ACS HPR INSTITUTE
American College of Surgeons
Health Policy Research Institute

Surgical Deserts in the US: Places Without Surgeons

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Quick Facts

Number of surgeons in 2006:
133,796

Surgeons per 100,000 population in 2006:
44.7

Nearly 30% (925) of counties did not have an active surgeon in 2006. Of these counties:

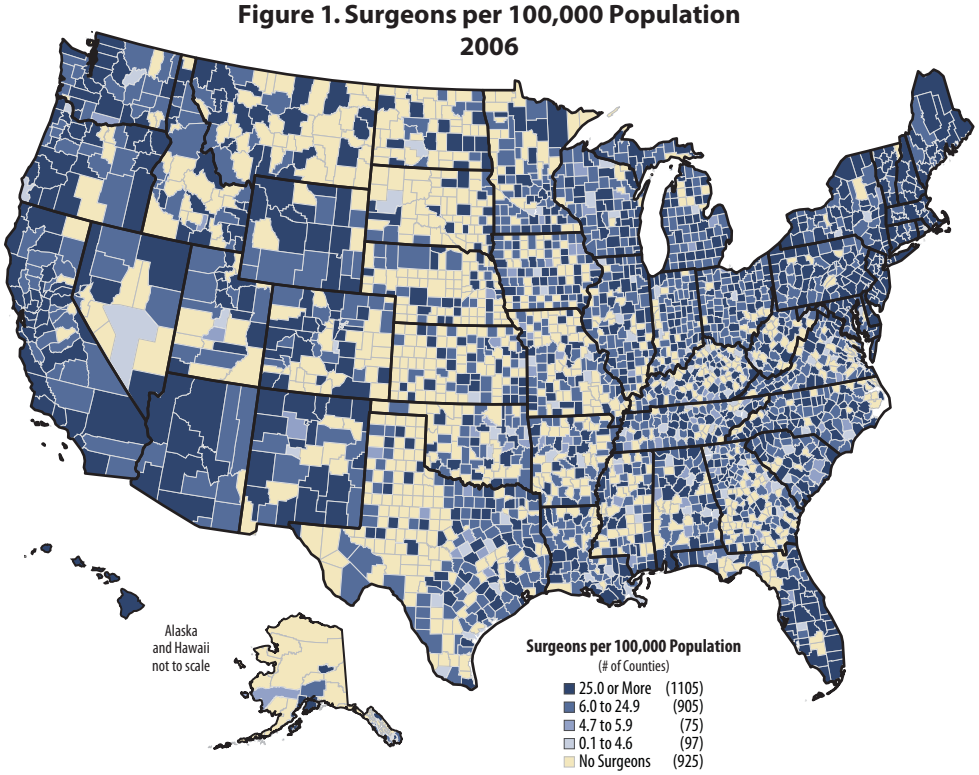
- *95% are rural*
- *84% are whole- or part-county HPSAs*
- *50% contain a hospital*

Mission Statement

The mission of the ACS Health Policy Research Institute is to improve our understanding of surgical patient care from a policy perspective in order to educate the public, federal and state governments, health care consumers, and the policy community to enable advocacy for superior, efficient, and compassionate surgical patient care. The goal of the Institute is to create a data driven, knowledge based program for examining issues related to surgical services, the surgical workforce, and public policies affecting surgery.

There were 133,796 surgeons in active, post-residency practice in the U.S. in 2006, yielding a national surgeon-to-population ratio of 44.7 surgeons per 100,000 persons. Like all physicians, surgeons are distributed unevenly across the United States, with more located in urban centers and fewer in rural communities (**Figure 1**). In 2006, thirty percent (925) of the 3,107 US counties lacked a single surgeon and nearly 9.5 million Americans lived in those counties.

Figure 1. Surgeons per 100,000 Population 2006



Source: AMA Physician Masterfile, 2006.
Data include non-federal, non-resident, clinically active physicians less than 70 years old reporting a primary specialty classified by the ACS HPRI as surgery.
Produced By: American College of Surgeons Health Policy Research Institute, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Geographic Distribution

Counties without surgeons are concentrated in the rural parts of the country; ninety-five percent of the 925 counties without a surgeon in 2006 were classified as nonmetropolitan by the Office of Management and Budget (OMB). Places without

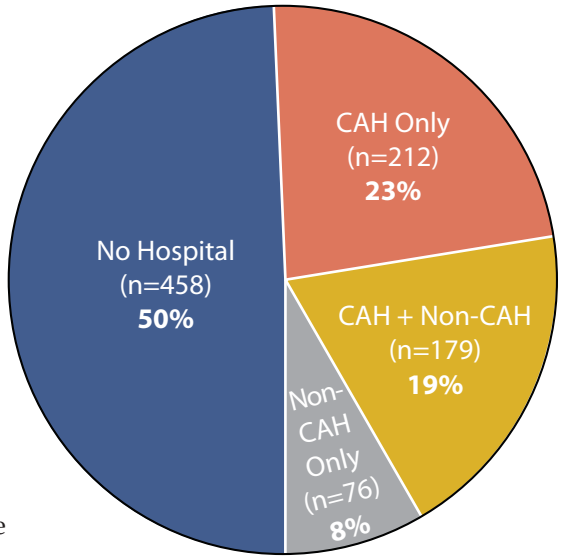
surgeons are also unevenly distributed regionally; just under one third of counties nationally and about that proportion in the Midwest, South, and West lacked a surgeon in 2006, while only 4% of counties in the Northeast did not have a surgeon in that year.

Most counties without surgeons are recognized as being underserved for primary care by the Bureau of Primary Health Care's[1] health professional shortage area (HPSA) designations. Of the 925 counties without a surgeon in 2006, eighty-four percent were classified as either a whole or part-county primary care HPSA. Physicians and psychiatrists practicing in HPSAs are eligible to receive Medicare bonus payments for professional fees.

Small and Disadvantaged Counties

Counties without hospitals are unlikely to have surgeons, particularly general surgeons, as their services depend on technology and staff that are associated with hospitals. Yet, 50% of counties without surgeons (467) do have hospitals, the majority of which are Critical Access Hospitals (Figure 2). Critical Access Hospitals (CAHs) are small rural hospitals in relatively isolated areas that provide inpatient and 24-hour emergency services and receive enhanced reimbursement from Medicare and Medicaid in many states. In 2006, 433 CAHs were located in counties without a surgeon.

Figure 2. Hospital Access in Counties Without A Surgeon, 2006
(n=925 Counties)



The distribution of surgeons is also tied to population, maintenance of a surgical practice depends on a minimum patient volume and the economic activity necessary to support a hospital or surgical center. Counties without surgeons are one tenth the size of those with one or more surgeons, on average (mean population 10,247 as compared to 132,856; see Figure 3). Eighty-nine percent of counties without a surgeon had populations of less than 10,000 people. Some larger communities lacked surgeons as well; fifty-seven counties without surgeons (6%) had populations of 25,000 or more, the largest of which contained 54,476 persons. The volume of surgery for counties with and without surgeons also varies with counties without surgeons having one quarter the number of inpatient surgeries (516/100k versus 2,042/100k) and one third the rate of outpatient surgeries (2,041/100k versus 6,012/100k).

Counties without surgeons have lower per capita incomes ($25,198 as compared to $28,227) and slightly higher proportions of their populations living below the Federal Poverty Level (16% as compared to 14%). The proportion of persons aged 65 and older are, on average, slightly higher in counties without surgeons (17% as compared to 14%).

Figure 3. Population Characteristics of Counties With and Without Surgeons

	1+ Surgeons	No Surgeons
Mean County Population, 2006	132,856	10,247
Mean Population Change 2001-2006	6,485	161
Mean Income per Capita (2005)	$28,227	$25,198
Mean % of Population in Poverty, 2005	14.1	16.1
Mean % Ages 65+, 2006	14.3	16.7
Mean % Ages 0-19, 2006	26.4	25.1
Mean % White, 2006	79.7	80.6
Mean % African American, 2006	9.1	7.8
Mean % Hispanic/Latino, 2006	7.2	7.3
Mean % American Indian, 2006	1.6	3.0

Population characteristics from the U.S. Census Bureau County Characteristics File for 2006 as reported in the 2007 Area Resource File.

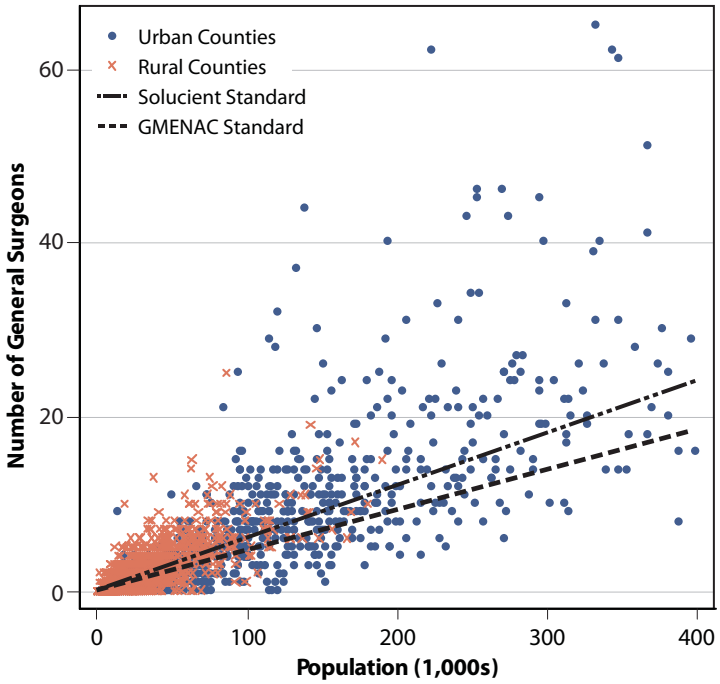
1. Agency within the U.S. Health Resources and Services Administration (HRSA).

How Many is Enough?

Developing benchmarks or ideal ratios of surgeons to population is challenging given the highly specialized nature of many surgeons' practices and the tendency of specialist providers to cluster around facilities in large urban centers. Standards do exist for general surgery. The 1980 Graduate Medical Education National Accreditation Council (GMENAC) report recommended 4.7 general surgeons per 100,000 population as the minimum acceptable ratio[2]. In 2004, the health care research and consulting firm Solucient issued a report recommending a minimum 6.01 general surgeons per 100,000 population nationally and slightly different ratios for counties within each Census Region[3].

Figure 4 plots the ratios of general surgeons to population (in 1,000s) for all counties with population of 400,000 or less (95%). The diagonal lines mark the GMENAC and Solucient recommended minimum per capita supply benchmarks. Counties marked with an 'X' are rural counties and those marked with an 'O' are urban counties.

Figure 4. General Surgeons by County Population, 2006



Discussion

The supply of surgeons in the United States is very uneven and this creates potential problems with access to surgical services. A substantial number of Americans must travel to the next county or beyond to receive necessary or lifesaving surgical treatment. While we know anecdotally that there is some degree of regionalization and sharing across facilities as generalist surgeons refer to subspecialists, less is known about whether this is an effective and sufficient strategy for meeting the surgical needs of communities. Further research is needed to answer this question and to understand the effects of the distribution of surgeons on the health of Americans.

A substantial portion of our country can be characterized as surgically underserved, despite several programs designed to help sustain health care services in underserved communities through enhanced reimbursement. For many places, these initiatives may not be sufficient to supplement a surgical practice. Understanding the characteristics of these communities and the dynamics of their local healthcare systems is important in considering new policies to increase local their surgical workforce or develop alternatives to satisfy unmet surgical needs.

Data and Methodology

AMA Physician Masterfile data representing all licensed physicians were analyzed for 2006. Census Bureau population data for the corresponding year were used to calculate provider to population ratios at the county, state and regional levels of analysis. Providers with a self-reported primary specialty of surgery (as identified in **Figure 5**) were included in the analysis. Only providers who identified their practice type as direct patient care, were 69 years old or younger and who reported a practice location within a U.S. county or county-equivalent (e.g. Federal

2. Health Resources Administration (1980). Report of the Graduate Medical Education Advisory Committee to the Secretary, Department of Health and Human Services. Volume II: GMENAC Member's Commentaries and Appendix. Report No. HPA-B1-657.

3. Solucient (2004). Physician Community Requirements in The 21st Century: The 2003 Physicians To Population Ratios. http://www.solucient.com/forms/physician_whitepaper.asp, Accessed June 4, 2009.

Information Processing Standard (FIPS) codes) were included in the analysis. Physicians were excluded from the analysis in a given year if they reported being in residency training, semi-retired, or if they reported their primary present employer was the U.S. Government, Locum Tenens, Medical School, or Other Non-Patient Care Employment. For the purpose of this analysis, counties were defined by FIPS codes, regions by the U.S. Census Bureau, and rural – urban was defined using the U.S. Office of Management and Budget's core based statistical area definitions for metropolitan and micropolitan areas. Population characteristics come from the U.S. Census County Characteristics File for 2006 and, in the case of income per capita and persons living in poverty, from the Census Regional Economic Information System for 2005 as reported in the Health Services and Resources Administration (HRSA) Area Resource File (ARF). County-level measures of health services infrastructure and utilization come from the American Hospital Association Annual Survey 2005 as reported in the ARF. Counts of Federally Qualified Health Centers are reported in the ARF from HRSA data for 2006. Counts of Critical Access Hospitals come from the Flex Monitoring Team website (http://www.flexmonitoring.org/) and include hospitals certified as CAHs as of 2006. ❖

Figure 5. Surgery Specialty Categories

Specialty Category	Included Specialties
General Surgery	**General Surgery**, Abdominal Surgery, Hand Surgery, Oral and Maxillofacial Surgery, Pediatric Surgery, Trauma Surgery, Transplant Surgery, Cardiovascular Surgery, Vascular Surgery, Surgical Critical Care, Surgical Oncology
Colorectal Surgery	Colorectal Surgery, Proctology
Dermatologic Surgery	Dermatologic Surgery, Procedural Dermatology
Neurosurgery	Neurological Surgery, Pediatric Neurological Surgery, Endovascular Surgical Neuroradiology
Obstetrical & Gynecological Surgery	Gynecology Oncology, Gynecology, Obstetrics & Gynecology, Obstetrics, Critical Care Medicine OB/GYN
Orthopedic Surgery	Hand Surgery - Orthopedics, Adult Reconstructive Orthopedics, Foot & Ankle Surgery, Musculoskeletal Medicine, Pediatric Orthopedics, Orthopedic Surgery, Sports Medicine, Orthopedic Spine Surgery, Orthopedic Trauma
Ophthalmic Surgery	Ophthalmology, Pediatric Ophthalmology
ENT Surgery	Head & Neck Surgery, Otology/Neurotology, Otology, Otolaryngology, Pediatric Otolaryngology
Plastic Surgery	Craniofacial Surgery, Cosmetic Surgery, Facial Plastic Surgery, Hand Surgery Plastics, Plastic Surgery, Plastic Surgery within the Head & Neck
Thoracic Surgery	Thoracic Surgery, Pediatric Cardiothoracic Surgery
Urologic Surgery	Urology, Pediatric Urology

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