Quick Facts
In 2009, 828 HSAs had no general surgeons.

In 2009, a total of 4,558,732 people lived in the areas without surgeons.

Since they were developed in 1993, HSAs have not been updated to include hospital closures or changes in service lines. As a result, 157 of the HSAs had no hospital in 2009.

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.

A substantial number of Americans must travel to the next county or beyond to receive necessary or lifesaving surgical treatment. Concern for patients with limited access to surgical care and the effects of a shrinking supply of general surgeons are two policy issues that the Affordable Care Act (ACA) addresses with a new payment incentive for surgeons who practice in underserved areas. The ACA calls for the Centers for Medicare and Medicaid Services (CMS) to pay a 10 percent bonus to general surgeons who perform major surgery in health professional shortage areas (HPSAs) (Subtitle F, Section 5501). A problem with this new policy is that eligibility for the bonus payment is based on surgical procedures performed in primary care HPSAs. Primary care HPSAs were developed to identify places and populations without access to primary care physicians, not surgeons. In order to accurately determine the surgeons’ eligibility for the bonus payment and to identify systems and regions at risk for lower quality care and access due to a shortage of surgery resources, HPSA designations should be reconsidered with surgical care access in mind. This article provides guidance for the development of a surgical HPSA designation from the American College of Surgeons (ACS) Health Policy Research Institute (HPRI).

Defining Local Surgical Care Markets
The geographic areas upon which this analysis is based are hospital service areas (HSAs), developed by the Dartmouth Atlas of Health Care Project. HSAs were constructed in the early 1990s to identify local health care markets, and were centered on hospitals using ZIP code-based Medicare patient origin data from 1992 to 1993. Based on this historical Medicare claims data, 3,436 HSAs were defined by assigning ZIP codes to the hospital area where the majority of Medicare patients had been hospitalized. This methodology aggregated 42,000 ZIP codes into 3,436 HSAs in 1993; of these, 2,830 had a single hospital, 332 had two, 106 had three, and 178 had four or more hospitals.

Figure 1: Number of hospitals in HSAs in 2009

- 1 hospital: 329 (10%)
- 2 hospitals: 1,584 (51%)
- 3 hospitals: 1,570 (51%)
- 4+ hospitals: 61 (4%)
- Total: 3,436

Figure 1 shows the distribution of hospitals within HSAs in 2009.
Since HSAs were developed, health care utilization has changed due to the closure of hospitals and changes in service lines. However, HSA boundaries have not been updated except to accommodate changes in the division and redrawing of ZIP code boundaries by the U.S. Postal Service. As a result, 157 of the HSAs had no hospital in 2009 (see Figure 1, page 1). Before creating a final surgical HPSA designation, it will be essential to update HSA boundaries using more recent patient origin data to account for changes in practices in addition to hospital closings and openings. In the absence of an updated set of boundaries, the distributions and thresholds described at this preliminary stage make use of the Dartmouth Atlas’ original 3,436 HSAs.

Figure 2: Potential Surgical HPSAs
Dartmouth HSAs using 2009 Supply Data


Population Is Also a Factor

In addition to hospitals, the distribution of surgeons is also tied to population, as maintenance of a surgical practice depends on a minimum patient volume and the economic activity necessary to support a hospital or surgical center. Within the original 3,436 HSAs, the average ratio of total surgeons to population in 2009 was 27.9 per 100,000, and for general surgeons, 7.2 per 100,000. A total of 608 areas had no surgeons of any specialty, and 828 had no general surgeons. A total of 4,558,732 people lived in the areas without surgeons, the largest area with a population of 53,233 and the smallest with a population of 649. These 608 areas with no surgeons would readily qualify as surgical HPSAs if the criteria included a requirement that the population be included in a “rational service area” for inpatient care, and the standard was based on the existing HSA definition. However, not all of those areas have a hospital or can actually support a general surgeon.

Defining a Critical Shortage of Surgeons

Although there is no formal consensus on the optimal number of surgeons necessary to treat a population, there are discussions and reports that contend that 6.0 general surgeons per 100,000 reflects a minimum number that can meet population needs. We suggest that a level of 3.0 general surgeons per 100,000 would constitute a “critical” shortage and propose to set that as a threshold. This ratio is based on the idea that an area capable of supporting a general surgeon should have 15,000 to 20,000 people—or a ratio of between 5.0 and 6.0 surgeons per 100,000 population. If an area with 30,000–40,000 people had only one surgeon, then adding another full-time surgeon would bring the area into the acceptable surgeon-to-population range. Our analysis shows that in 2009, 28 percent (962) of HSAs in the U.S. had fewer than 3.0 general surgeons per 100,000 population—constituting a critical shortage. These critical shortage areas included more than 21,412,439 persons and ranged in size from 649 to 437,029 people. There were 269 general surgeons indicating a primary practice location in these potential critical shortage areas in 2009. Given the current practice of surgery in smaller hospitals, there are likely to be additional part-time surgeons who operate in hospitals in those HSAs. A decision about their eligibility for the bonus will have to be made prior to establishing a surgical HPSA rule.

Proposed Surgical HPSA Based on Existing HSAs Boundaries

Figure 2 on page 2 is a map of HSAs with the potential surgical HPSAs identified with shading indicating severity of shortage. The potential surgical HPSAs are spread across the nation, with the only apparent clustering in the largely rural areas of the states in the center of the nation, from North Dakota to Texas. The problem of low access to surgical services is indeed a national problem and one that requires national attention.

Implications

This definition of the surgical HPSA under development will not be intended solely for application of the bonus payment, but as a step toward identifying systems and regions that are at risk for lower quality care and access due to a shortage of surgery resources, such as hospitals. Many areas are struggling to support a small hospital. For example, more than half (592) of the HSAs with potential critical surgeon shortages have only critical

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2 The U.S. Department of Health and Human Services Health Resources and Services Administration requires primary care HPSAs to be based on rational service areas for primary care services. These may be an entire county or a subdivision of a county or cross county boundaries. In the case of the surgical HPSA, the rational service area would be defined by use patterns for surgical services.

access hospitals (CAHs) (see Figure 3). For many of these hospitals, the presence of a surgeon is essential for their survival and their integration into effective systems of care. Likewise, if a community lacks the basic resources to support surgical procedures, incentives to attract surgeons are irrelevant.

In addition to highlighting areas that may not have the resources to support surgery, this analysis shows that the current HSA definitions are not adequate for the development of a surgical HPSA methodology. The ACS HPRI is redefining HSAs based on similar, but updated, data.

Data and Methodology
The American Medical Association (AMA) Physician Masterfile data from 2009 representing all licensed physicians was analyzed along with 2009 U.S. Census Bureau population data and the Dartmouth HSA boundary file to calculate surgeon-to-population ratios in HSAs. Providers with a self-reported specialty of surgery and certification in surgery by the American Board of Medical Specialties 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 (for example, 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. ✴