

## Quick Facts

The U.S. surgical workforce increased by 53% from 1981 to 2006.

Number of surgeons in 1981:  
87,345

Number of surgeons in 2006:  
133,796

Nearly 30% (903) counties did not have an active general surgeon in 1981 or 2006.

## 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.

Between 1981 and 2006, the U.S. surgical workforce increased by 53% from 87,345 to 133,796 surgeons. During the same time period, the national population grew 31%. This raised the per capita surgeon supply from 38.1 to 44.7 surgeons per 100,000 persons. However, most of the gains during the 25-year period were attained by the early 1990s, after which growth tapered and even reversed for general surgery. Furthermore, data suggest a worsening problem of geographic distribution of surgeons in future years.

## General Surgery

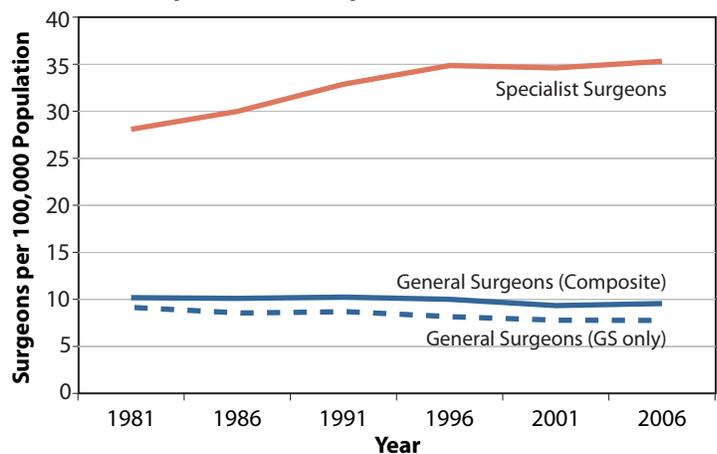
Growth in the surgical workforce during the 25-year period was fueled by an increase in physicians in surgical sub-specialty groups at the expense of general surgery. Only 4% (1,881) of the 46,451 net gain in surgeons between 1981 and 2006 were general surgeons; an additional 3,349 (7.2%) were in specialties requiring prior certification in general surgery (we group these surgeons with general surgeons in the general surgery “composite” classification—See **Figure 7**).

General surgery decreased as a proportion of the total surgical workforce from 24% in 1981 to 18% by 2006, reflecting both the slow growth of general surgeons and the expansion of several specialty groups such as OB/GYN, orthopedic, plastic and thoracic surgery.

## Recent Slowdown in Surgery Workforce Growth

Analysis shows unsteady growth in the surgical workforce, particularly for general surgery, between 1981 and 2006 (**Figures 1 and 2**). The net change in surgeon supply varied considerably for both general surgery and surgical specialties during each five-year interval of the study period, and growth for all surgeons has slowed considerably since 1996. Surgical specialties had double-digit growth in each period until 1996, when growth

**Figure 1. U.S. Specialist and General Surgeons per 100,000 Population, 1981-2005**



slowed to approximately 7% in each of the two subsequent periods. General surgery growth was up and down, peaking in 1991 and again in 2006, but with nominal or negative growth in the other periods. Meanwhile, population growth was fairly consistent, hovering around 5% during each five-year interval, with the exception of 1996-2001 when it increased by 7.5%.

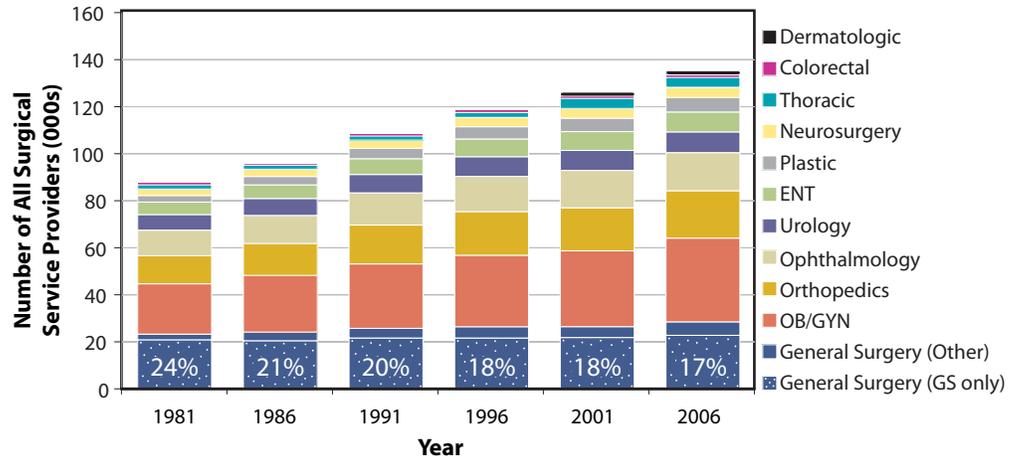
Amidst these inconsistent trends, what appears consistent is a sudden slowdown in the surgery workforce growth beginning sometime after 1991.

### Geographic Maldistribution

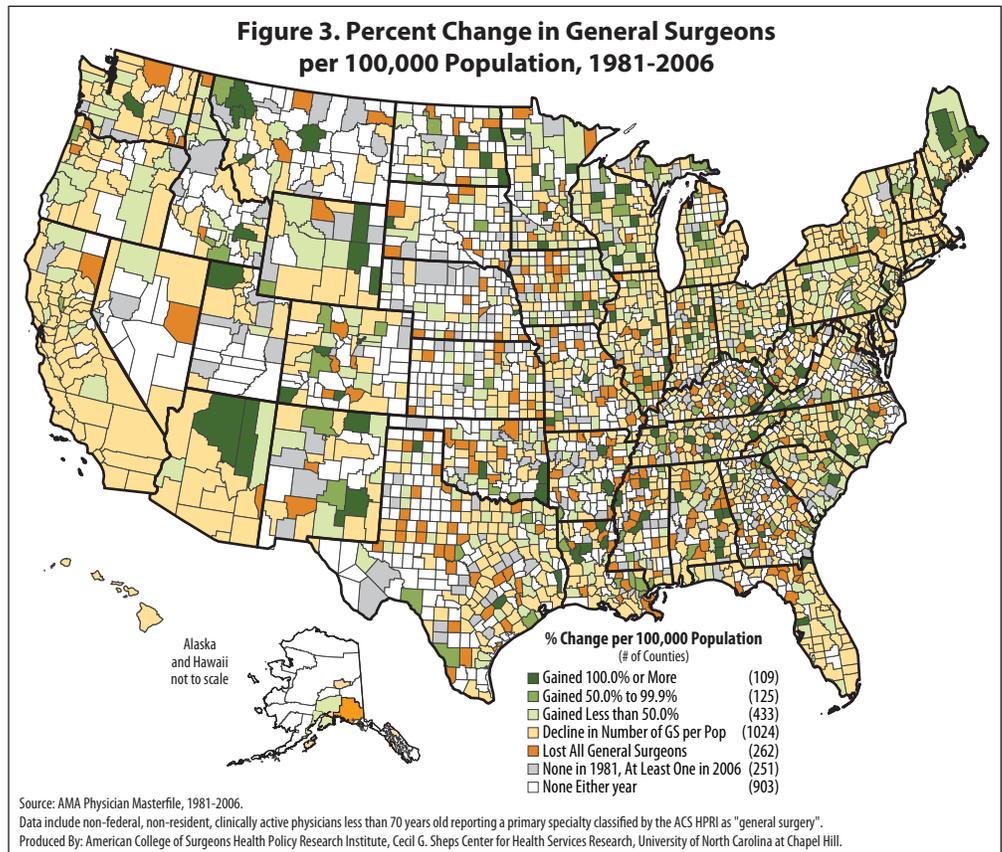
To examine geographic variation in the surgical workforce supply, we analyzed physician and population data for all U.S. counties in the United States over the 25-year period. Overall, we found that the average surgeon to population ratios held steady or improved in more than three quarters of U.S. counties for all surgeons, but the general surgery to population ratio declined in 41% of counties between 1981 and 2006 (Figure 3). More than half of all counties experienced an increase in surgeon to population ratios between 1981 and 2006, while a smaller percentage (30%) of

counties gained general surgeons. The number of counties with no surgeons declined steadily over the 25-year period such that 925 counties (30%) had none by 2006, a slight improvement from 1981 when 1025 (33%) had none. As expected, more counties had no general surgeons throughout the 25-year period; however, in contrast with the improvements observed the ratio of all surgeons to population, we found that the number of counties with an inadequate supply of general surgeons (fewer than 4.7 per 100,000 population as recommended by Graduate Medical Education

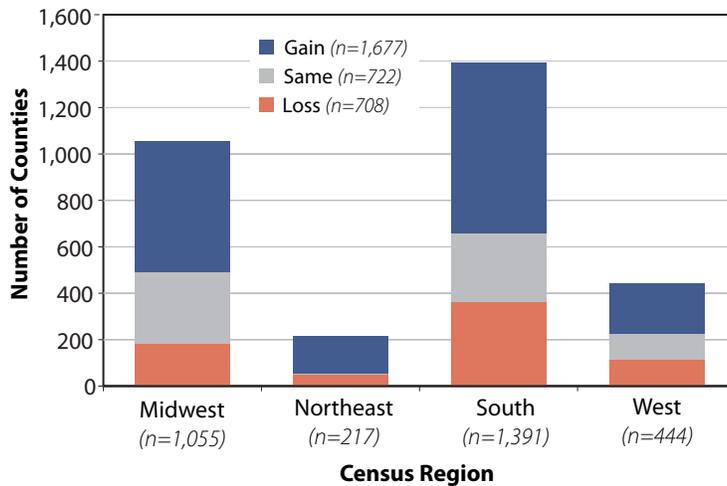
**Figure 2. Growth in the U.S. Surgical Workforce by Primary Specialty, 1981-2005**



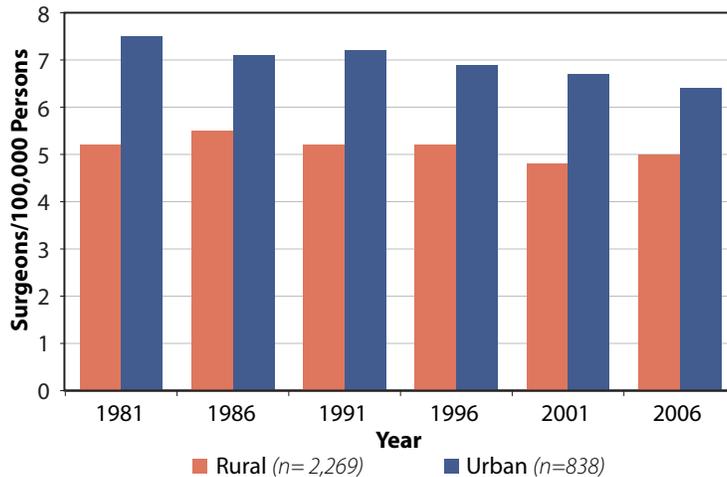
**Figure 3. Percent Change in General Surgeons per 100,000 Population, 1981-2006**



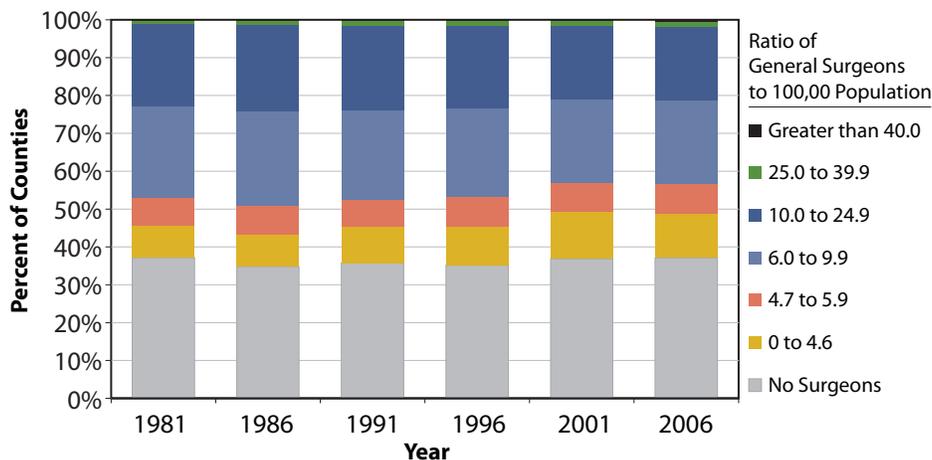
**Figure 4. County Change in Surgeon to Population Ratio 1981-2006, All Surgeons By Region**



**Figure 5. County Ratio of General Surgeons per 100,000 Persons, 1981- 2006**



**Figure 6. County Surgeon to Population Ratios, 1981 - 2006**



National Advisory Committee - GMENAC<sup>1</sup>) increased in every time period since 1986.

Just under one quarter (709) of all counties had fewer surgeons per 100,000 residents in 2006 than in 1981. Approximately 82.2 million people (27.4% of the U.S. population) resided in these counties that experienced a decline in surgeon to population ratios in 2006. Regional variations in the gain or loss of surgeons show that counties in the Northeast experienced significant gains while losses were more common in the South (Figure 4).

### Geography and Trends in Supply

Change in the geographic distribution of general surgeons was slightly worse than for all surgeons between 1981 and 2006. Approximately 41% of all counties experienced a declining ratio of general surgeons per 100,000 people, and a disproportionate number of those counties were urban. Whereas 34% (781) of rural counties had declining general surgeon to population ratios during the 25-year period, 60% (506) of all urban counties experienced declining ratios (Figure 5). Regional patterns of change in surgeon to population ratios for general surgeons did not mirror those for all surgeons. In every region of the country (and particularly in the Northeast) more counties experienced declines in general surgeon to population ratios than experienced increases. Consistent with other findings, these data suggest that there has been a substantial

loss of general surgeons across the nation and that this loss has been greatest in urban areas where surgical specialists have grown more rapidly.

In 1981, one third (1,025) of all U.S. counties had no practicing surgeons (Figure 6). By 2006, 303 of those counties gained a surgeon but 203 others had lost all surgeons. These 925 counties without a surgeon had a collective population of 14.7 million people in 2006.

<sup>1</sup> Graduate Medical Education National Advisory Committee (1980). Report to the Secretary, Department of Health and Human Services, Geographic Distribution Technical Panel Vol III. (DHHS Publication No. HRA 81-653). Washington, DC.

## Implications

Although the overall surgical workforce experienced considerable growth during the 25-year period 1981-2006, the supply of general surgeons has not kept pace with population growth or the expansion of other surgical specialty surgeons and even more continue to lose surgeons, particularly generalists. These trends have implications for access to care, as the competencies of general surgeons are broader than surgical specialists and include emergency and trauma care. Further, the failure of general surgery to keep pace with population growth has resulted in a significant number of areas that do not meet the minimum standard of geographic access to surgical care, as defined by GMENAC. These findings are important from the perspective of medical training and workforce planning, in that new policies may be necessary to increase the number of general surgeons through a program similar to the National Health Service Corps' loan repayment program or focused support for residency training.

**Figure 7. Surgery Specialty Categories**

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

## Data and Methodology

AMA Physician Masterfile data representing all licensed physicians were analyzed in six consecutive periods separated by five years each. Census Bureau population data for corresponding years was 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 7**) 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 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. ❖

**ACS | HPR**  
INSTITUTE

American College of Surgeons  
Health Policy Research Institute

*Advancing Health Policy Information for Surgery in the United States*

725 Martin Luther King Jr. Blvd. • CB# 7590 • Chapel Hill, NC 27599-7590

www.acshpri.org • Phone: 919/966-9425 • Fax: 919/966-5764 • Email: acs-hpri@facs.org