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Survey article

Geographic disparities in the distribution of the U.S. gynecologic oncology workforce: A Society of Gynecologic Oncology study

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ABSTRACT

A recent ASCO workforce study projects a significant shortage of oncologists in the U.S. by 2020, especially in rural/underserved (R/US) areas. The current study aim was to determine the patterns of distribution of U.S. gynecologic oncologists (GO) and to identify provider-based attitudes and barriers that may prevent GOs from practicing in R/US regions. U.S. GOs (n = 743) were electronically solicited to participate in an on-line survey regarding geographic distribution and participation in outreach care. A total of 320 GOs (43%) responded; median age range was 35–45 years and 57% were male. Most practiced in an urban setting (72%) at a university hospital (43%). Only 13% of GOs practiced in an area with a population < 50,000. A desire to remain in academics and exposure to senior-level mentorship were the factors most influencing initial practice location. Approximately 50% believed geographic disparities exist in GO workforce distribution that pose access barriers to care; however, 39% "strongly agreed" that cancer patients who live in R/US regions should travel to urban cancer centers to receive care within a center of excellence model. GOs who practice within 50 miles of only 0–5 other GOs were more likely to provide R/US care compared to those practicing within 50 miles of ≥ 10 GOs ($p < 0.0001$). Most (39%) believed the major barriers to providing cancer care in R/US areas were volume and systems-based. Most also believed the best solution was a hybrid approach, with coordination of local and centralized cancer care services. Among GOs, a self-reported rural-urban disparity exists in the density of gynecologic oncologists. These study findings may help address barriers to providing cancer care in R/US practice environments.

1. Introduction

Multiple studies document a survival advantage for women with gynecologic malignancies when treated by a gynecologic oncologist (Earle et al., 2006; Chan et al., 2007, 2011). However, gynecologic cancer patients require highly specialized care throughout the spectrum of their lives, and this is not always available at suburban community hospitals or rural medical centers. Prior reports suggest that distance from residence to a gynecologic cancer treatment facility is a significant barrier to care and may have a substantial impact on cancer outcomes (Birkmeyer et al., 2004).

Although progress has occurred in the treatment and survival of women with gynecologic malignancies, significant health care disparities remain that prevent equal access to care. An unequal cancer burden is borne by blacks, by individuals of lower socioeconomic status, by the elderly and by those who are geographically remote from a high volume cancer center with specialists (Mullee et al., 2004; Karjalainen, 1990; Erikson et al., 2007; Braun and Clarke, 2006).

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Reports on survival disparities in other cancers, such as breast and colorectal cancer, are attributed to differences in regionally-based socioeconomic factors and to differences in access to and receipt of quality treatment and post treatment follow-up (Karjalainen, 1990).

Geographic disparities in cancer survival are observed in several studies (Karjalainen, 1990; Erikson et al., 2007; Gunderson et al., 2013; Ward et al., 2004). Knowing whether cancer incidence and survival vary geographically is important because health care is most often delivered locally (Erikson et al., 2007). Therefore, identification of areas with better or worse survival may reflect access to, and quality of, care. Accordingly, understanding how location of cancer specialists influences survival outcomes for those with cancer is critical. Yet, little is known with respect to census data or distance-to-provider statistics of the gynecologic oncology work force in particular. Therefore, the primary study aim was to define how the U.S. gynecologic oncology work force is distributed geographically as well as to understand provider practice patterns and attitudes with respect to outreach and providing cancer care in rural settings. A secondary aim was determining survey respondent opinions regarding potential solutions to cancer care access issues, including adoption of dispersive care models compared with centralized cancer care in urban "centers of excellence".

2. Materials and methods

The study was conducted on behalf of the Society of Gynecologic Oncology's Gynecologic Oncology (SGO) Fellows Research Network. Institutional review board approval to conduct this study was obtained through Johns Hopkins Hospital and Greater Baltimore Medical Center, Baltimore, MD. An electronic survey study was performed and U.S. gynecologic oncologists were invited to participate. After submitting an application to the SGO, a list of SGO members' email addresses was obtained. An email invitation to participate was sent out to all actively-practicing, U.S. SGO members who are gynecologic oncologists (n = 743). Those members who did not immediately complete the survey were sent two additional email invitations to participate. Participation was voluntary and was incentivized with a $15 Amazon gift card, offered to each survey respondent upon completion of the questionnaire.

The online, 40-item survey assessed provider demographics and education, practice characteristics and geographic location and opinions and practices regarding outreach. Most questions were designed in multiple-choice or Likert formats; however respondents were also given the opportunity to provide open-ended feedback on select questions. The responses of those who elected to provide written feedback were subjected to qualitative analysis as described below. Descriptive statistics were calculated with the number of responses as the denominator. Fisher's exact test and the Chi-square test were used to detect differences in responses among groups using Stata 11.1 statistical software (StataCorp, College Town, TX).

2.1. Qualitative analysis

We conducted a thematic analysis aimed at identifying a set of main themes in the views expressed (Silverman, 2000; Kumpulainen et al., 2002). Using the open-ended responses provided by survey respondents (n = 44), investigators SR and KLR read and discussed the content and identified the main themes, which formed the basis of a draft-coding framework. Both investigators then independently reviewed responses applying the draft coding framework and making modifications to it through an inductive and iterative process. The two investigators then discussed the coding framework and coding choices in detail. Differences were resolved by consensus. All coding was reviewed in light of these inter-reviewer discussions and decisions about the final framework.

Table 1
Provider-respondent demographics.

Characteristic	N	%
Age		
≤ 45	140	47.78
46–65	132	45.05
> 65	21	7.17
Gender		
Female	125	42.96
Male	166	57.04
Race		
White	235	83.93
Black	6	1.81
Hispanic	10	3.57
Asian	36	12.86
Other	5	1.79
Region		
New England	26	8.15
Mid Atlantic	64	20.06
Midwest	59	18.50
Southeast	77	24.14
Southwest	35	10.97
West	58	18.18
Practice setting		
Urban	232	73.19
Suburban	24	7.57
Rural	5	1.58
Both Urban and Suburban	28	8.83
Both Urban and Rural	21	6.62
Both Suburban and Rural	7	2.21
Practice type		
Federal government	8	2.61
University Hospital	133	43.46
Community Hospital	83	27.12
Hybrid	56	18.30
Solo private practice	3	0.98
Group private practice	37	12.09
Years in practice		
3 years or less	59	18.59
4–9 years	79	24.92
10–20 years	90	28.39
> 20 years	89	28.08

3. Results

A total of 320 (43%) gynecologic oncologists responded to the survey. Compared to those who responded, non-respondents were more likely to be older (> 65; p = 0.01) and more likely to practice in New England (p = 0.02) or the West (p = 0.05). Provider demographics are listed in Table 1. The median age range of respondents was 35–45 years (42.7%), 57.0% were male, 83.9% were Caucasian and 85.7% were married. Most respondents reported working > 20 years (28.1%) and the majority practiced in an urban setting (73.2%), and at a university hospital (40.5%). Most gynecologic oncologists reported practicing at 2–3 hospitals (48.0%) and practiced in multiple hospital systems (67.2%). Services provided by gynecologic oncologists at ancillary hospitals included surgery (93.6%), inpatient consultation (86.7%) and outpatient clinical services (58.5%). Travel distance to ancillary hospitals was estimated to be < 50 miles in most cases (86.4%), with only 13.6% of gynecologist oncologists traveling > 50 miles. Physicians in academic practices were the least likely to serve in rural areas (6.5%), while those at community hospitals were the most likely to serve rural populations (22.1%; p = 0.006). Gynecologic oncologists who practiced at more than one hospital were not more likely to work in rural areas (p = 0.19). Respondents estimated that approximately 1/3 of patients live beyond 50 miles of their practice location and that 20–30% of their patients had Medicaid or no insurance coverage.

The majority of respondents reported not performing outreach (59.0%) because it was not an option in their current practice (52.8%) or because their clinical workloads did not allow them to do so (53.2%). Additional reasons for not performing outreach cancer care are listed in

Table 2
The most common factors preventing gynecologic oncologists from providing outreach or rural cancer care.

Answer choices	% of respondents who answered affirmatively to each question	N
I do not perceive a need for outreach in my current practice location	21.8	37
I do not have the transportation means to perform outreach	2.9	5
I am not interested in performing outreach	10	17
It is not an option to perform outreach in my current position	52.8	90
Existing payer pressures (ie changes in Medicare/Medicaid rules and reimbursement rates) prevent me from considering outreach	7.7	13
The costs of running a practice prevent me from performing outreach	13.5	23
My clinical workload at my primary practice location is all-consuming	53.5	91

Table 2. > 42% practiced within 50 miles of 10 or more gynecologic oncologists. Approximately 39% of respondents agreed that women with a gynecologic cancer diagnosis who live in rural or underserved regions should be expected to travel to urban cancer centers to receive care; most (43.7%) of gynecologic oncologists believed it was reasonable for women to travel 25–50 miles for care; while 41.7% believed that 51–150 miles was reasonable.

There were a significantly greater number of gynecologic oncologists in New England and the Mid-Atlantic regions who practiced within 50 miles of 10 or more oncologists (68.2% and 66.7% respectively, $p < 0.0001$). Furthermore, almost half (49.2%) of physicians at academic institutions reported practicing within 50 miles of 10 or more oncologists ($p = 0.05$). Gynecologic oncologists who practiced within 50 miles of only 0–5 other oncologists were more likely to provide outreach to rural areas compared to those who practiced within 50 miles of 10 or more oncologists (56.2% vs 31.7%, $p < 00001$). The number of years in practice was not associated with outreach care ($p = 0.4$). When examining patterns of practice by region, the West had the greatest percentage of gynecologic oncologists providing outreach (57.4%) compared to other regions (25.9 to 43.9%; $p = 0.03$).

3.1. Qualitative data analysis

Participants were given the opportunity to comment on strategies to provide gynecologic cancer care for women living in areas remote from comprehensive cancer centers. Of the 320 respondents, 58 (18%) provided feedback, which was analyzed using thematic interpretation as described in the methods. There were three major themes identified: quality care and safety, characteristics of both rural and centralized gynecologic oncology care, and the need for coordination of centralized and local services.

Thirty nine percent believed there were barriers to provision of quality cancer care in rural or underserved areas; the majority (29.5%) expressed the major impediment was systems-based (ie, lack of ICU, other surgical services, ancillary staff). Survey respondents expressed concern regarding the ability of smaller community hospitals to provide comprehensive care for gynecologic oncology patients.

Throughout the responses, the issue of post-operative safety recurred. The concept of operating on a patient without personally overseeing the post-operative care was felt to be dangerous and irresponsible. Furthermore, ancillary services available at larger centers were deemed necessary for patients undergoing lengthy surgeries requiring multi-organ resection. Similarly, rural gynecologic oncology care was characterized as low volume with limited support services. In addition, it was felt that a model of localized care might place an unsustainable workload burden on gynecologic oncologists. Centralized gynecologic oncology care was described in terms of high volume centers with the infrastructure, expertise and ancillary support services necessary for excellent patient care. The respondents highlighted the importance of a multidisciplinary team approach to gynecologic cancer care and what they viewed as directly correlating with optimizing patient outcomes.

An overwhelming majority of respondents believed the best solution was for coordination of local and centralized services. This model would necessitate patient travel for high complexity components of care, but would allow for local access to care when the therapy interval is required to be both lengthy and more frequent.

4. Discussion

A 2007 American Society of Clinical Oncology (ASCO) Work Force study reports that the demand for visits to oncologists is expected to increase approximately 50% by 2020, while supply will rise by only 14% (Kumpulainen et al., 2002; Gunderson et al., 2013). The projected rise in demand for oncologists is largely driven by the doubling of the number of Americans older than age 65 and an 80% increase in people diagnosed with, or surviving, cancer. This translates to a shortfall of between 2550 and 4080 oncologists overall. Due to lack of specific demographic information for U.S. oncologists and their practices, it is not possible to comprehend how prevalent access issues are in specific geographic areas (Erikson et al., 2007). Additionally, there was little emphasis on how these projections may impact gynecologic cancer care.

Cancer care requires specialty surgical and medical resources that may not consistently be found in rural areas. Oncology specialists in particular are not found in abundance in rural settings, as their work often requires tertiary hospital settings, found primarily in urban and suburban regions with sizeable populations (Erikson et al., 2007; Gunderson et al., 2013; Ward et al., 2004). Of the SGO members surveyed in the current study, fewer than 13% reported working in rural areas, especially those in academic appointments or residing in the Mid-Atlantic and North East. Though many gynecologic oncologists practiced at more than one hospital, respondents reported these ancillary institutions were commonly within 50 miles of their primary institution, with few reporting delivery of outreach rural or underserved regions.

The most common concerns expressed by survey respondents regarding practicing in rural regions were: 1) low perceived clinical volumes, and 2) potential lack of access to multidisciplinary, systems-based resources. The care of a gynecologic oncology patient is recognizably complex and respondents opined that a multidisciplinary approach to their care performed by high volume providers was crucial for better survival outcomes. These are legitimate concerns, with Wright et al. recently demonstrating that low volume hospitals may not necessarily have higher surgical complication rates, but instead, may demonstrate increased mortality rates (the concept of “failure to rescue”) in those patients who do experience complications because of lack of resources or medical expertise (Wright et al., 2012). Although the majority of respondents agreed that significant distance-to-provider disparities exist for gynecologic oncology patients and that these barriers may impact the quality of care delivered, they overwhelmingly expressed a need for centralization of the more complex aspects of patient care at large, high volume “centers of excellence”, as demonstrated by many European countries who employ this model of resource

allocation (Karjalainen, 1990; Erikson et al., 2007).

It is possible, though, that many living in rural America may not have the means or the desire to travel to or receive care from a comprehensive cancer center or "center of excellence". Whatever the reasons, many rural cancer patients do not routinely receive guideline-adherent cancer care by specialists (Earle et al., 2006; Karjalainen, 1990; Erikson et al., 2007; Braun and Clarke, 2006; Silverman, 2000), and almost half of women with a gynecologic cancer in the U.S. are receiving treatment at low volume hospitals or at centers poorly equipped to provide the standard of care (Earle et al., 2006; Chan et al., 2007, 2011). Further, despite the documented survival advantage for women when treated by a gynecologic oncologist, women residing in rural or underserved regions are not likely to receive care from a gynecologic specialist. Accordingly, how can this dilemma be reconciled?

A possible solution most likely lies in a hybrid centralized-dispersive model. Surgical oncology services, which require the highest concentration of surgical/medical subspecialists, ancillary staff and unique/costly facilities, are best performed at high volume hospitals or cancer "centers of excellence". Treatment delivered over a period of time, such as routine chemotherapy and/or radiation treatments and surveillance and survivorship care may be coordinated locally, with experienced regional providers and specialists and with midlevel providers. Several survey respondents supported this hybrid model, as it minimizes frequent long-distance travel while potentially granting rural or underserved patients broader access to standard of care or novel therapies. Development of national or state-specific policies to incentivize oncology fellowship graduates to work in underserved areas, similar to the National Health Service Corps, may help alleviate this problem.

Study strengths include the relatively high rate of survey responses (43% response rate, when historically, the SGO membership population has less than a 30% survey response rate (Worley et al., 2013; Garg et al., 2011)), the geographic and practice-diversity of respondents and obtaining pilot survey data that informs our understanding of the gynecologic oncology work force distribution in the U.S. Although we could not test the validity of the open-ended responses, we observed substantial internal consistency in views and themes across responses. Limitations included the possibility of recall and selection bias among respondents.

Our gynecologic oncology workforce study demonstrates that among SGO members surveyed, a rural-urban disparity exists in the density of gynecologic oncologists. It is possible this inequality may affect patient access to cancer care services and may negatively influence outcomes for those with gynecologic cancer in rural areas. However, our analysis was not designed to answer this question. Future studies examining the impact of rurality status on clinical and survival outcomes and whether it varies with geographic location are forthcoming. It is our hope that these studies will inform providers, health care systems, and policy makers as they work to ensure access to optimal cancer care services for rural populations.

Disclosure statement

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Appendix A. Appendix: select respondent answers to open-ended questions regarding barriers to provision of gynecologic oncology care in rural areas

A.1. Quality care and safety

"A major problem for gyn[ecologic] oncology surgery is that it cannot be safely provided in all hospital settings, particularly for ovarian cancer patients."

"I think the major barrier to outreach is the services available at hospitals in remote locations. For big oncologic cases, patients need to be in places where the other multiple specialties are available (ICU, good anesthesia, nurses with expertise in sick patients, etc). In addition, the model of operating on a patient and leaving the post-op care to general Ob/Gyns or surgeons is fraught with its own issues – a complication on a "routine" case can lead to catastrophic consequences when a surgeon with experience is not the person rounding on the patient daily."

A.2. Characteristics of both rural and centralized gynecologic oncology care

"[R]ural locations cannot support more than one doc and a solo gyn onc is not an attractive proposition due to the emotional and physical burden of what we do, let alone the issue of call and vacation coverage."

"We can't be all things to all people… It makes more economic sense to have quality centers of excellence that maintain critical case experience and quality, rather than have gyn oncs travel to remote locations with poor medical support services."

"The idea that the survival of gynecologic cancer patients is improved simply because there was a Gyn Onc involved in their care is wildly egotistical and blind to the broader implications of the results. The survival was better because they left Smalltown and went to the Big City, where the radiologist who read the CT scan was better, the pulmonologist who followed them in the ICU was better, the staff was better trained, the OR was better equipped, an experienced anesthesiologist took care of them… from top to bottom, the care was better."

A.3. The need for coordination of centralized and local services

"I would respectfully submit from my experience that most invasive gynecologic oncology cases could be evaluated, triaged (if needed) and in most situations operated on in university academic hospitals or in large community teaching hospitals (those with independent ob-gyn residencies [for] example) where a real full service gynecologic oncology service can exist independently. Subsequent management should include the gynecologic oncologist as the team leader for decision making, whether primarily administering chemotherapy, collaborating with gynecologic medical oncologists, or coordinating care with trusted medical or radiation oncologists at further distances similar to high-risk OB and trauma service triage systems… If perinatology and trauma services conduct their care with distance referral routinely, why are we unable to accomplish the same?"

References

Birkmeyer, J.D., Dimick, J.B., Birkmeyer, N.J., 2004 Apr. Measuring the quality of surgical care: structure, process, or outcomes? J. Am. Coll. Surg. 198 (4), 626–632.

Braun, V., Clarke, V., 2006. Using thematic analysis in psychology. Qual. Res. Psychol. 3, 77–101.

Chan, J.K., Kapp, D.S., Shin, J.Y., Husain, A., Teng, N.N., Berek, J.S., Osann, K., Leiserowitz, G.S., Cress, R.D., O'Malley, C., 2007 Jun. Influence of the gynecologic oncologist on the survival of ovarian cancer patients. Obstet. Gynecol. 109 (6), 1342–1350.

Chan, J.K., Sherman, A.E., Kapp, D.S., Zhang, R., Osann, K.E., Maxwell, L., et al., 2011 Mar 1. Influence of gynecologic oncologists on the survival of patients with endometrial cancer. J. Clin. Oncol. 29 (7), 832–838.

Earle, C.C., Schrag, D., Neville, B.A., Yabroff, K.R., Topor, M., Fahey, A., Trimble, E.L.,

Bodurka, D.C., Bristow, R.E., Carney, M., Warren, J.L., 2006 Feb 1. Effect of surgeon specialty on processes of care and outcomes for ovarian cancer patients. J. Natl. Cancer Inst. 98 (3), 172–180.

Erikson, C., Salsberg, E., Forte, G., Bruinooge, S., Goldstein, M., 2007 Mar. Future supply and demand for oncologists: challenges to assuring access to oncology services. J. Oncol. Pract. 3 (2), 79–86. http://dx.doi.org/10.1200/JOP.0723601.

Garg, G., Shah, J.P., Toy, E.P., Field, J.B., Bryant, C.S., Liu, J.R., Morris, R.T., 2011 Apr. Intra-operative detection of nodal metastasis in early stage cervical cancer: a survey of the practice patterns of SGO members. Gynecol. Oncol. 121 (1), 143–147. http://dx.doi.org/10.1016/j.ygyno.2010.12.337. (Epub 2011 Jan 26).

Gunderson, C.C., Tergas, A.I., Fleury, A.C., Diaz-Montes, T.P., Giuntoli II, R.L., 2013 Sep. Primary uterine cancer in Maryland: impact of distance on access to surgical care at high-volume hospitals. Int. J. Gynecol. Cancer 23 (7), 1244–1251. http://dx.doi.org/10.1097/IGC.0b013e31829ea002.

Karjalainen, S., 1990 Sep. Geographical variation in cancer patient survival in Finland: chance, confounding, or effect of treatment? J. Epidemiol. Community Health 44 (3), 210–214.

Kumpulainen, S., Grénman, S., Kyyrönen, P., Pukkala, E., Sankila, R., 2002 Dec 10. Evidence of benefit from centralised treatment of ovarian cancer: a nationwide population-based survival analysis in Finland. Int. J. Cancer 102 (5), 541–544.

Mullee, M.A., De Stavola, B., Romanengo, M., Coleman, M.P., 2004 Jun 1. Geographical variation in breast cancer survival rates for women diagnosed in England between 1992 and 1994. Br. J. Cancer 90 (11), 2153–2156.

Silverman, D., 2000. Doing Qualitative Research: A Practical Handbook. Sage, London.

Ward, M.M., Jaana, M., Wakefield, D.S., Ohsfeldt, R.L., Schneider, J.E., Miller, T., Lei, Y., 2004 Fall. What would be the effect of referral to high-volume hospitals in a largely rural state? J. Rural. Health 20 (4), 344–354.

Worley MJ Jr, Rauh-Hain JA, Sandberg EM, Muto MG. Venous thromboembolism prophylaxis for laparoscopic surgery: a survey of members of the Society of Gynecologic Oncology. Int. J. Gynecol. Cancer 2013 Jan;23(1):208–15. doi: https://doi.org/10.1097/IGC.0b013e318275c266.

Wright, J.D., Herzog, T.J., Siddiq, Z., et al., 2012 Nov 10. Failure to rescue as a source of variation in hospital mortality for ovarian cancer. J. Clin. Oncol. 30 (32), 3976–3982. http://dx.doi.org/10.1200/JCO.2012.43.2906. (Epub 2012 Oct 1).