

# Is There a Shortage of Anesthesia Providers in the United States?

Anesthesia is an important medical specialty provided by highly skilled professionals: Anesthesiologists (ANs) and Certified Registered Nurse Anesthetists (CRNAs). ANs are physicians trained to deliver anesthesia and certified by professional boards to manage complicated medical and surgical situations. CRNAs are licensed professionals who have master's degrees and training to participate in anesthesia delivery. There are approximately 40,000 ANs and 39,000 CRNAs and student CRNAs practicing in the United States. In most states, CRNAs must work under a physician's supervision, although 15 states now have opted out of this requirement. In general, these two professional groups provide complementary services, though there is continuing debate over the appropriate division of labor between them.

However, overshadowing this debate has been growing concern over whether the United States is facing a shortage of anesthesia providers. Anecdotal evidence suggests that such a shortage exists. If true, this could limit access to high-quality care, especially in light of growing demand for surgical and interventional procedures for an aging population. Understanding current and future demand and supply for anesthesia services is therefore critical for policymakers, regulators, and professional bodies, because markets for highly specialized medical services are difficult to balance. Limits on the number of training positions, regulation of permission to practice, and a limited capacity for wages to

**Key findings:**

- The United States is experiencing a shortage of anesthesiology providers, including both Anesthesiologists (ANs) and Certified Registered Nurse Anesthetists (CRNAs).
- Projections of current trends suggest that, by 2020, the shortage of ANs will persist, but under a reasonable set of assumptions there will be a surplus of CRNAs.
- Labor markets for anesthesia specialists showed substantial variation across regions and across states within a region, suggesting that state-level approaches to addressing shortages may be the most promising options.

respond to market conditions can all lead to national or local surpluses or shortages in the absence of proper workforce planning.

To inform such planning decisions, a team from RAND Health examined anesthesia labor markets in the United States. The study addressed two main questions:

- Is there a shortage or surplus of anesthesia specialists?
- What are the demographic patterns, employment arrangements, usages of time across different types of procedures, and working patterns present in the AN and CRNA labor markets?

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of published, peer-reviewed documents.

Corporate Headquarters  
 1776 Main Street  
 P.O. Box 2138  
 Santa Monica, California  
 90407-2138  
 TEL 310.393.0411  
 FAX 310.393.4818

© RAND 2010

**This Highlight summarizes RAND Health research reported in the following publication:**

Daugherty L, Fonseca R, Kumar KB, and Michaud P-C, *An Analysis of the Labor Markets for Anesthesiology*, Santa Monica, Calif.: RAND Corporation, TR-688-EES, 2010 (available at [http://www.rand.org/pubs/technical\\_reports/TR688/](http://www.rand.org/pubs/technical_reports/TR688/)).

To address these questions, the team first conducted a national survey of ANs, CRNAs, and hospital anesthesiology directors to gather data on work practices, wages, time usage, and procedure volumes for the year 2007. Next, the team used an econometric model that drew data from these surveys and incorporated state-level variables (such as the percentage of the population over age 65, health maintenance organization [HMO] penetration, and capacity of medical facilities) to estimate the supply of and demand for AN and CRNA services. This approach can be used to calculate both national- and state-level shortages or surpluses. The results from this approach are presented in the next section.

## Results

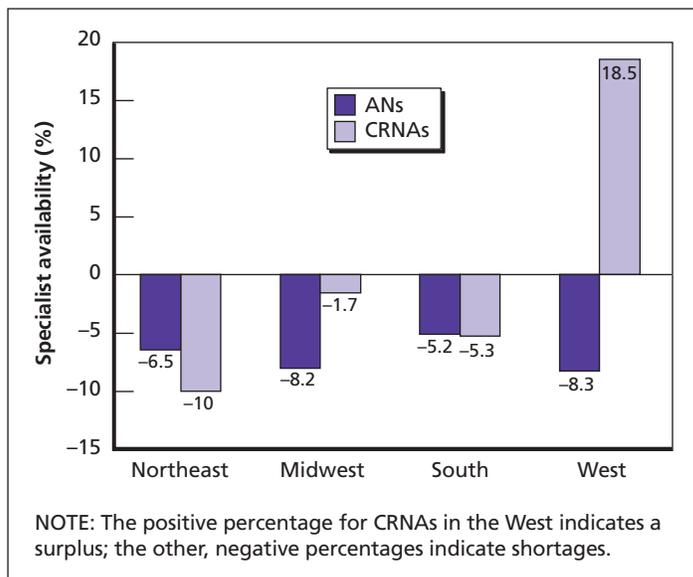
**There are shortages of ANs and CRNAs nationwide.** The researchers estimated that, as of 2007, there was a nationwide shortage of 3,800 ANs and 1,282 CRNAs, or 9.6 percent and 3.8 percent of the total anesthesiology-provider workforce, respectively.

- Shortages of ANs were spread evenly across all regions of the United States. Shortages of CRNAs were particularly acute in the Northeast, while some states in the West showed surpluses (see Figure 1).
- There was considerable variation across states. Just over half (54 percent) of states were experiencing shortages of ANs, and about 60 percent of states a shortage of CRNAs (see Figure 2).
- While labor-market patterns varied when examined by region, variation by state was even more pronounced. For example, Delaware had a surplus of ANs, while New York, in the same region, had a 28-percent shortage of CRNAs. Nevada had a 53-percent surplus of CRNAs, while Idaho, in the same region, had a 46-percent shortage of ANs.

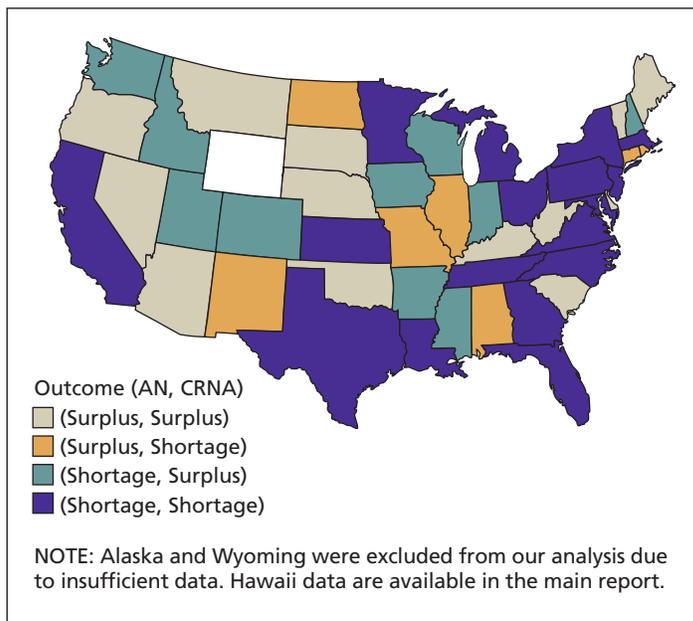
### Shortages will persist until 2020 in some scenarios.

The team also estimated future trends in anesthesiology labor markets, using different scenarios for changes in supply and demand. These scenarios assumed that current trends would continue; the analysis did not consider possible sudden changes in the demand for or supply of anesthesia providers. Baseline scenarios (which assumed balanced labor markets initially, a 1.6-percent annual increase in demand for both groups, a 0.67-percent net annual increase in the supply of ANs, and a 3-percent net annual increase in the supply of CRNAs) showed a projected shortage of 4,479 ANs by 2020 and a surplus of 7,970 CRNAs. However, under some other scenarios, the situations were reversed for each group. For instance, an entry rate into the AN profession exceeding 2.76 percent will cause a surplus, and an annual growth in demand exceeding 3 percent will cause a shortage of CRNAs.

**Figure 1**  
Current Availability of Anesthesia Specialists, by Region



**Figure 2**  
Availability of Anesthesia Specialists, by State



**Patterns of work for each profession differed markedly.** ANs worked more hours per week and made about twice as much annually as CRNAs (see table). ANs spent a greater percentage of their time on general anesthesia, while CRNAs spent more time than ANs on monitored anesthesia care (MAC, in which a patient is sedated but remains responsive). ANs were much more likely than CRNAs to work in urban locations (95 percent versus 44 percent, respectively).

### National Work Patterns of ANs and CRNAs

<b>Indicator</b>	<b>ANs</b>	<b>CRNAs</b>
Average age	49 years	49 years
Average experience	16 years	17 years
Urban location	95%	44%
Average annual income	\$337,551	\$151,380
Average clinical workweek	49 hours	37 hours
Time in MAC	16%	25%

### Implications for Policy

The study's key finding is that the United States is currently experiencing a shortage of both ANs and CRNAs, although this varies across regions and states. Under most scenarios, there will be a shortage of ANs but a surplus of CRNAs by 2020. These results have important implications for workforce planning. Residency positions for ANs and certifications for CRNAs that are controlled by professional decision-making bodies could be increased in the case of shortages (such as the ones found nationally). Moreover, since labor markets are heterogeneous, planning issues would have to be addressed at the state level. ■

The research was supported by Ethicon Endo-Surgery, Inc.

---

Abstracts of all RAND Health publications and full text of many research documents can be found on the RAND Health website at [www.rand.org/health](http://www.rand.org/health). This highlight was written by David M. Adamson. The RAND Corporation is a nonprofit research institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. **RAND**® is a registered trademark.

**RAND Offices**

Santa Monica, CA • Washington, DC • Pittsburgh, PA • New Orleans, LA/Jackson, MS • Boston, MA • Doha, QA • Cambridge, UK • Brussels, BE



# HEALTH

THE ARTS  
CHILD POLICY  
CIVIL JUSTICE  
EDUCATION  
ENERGY AND ENVIRONMENT  
HEALTH AND HEALTH CARE  
INTERNATIONAL AFFAIRS  
NATIONAL SECURITY  
POPULATION AND AGING  
PUBLIC SAFETY  
SCIENCE AND TECHNOLOGY  
SUBSTANCE ABUSE  
TERRORISM AND  
HOMELAND SECURITY  
TRANSPORTATION AND  
INFRASTRUCTURE  
WORKFORCE AND WORKPLACE

This PDF document was made available from [www.rand.org](http://www.rand.org) as a public service of the RAND Corporation.

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of individual published, peer-reviewed documents or of a body of published work.

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

---

## Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

## For More Information

Visit RAND at [www.rand.org](http://www.rand.org)

Explore [RAND Health](#)

View [document details](#)

## Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).