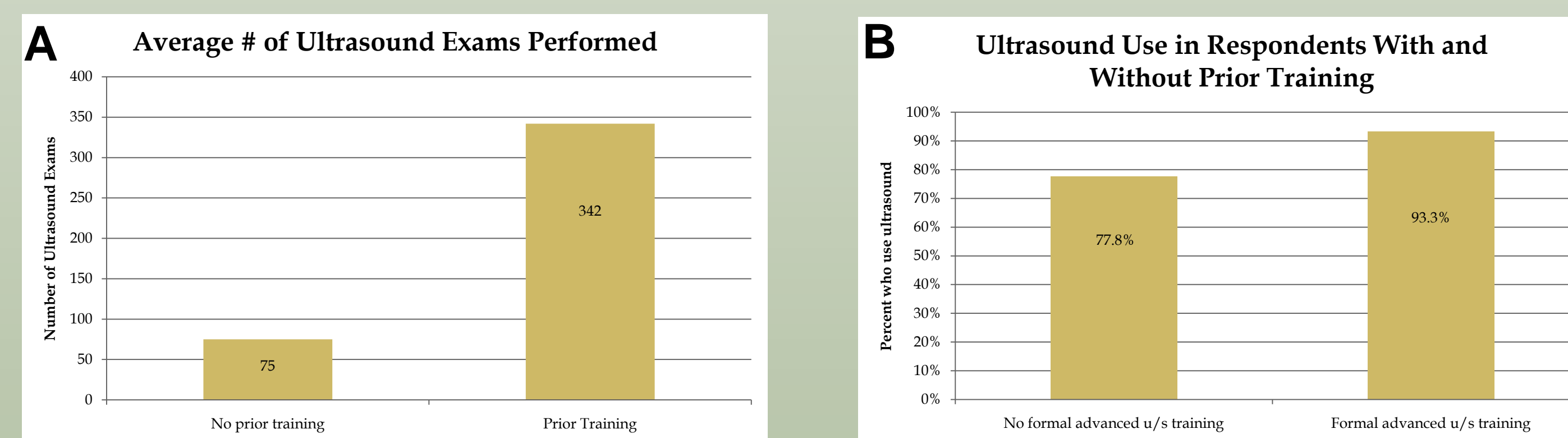


Figure 3 Survey Respondents' ultrasound usage.
A) Respondents without formal advanced u/s training performed an average of 75 lifetime u/s exams while respondents with formal advanced u/s training performed an average of 342 lifetime u/s exams. **B)** 77% of those with no formal u/s training still used ultrasound for the evaluation of trauma patients. On the other hand, 93% of those with formal ultrasound training used reported using ultrasound for the evaluation of trauma patients.

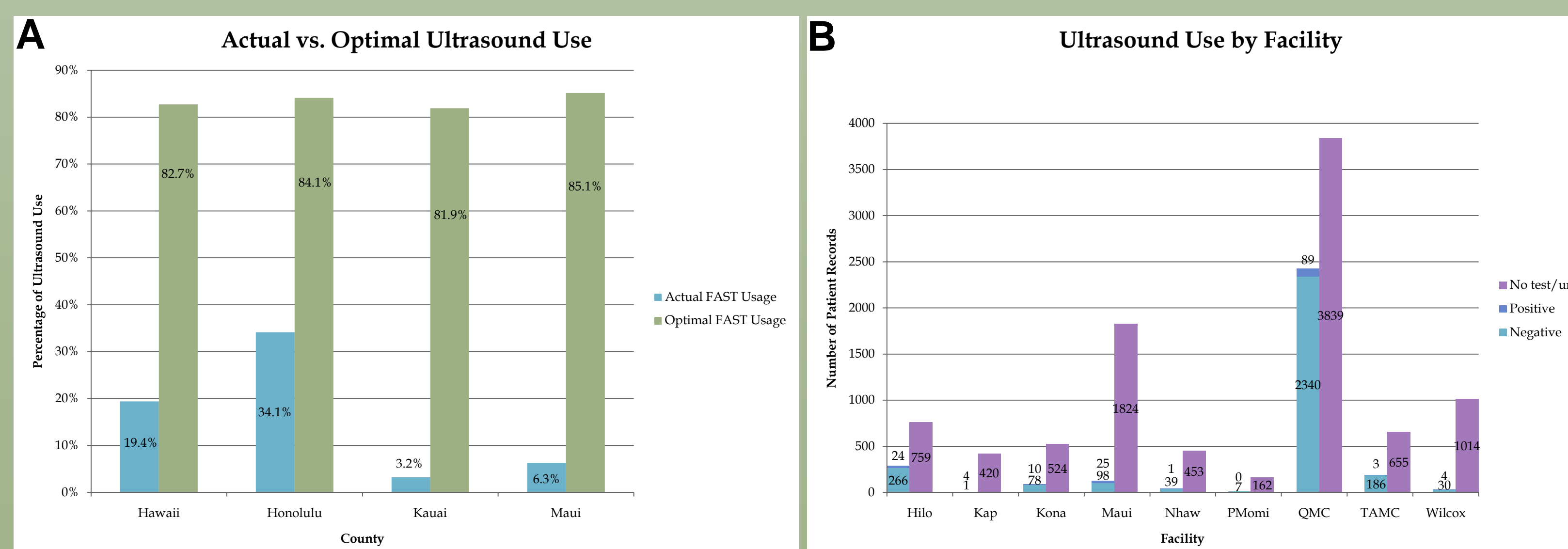


Figure 3 Data from Hawaii Trauma Registry (HTR) from January 2014 to June 2016. 12,855 patients records indicated FAST usage **A)** Percentage of current u/s usage by county was compared to estimated optimal u/s usage obtained from "Injuries in Hawaii" Report (2007-2011). "Optimal" u/s usage indicates patients with mechanism of injury that would benefit from the use of u/s. **B)** U/s use by facility. The data show the number of cases where an u/s scan was performed (subdivided by the results of the exam—negative or positive) and the number of cases where an u/s scan was not performed.

RESULTS (CONT'D)

\$7,809,828.28 per year

Conservative estimate of yearly additional revenue to physicians and hospital if u/s were used in all cases where it was indicated, documented, and appropriately coded and billed for (assuming the patient has health insurance).

DISCUSSION

Analysis of Data from Hawaii Trauma Registry

- No significant change in u/s use between January 2014 and June 2016 despite more knowledge about u/s; previous studies showed that u/s can decrease patient diagnosis time and increase accuracy of diagnosis.
- Figure 3B. Queen's Medical Center has a significantly greater use of u/s than any other facility (Note: QMC is the state's only Level II trauma center).

Analysis of Data from Needs Assessment Survey

- Figure 1C. Most common answer to "Obstacles to using u/s?"—lack of confidence in their ability to perform the exam. U/s use requires mastery of both image acquisition and image interpretation (interpretation more difficult).
 - Confidence in image interpretation is gained through practice which can be difficult to obtain, depending on specialty.

- Figure 3A. Respondents with formal u/s training were more likely to have performed >100 lifetime u/s exams ($p=0.0383$). *This supports our hypothesis: those with formal u/s training use u/s more frequently.*

- Figure 3B. Respondents with formal u/s training are more likely to perform an u/s exam ($p=0.3457$) *This supports our hypothesis: an u/s education program could increase the use of u/s in trauma patients.*

- The self-reported frequency of u/s use (58%) was higher than the frequency of u/s use recorded in the HTR (16%). However, survey participants make up a convenience sample and the majority of respondents were from Honolulu county—when compared to the HTR's u/s use in Honolulu alone (34%) the survey respondents are a good representation of the population of interest. This finding strengthens our needs assessment.

LIMITATIONS

HTR Data

- Records in the database may be inaccurate if facilities do not report, document, or bill for every use of u/s. Practitioners may be using u/s more than what the data implies.

Data on Optimal Use of FAST

- Some methods of injury in the "Injuries in Hawaii" report were excluded if they had a low probability of cases requiring a FAST examination (ex. injuries caused by poisoning). Thus, the "optimal" use of u/s is not exact, but is a good conservative estimate.

- An exact number of cases for use of FAST cannot be determined without looking at individual patient records which was not feasible within the time frame of this study.

Survey data

- Self-reported data
- Only represented individuals interested in learning more about u/s. A challenge that needs to be addressed in the future is how to reach those who do not see the importance of u/s.