



Do the research priorities identified in SAGES Delphi studies resonate with rural general surgeons: a Washington state perspective

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Abstract

Background Rural surgeons operate in an environment significantly different from that of their colleagues, and as such they face unique challenges. We hypothesized the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) research agenda (as identified in the results of the 2014 Delphi study) will differ in its priorities from those identified by rural surgeons. We aimed to pilot a study in Washington state that could be replicated in other areas of the USA and the world.

Methods We identified general surgeons working at rural critical access hospitals in the state of Washington. We then conducted virtual, semi-structured interviews and followed up with surveys and site visits. The survey included the 2014 SAGES Delphi-ranked research priorities. We asked rural surgeons to rank their top 5 of these 40 priorities and to detail any additional which were not on the list.

Results We contacted 79 surgeons with a 30% response rate. We conducted 25 semi-structured interviews and received 18 completed follow-up surveys. These interviews were followed by site visits at 4 of the 23 sites. Of the original Delphi research priorities, those most cited by rural surgeons were #8 (“What is the best method for incorporating new techniques and technology for surgeons of variable levels of experience or training?”) and #1 (“How do we best train, assess, and maintain proficiency of surgeons and surgical trainees in flexible endoscopy, laparoscopy, and open surgery?”). Four surgeons included the last SAGES priority (#40 “Is quality of life improved after ventral hernia repair?”) among their top 5.

Conclusion This study suggests that although rural surgeons’ research priorities align with the published SAGES Delphi survey, these surgeons rank the priorities differently. This may be because the predominant study population of the Delphi is SAGES membership who work in urban and academic centers. Plans for future SAGES Delphi survey could capture these unique priorities by intentional involvement of rural and community surgeons.

Keyword Rural surgery · Research agenda · Priority setting · General surgery · SAGES · Washington state

Rural surgeons function in a significantly different environment than their urban and academic colleagues. They frequently work with independence and separation from their peers, without colleagues with whom they can consult or peers with whom they can share call as fewer rural general surgeons tend to manage a given unit population relative to their urban counterparts [1]. They do so with varying degrees of access to specific resources such as standard laparoscopic equipment and technology or customized instrument sets. They face additional limitations of surgical staff

training and retention. Some of the challenges they experience may be unique, and may not be elucidated unless intentionally identified. Understanding their challenges provides insight into their priorities and how we can best support this important group of surgeons going forward. We hypothesized that the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) research agenda as identified in the results of the 2014 Delphi survey will differ in its priorities from those identified by rural surgeons. We aimed to pilot a study in Washington state that could be replicated in other areas of the USA and the world. This study focuses on the rural general surgeons of Washington state.

Previously, research has been conducted regarding the rural surgical work force. A 2019 analysis of the general surgery workforce in rural and urban America showed that the per capita supply of general surgeons overall declined from

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6.4 per 100,000 population to 5.2 per 100,000 from 2001 to 2019: a decrease of 18.0%. Further, rural areas experienced a decrease of 29.1% in general surgeon supply during the same period, with more isolated areas experiencing a decline of 32.6% [1]. With respect to Washington where we conducted our study, as of 2019, the state is ranked 40th out of 50 in the USA for active general surgeons per capita. When we began our project in early 2020, of the 440+ registered physicians in the American College of Surgeons (ACS) for Washington, only 10% listed their residence in rural counties [2]. Most general surgeons in Washington state are located on the western side of the state and concentrated around the Seattle metro area. These statistics paint an alarming picture of the state of rural general surgery and provide further justification for why concentrating on how to understand and support this unique subgroup is so important. However, a thorough review of the literature showed that no specific analysis regarding the research priorities of this specific subgroup has been performed to date.

With no pre-existing data identifying priorities of rural general surgeons, we turned to SAGES because it has made a dedicated effort to identify surgical priorities to better target its resources for research funding and inquiry. Beginning our research in January 2020, we used the 2014 SAGES research priorities [3] as a starting point for understanding of general surgery research priorities (Appendix 1). However, surmising that many of SAGES members practice in urban and academic centers where research priorities are often set, we aimed to hear the perspectives of rural surgeons to see if they differed from that of the 2014 SAGES Delphi studies. We applaud the efforts taken to update this priority list in 2020, published in January of 2022 [4].

Materials and methods

We conducted a mixed-methods study including semi-structured interviews and surveys. Prior to interactions with rural general surgeons, we submitted our proposed project to Washington State University's Institutional Review Board. It was determined that the study satisfied the criteria for Exempt Research (i.e., no risk or minimal risk to subjects) and was exempt from most requirements needed when conducting human subjects research.

Eligibility

We began by identifying general surgeons working at critical access hospitals (CAHs) in the state of Washington. CAHs were identified by the Washington State Department of Health as meeting the criteria outlined by federal designation under the Rural Hospital Flexibility Program. CAHs are defined as federally designated hospitals in rural counties that provide

healthcare for large catchment areas. They have 25 beds or less, and receive payment based off reasonable costs for Medicare and Medicaid, instead of fee-for-service [5]. We focused on the 39 critical access hospitals in Washington (Fig. 1).

Recruitment

Beginning in 2020, surgeons were identified in four catchment areas as established for clinicals by our medical school (Fig. 2). We contacted surgeons through online directories and hospital direct inquiries. We then proceeded with outreach: we identified contact information, sent letters, and utilized introductory emails from our school to hospital Chief Medical Officers (CMOs) and rural networks around Washington state. CMOs, Chief Executive Officers (CEOs), and college faculty provided additional introductions. In most cases, at least two methods of outreach and follow-up were required to result in one successful connection.

Development of semi-structured interviews

We verbally obtained consent to use de-identified results from each of our participants. We then conducted 30 min, virtual, semi-structured interviews. The interview questions asked came from a standardized list we constructed prior to the interviews (Appendix 2). Through these open-ended questions, we sought to understand their perspectives on the challenges and advantages of practicing in rural communities. Survey development & analysis: We used our semi-structured interviews as a launching point to introduce an electronic survey asking about research priorities of rural general surgeons. The survey included the 2014 SAGES Delphi-ranked research priorities (Appendix 1), in order to understand whether the research priorities that SAGES sets for Funding and Inquiry resonated with them. Of the 40 published topics by SAGES, we asked our surgeons in Washington to rank their top 5 priorities and to detail up to 5 additional priorities that were not included if they felt topics were unrepresented. We distributed the survey via email with one question ranking their top 5 SAGES priorities and a follow-up question allowing them to free text any additional, underrepresented priorities. We then used simple quantitative statistics to analyze the survey responses.

Site visits

Finally, we pursued site visits with the surgeons to get hands-on, ground-level perspectives on their lives, their communities, their facilities, their surgical teams and their patient populations. These site visits were conducted in Aberdeen, Goldendale, Tonasket, and Brewster, Washington.

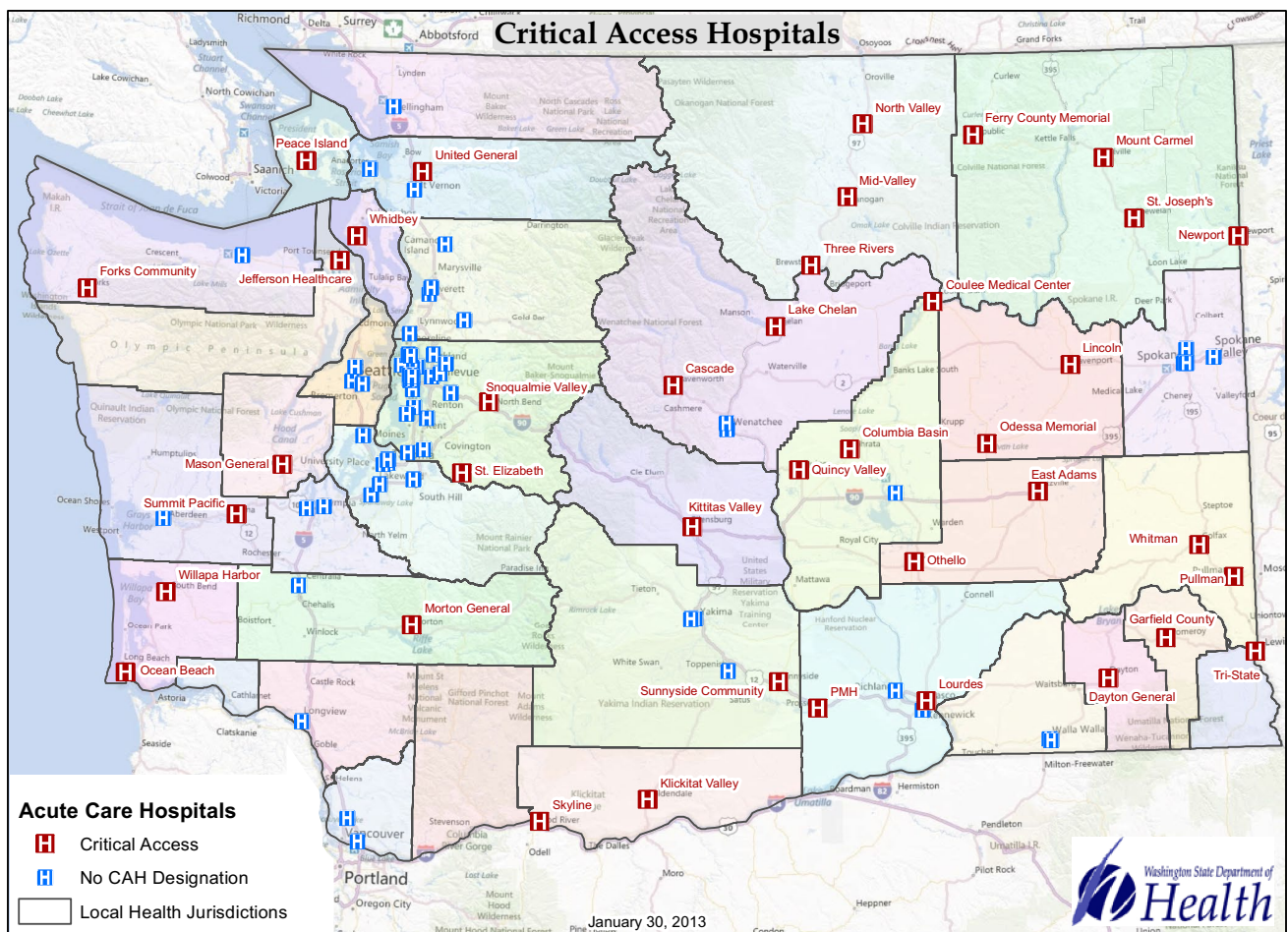


Fig. 1 Distribution of Rural Critical Access Hospitals (in red) in Washington State [6]

Results

We contacted 79 surgeons with a 31% response rate. We conducted 25 semi-structured interviews and received 18 completed follow-up surveys. These interviews were followed by site visits at 4 of the 23 sites, which provided additional insight (Table 1) (Table 2).

During our interviews, several main themes appeared. These included major limitations experienced by general surgeons: encountering operating rooms and equipment which were very different than where they had completed their training, new surgical staff with limited formal training, very few colleagues to consult, significant supply shortfalls, and in many cases a population that may not even know that they are there in the hospital.

With respect to the electronic-survey, many of these themes were reflected in the priorities our surgeons chose. Of the 40 published topics, highest ranking went to topic #8 (“What is the best method for incorporating new techniques and technology for surgeons of variable levels of experience

or training?”) and topic #1 (“How do we best train, assess, and maintain proficiency of surgeons and surgical trainees in flexible endoscopy, laparoscopy, and open surgery?”). Four surgeons included priority #40 (“Is quality of life improved after ventral hernia repair?”) among their top 5. Of note, the priority which resonated with rural surgeons the most was #8, and only one of the surgeons interviewed agreed that the top 5 priorities of the SAGES Delphi were fully representative of the top 5 rural research needs (Table 3).

Additionally, during interviews and site visits, rural general surgeons identified blood banking shortages, limitations to surgical staff training in rural operating rooms, and insufficient skill training at the residency level to transition to rural general surgery practice as an attending (Table 4).

Discussion

Through the semi-structured interviews, we were able to better understand the make-up and culture of general surgeons practicing in Washington CAHs and the challenges they

Fig. 2 Campus catchment areas were used to identify and contact rural general surgeons. Contacts were made in cities which are in white overlaid text

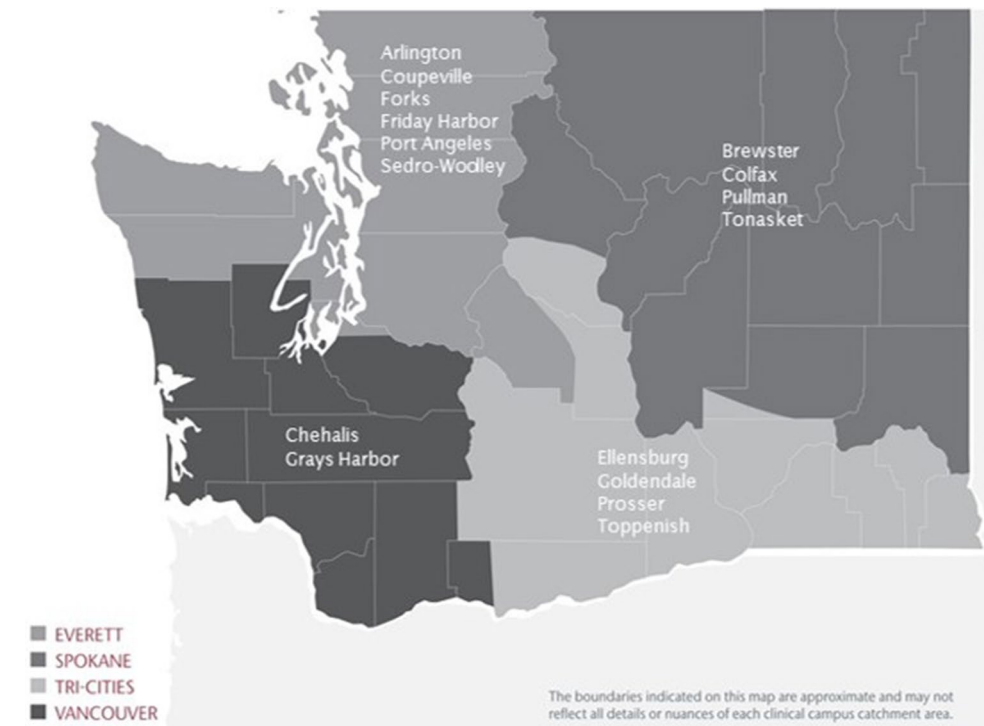


Table 1 Attempted surgeon contacts and response rates broken down by catchment areas

| Location | Number of physicians contacted | Completed interviews | Completed surveys | Site visits | Successful contact (%) |
|--------------|--------------------------------|----------------------|-------------------|-------------|------------------------|
| Everett | 36 | 8 | 4 | 0 | 22.2 |
| Spokane | 13 | 4 | 3 | 2 | 33.3 |
| Tri-Cities | 13 | 8 | 6 | 1 | 61.5 |
| Vancouver | 18 | 5 | 5 | 1 | 27.7 |
| Total | 79 | 25 | 18 | 4 | 31.6 |

Table 2 Demographic characteristics of interviewed rural general surgeons

| Rural surgeon demographics | Number of rural surgeons | Percentage of rural surgeons (%) |
|---|--------------------------|----------------------------------|
| Male to female ratio | 19:4* | – |
| International graduates | 4 | 16.6 |
| West coast residency | 9 | 37.5 |
| West coast medical school | 3 | 12.5 |
| SAGES Membership (at time of interview) | 5 | 21.7 |

*One male surgeon was interviewed twice

face on a daily basis. Furthermore, the surgeons expressed their concerns related to adapting to different equipment in the operating rooms in comparison to where they had completed their training, training surgical staff with limited formal training in a rural operating room setting, paucity of

colleagues to consult regarding challenging patient cases, and supply shortages. A common theme that recurred was the lack of familiarity with various equipment in rural surgical practice in comparison to exposure during residency at large academic institutions with the latest equipment and technology. This sentiment was discussed more frequently with younger attendings who recently graduated residency and were starting practice in rural settings or were going into rural practice short-term for loan repayment forgiveness programs/satisfying visa work requirements, though most of the rural general surgeons we interviewed in Washington pursued rural general surgery practice after having an established career in large urban communities or academic hospitals to either have a slower practice or want to improve rural surgical care. Oftentimes, the interviewed rural surgeons expressed the need to train surgical scrub technologists and registered nurses in the operating room on the newer equipment and technology used in the field. This is a challenge that is well known for rural practice as the use of advanced

Table 3 Survey results reporting the top 5 Delphi priorities of rural general surgery

| Catchment region | 1st Priority | 2nd Priority | 3rd Priority | 4th Priority | 5th Priority |
|------------------|--------------|--------------|--------------|--------------|--------------|
| Northwest | 6 | 12 | 21 | 37 | 40 |
| | 8 | 18 | 23 | 30 | 34 |
| | 8 | 14 | 15 | 21 | 27 |
| | 3 | 8 | 12 | 18 | 20 |
| | 6 | 14 | 21 | 36 | n/a |
| | 3 | 12 | 15 | 27 | 40 |
| Northeast | 1 | 4 | 17 | 11 | 39 |
| | 1 | 4 | 8 | 30 | 40 |
| | 8 | 12 | 1 | 11 | 40 |
| Southwest | 4 | 8 | 12 | 15 | 23 |
| | 1 | 18 | 8 | 15 | 20 |
| | 1 | 4 | 8 | 21 | 40 |
| | 1 | 18 | 12 | 15 | 21 |
| | 8 | 1 | 11 | 12 | 18 |
| Southeast | 8 | 11 | 12 | 14 | 15 |
| | 3 | 4 | 15 | 20 | 21 |
| | 2 | 8 | 10 | 13 | 15 |
| | 1 | 2 | 3 | 4 | 5 |

The top eight research questions of SAGES 2014 Delphi survey were #1 (“How do we best train, assess, and maintain proficiency of surgeons and surgical trainees in flexible endoscopy, laparoscopy, and open surgery?”) and #8 (“What is the best method for incorporating new techniques and technology for surgeons of variable levels of experience or training?”), which were prioritized most frequently throughout the numerical results of the surveys conducted. #8 was ranked most often (10 times), with #15* and #1 ranked 8 times and #12* ranked 7 times. Notably, the lowest ranked DELPHI priority #40*, was still ranked for 4/18 of the rural surgeons as one of their top 5 priorities

*See Delphi Questions Appendix for specific descriptions of priorities

Table 4 Additional topics of research goals not specifically expressed in DELPHI but noted during interviews

| Location | Blood banking | Staff training | Resident skills training |
|-----------|---------------|----------------|--------------------------|
| Northwest | 0 | 2 | 2 |
| Northeast | 1 | 1 | 0 |
| Southwest | 3 | 0 | 2 |
| Southeast | 0 | 2 | 1 |
| Total | 4 | 5 | 5 |

“Blood Banking” included research goals for any blood supply limitations during surgical procedure (both minimally invasive and non-minimally invasive) in rural areas. “Staff Training” referred to interest in investigating rural operating room staff training, turnover, and knowledge level, specifically for minimally invasive procedures. “Resident Skills Training” included concerns and research goals related to residency preparedness for rural regions and the preparedness of newly trained surgeons for resource-limited environments

technology in surgery has become more prevalent over the past couple of decades [7]. Although there are currently general surgery residency programs across the nation that have a specialized focus on rural training, all the surgeons

we interviewed attended traditional academic or community programs in the USA or Canada and did not have a specific sub-focus training on rural practice. These findings indicate that there could be value in transition-to-residency programs focused on rural surgery to equip surgeons-in-training with the expertise needed to be successful in various, resource-limited settings. There could also be a benefit for large national organizations such as SAGES to provide training and support for established general surgeons who are transitioning from an urban setting to a more rural practice.

There were several limitations to our project. By starting this project in January 2020, we faced several significant limitations. The advent of the COVID-19 pandemic had a devastating impact on rural healthcare facilities, limiting the availability and responsiveness of our target population. As of this writing, we were only able to connect with surgeons covering 25 of the 39 CAHs in the state of Washington. Further, as the pandemic resulted in significant travel restrictions, our strategies for augmenting our outreach and marketing efforts to surgeons at hospitals who were less responsive initially were unable to be implemented. Often, to connect for an interview, we had to be persistent in sending emails or first creating relationships with leadership at the local hospital before being placed in contact with the surgeons. During

virtual interviews, we often had service and internet connection issues resulting in frequent call drops, which could have influenced the data we collected. Additionally, as we made meaningful connections with the rural surgeons we interviewed, travel restrictions continued to impose scheduling limitations on conducting more site surveys, which we aim to pursue in the future as we continue our project. The scarcity of general surgeons practicing in rural parts of our state and our adherence to only specifically interview general surgeons and not subspecialists significantly limited our population. Finally, as mentioned during our methods and highlighted by rural surgical workforce data, the high attrition and turnover rate resulted in at least two surgeons with whom initial contact was made being lost prior to completing the interview due to job relocation.

In summary, our semi-structured interviews identified and highlighted the reported challenges in the operating room experienced by rural general surgeons across Washington State CAHs: differences in equipment and surgical support staff training, limited networks in place for consultations, and shortage limitations. Regarding the electronic survey, these surgeons prioritized aspects of additional training, equipment, and technology within the SAGES Delphi 2014 survey. Despite the barriers that many rural surgeons have, it is vital to recognize these challenges and create systems starting at the state and national level that address these barriers to provide quality patient care to underserved populations living in these areas.

We believe our findings thus far demonstrate that promising opportunities exist to close the gap between rural surgeons and their colleagues in research, training, and professional development to support rural general surgeons. As we continue to investigate, our future goals are to form a consortium of rural surgeons in Washington State and create mentorship opportunities for aspiring surgeons. Through creating a consortium, we aim to connect rural general surgeons locally, which can form a collaborative effort when faced with challenging situations as those articulated by the surgeons we interviewed. By creating opportunities for aspiring surgeons starting at the medical school level, we hope to prepare future generations of physicians to make solutions across the country to improve access to quality surgical healthcare.

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Declarations

Disclosures Sarah Lewis, Athena Hoppe, Katelyn Larson, Veronika Lobova, and Dr. Anjali Kumar have no conflicts of interest or financial ties to disclose.

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