BACKGROUND
 • The COVID-19 pandemic strained the US hospital system infrastructure including workforce and other resources (e.g., ventilators).1
 • Critical care infrastructure and the ability to increase capacity are essential to a public health pandemic response.2

RURAL CRITICAL CARE CAPACITY
 • Health care infrastructure and workforce are concentrated in metro areas.4
 • Populations in rural areas tend to be older. Rural communities tend to have higher poverty, unemployment, and increased mortality risk from certain health conditions.4,5
 • Some small metro counties (e.g., Yuma) and rural counties (e.g., Apache, Navajo) in Arizona have higher COVID-19 cases per 100,000 population compared to larger metro counties (e.g., Pima, Maricopa), but fewer health care resources.2

FINDINGS
 • Health care and critical care infrastructure and workforce are concentrated in Arizona’s metro counties (Map, p. 2).
 • The counties with the highest COVID-19 case rates (as of March 1, 2021) per 100,000 population are smaller rural counties (Navajo, Apache, Graham Counties) with less health care and critical care infrastructure and resources.
 • Across Arizona’s 15 counties, 14 have critical care physicians, 13 have critical care nurses, and 10 have respiratory therapists. The ratio of providers per 10,000 population varies across counties.

ARIZONA’S CRITICAL CARE WORKFORCE

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>ICU Beds</th>
<th>Physicians</th>
<th>Critical Care Nurses</th>
<th>Respiratory Therapists</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>1,533</td>
<td>1,353</td>
<td>1,275</td>
<td>268</td>
</tr>
</tbody>
</table>

Suggested citation: Koch B, Coates S, Drake, C, and Derksen D. (2021) Arizona Health Workforce Profile: Critical Care. For questions or comments about this brief contact: Bryna Koch brynak@email.arizona.edu.
Hospitals, ICU Beds, Critical Care Physicians, Critical Care Nurses & Respiratory Therapists

<table>
<thead>
<tr>
<th>County</th>
<th># Hospitals</th>
<th># ICU beds</th>
<th>Critical Care MDs per 10,000 pop</th>
<th>Critical Care Nurses per 10,000</th>
<th>Respiratory Therapists per 10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mohave</td>
<td>3</td>
<td>40</td>
<td>2.5</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Coconino</td>
<td>4</td>
<td>44</td>
<td>3.4</td>
<td>1.4</td>
<td>1.8</td>
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<tr>
<td>Arizona</td>
<td>99</td>
<td>1,533</td>
<td>2.5</td>
<td>1.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Navajo</td>
<td>3</td>
<td>12</td>
<td>2.5</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Apache</td>
<td>1</td>
<td>0</td>
<td>2.5</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Yavapai</td>
<td>5</td>
<td>39</td>
<td>2.5</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>La Paz</td>
<td>1</td>
<td>3</td>
<td>1.4</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Maricopa</td>
<td>54</td>
<td>944</td>
<td>2.0</td>
<td>0.2</td>
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</tr>
<tr>
<td>Pima</td>
<td>15</td>
<td>347</td>
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<tr>
<td>Pinal</td>
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<td>0.4</td>
</tr>
<tr>
<td>Santa Cruz</td>
<td>1</td>
<td>4</td>
<td>2.5</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Cochise</td>
<td>4</td>
<td>12</td>
<td>1.4</td>
<td>0.2</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Note 1: In this brief, critical care refers to hospitals, ICU beds, and the healthcare workforce of critical care physicians and nurses, and respiratory therapists. The hospital and ICU data for the table on p. 1 and this map are from the ADHS Uniform Accounting Report (UAR) data 2018. Not all hospitals submit this report, so this data does not include federal, Indian Health Service, or PL-638 tribal facilities. There are 3 additional hospitals of these types in Apache, Maricopa, and Navajo counties; 2 in Pima county; and 1 in Cochise, Coconino, Gila, La Paz, Pinal, Yavapai, and Yuma counties. Some of these facilities may have ICU beds that are not included in this data because they are not reported in the UAR. This data is likely an undercount of total hospitals and available ICU beds and inquiries regarding the most up to date data should be made to ADHS.
Total Critical Care Workforce by County

### Physicians
- **Large Counties:**
  - Maricopa: 857
  - Pima: 270

- **Medium Counties:**
  - Mohave: 52
  - Coconino: 48
  - Yavapai: 35
  - Yuma: 22
  - Cochise: 18
  - Pinal: 15

- **Small Counties:**
  - Navajo: 14
  - Gila: 10
  - Graham: 4
  - Apache: 4
  - Santa Cruz: 2
  - La Paz: 2
  - Greenlee: 0

### Nurses
- **Large Counties:**
  - Maricopa: 927
  - Pima: 161

- **Medium Counties:**
  - Coconino: 46
  - Yavapai: 32
  - Mohave: 29
  - Yuma: 18
  - Cochise: 18
  - Pinal: 10

- **Small Counties:**
  - Navajo: 15
  - Graham: 7
  - Apache: 5
  - Gila: 4
  - Santa Cruz: 3
  - La Paz: 0
  - Greenlee: 0

### Respiratory Therapists
- **Large Counties:**
  - Pima: 122
  - Maricopa: 72

- **Medium Counties:**
  - Coconino: 37
  - Yavapai: 8
  - Mohave: 4
  - Cochise: 3
  - Yuma: 0
  - Pinal: 0

- **Small Counties:**
  - Apache: 13
  - Santa Cruz: 7
  - Navajo: 1
  - Gila: 1
  - La Paz: 0
  - Greenlee: 0
  - Graham: 0

**Critical Care Workforce Ratio per 10,000 Population by County**

### Physicians
- **Large Counties:**
  - Pima: 2.6
  - Maricopa: 2.0

- **Medium Counties:**
  - Coconino: 3.4
  - Mohave: 2.5
  - Yavapai: 1.6
  - Cochise: 1.4
  - Yuma: 1.1
  - Pinal: 0.4

- **Small Counties:**
  - Gila: 1.9
  - Navajo: 1.3
  - Graham: 1.1
  - La Paz: 1.0
  - Apache: 0.6
  - Santa Cruz: 0.4
  - Greenlee: 0.0

- **Arizona:** 1.95

### Nurses
- **Large Counties:**
  - Maricopa: 2.2
  - Pima: 1.6

- **Medium Counties:**
  - Coconino: 3.3
  - Yavapai: 1.4
  - Mohave: 1.4
  - Cochise: 1.4
  - Yuma: 0.5
  - Pinal: 0.4

- **Small Counties:**
  - Graham: 1.8
  - Navajo: 1.4
  - Gila: 0.7
  - Apache: 0.7
  - Santa Cruz: 0.6
  - La Paz: 0.0
  - Greenlee: 0.0

- **Arizona:** 1.8

### Respiratory Therapists
- **Large Counties:**
  - Pima: 1.2
  - Maricopa: 0.2

- **Medium Counties:**
  - Coconino: 2.6
  - Yavapai: 0.4
  - Mohave: 0.2
  - Cochise: 0.2
  - Yuma: 0.0
  - Pinal: 0.0

- **Small Counties:**
  - Apache: 1.8
  - Santa Cruz: 1.5
  - Navajo: 0.2
  - Gila: 0.1
  - La Paz: 0.0
  - Greenlee: 0.0
  - Graham: 0.0

- **Arizona:** 0.4
METHODS & DATA

• This brief relies on multiple data sources to understand the number of hospitals, ICU beds, and the critical care workforce. Numbers cited here may differ from those reported in other publications because of variation in definitions, sources, and time frames.

• The workforce data is from state sources, the Arizona Medical Board (2019) and the Arizona Nursing Board (2020). Physicians who reported their first Area of Interest (AOI) as critical care followed by a second AOI of emergency medicine, pulmonary medicine, internal medicine etc. were included. The critical care nurse workforce represented in this brief includes Advanced Practice Registered Nurses (APRN) with critical or acute care specialty and APRN-CRNAs (Certified Registered Nurse Anesthetist).

• The data for respiratory therapists is from a federal source, the National Plan and Provider Enumeration System (NPPES) (2020). Respiratory therapists were identified using the NPPES taxonomies of registered or certified respiratory therapists.

• The hospital facility data is from the ADHS Uniform Accounting Reports (UAR) (2018), it is important to know that this data does not include data from federal or tribal facilities so may represent an undercount.

• County population data is from the U.S. Census, American Community Survey (2019). Counties are grouped according to their National Center for Health Statistics urban-rural classification for counties. We make two changes we group Pima county with the large size counties and Pinal county with the medium size counties. Large indicates the large central metro and medium metro counties (NHSC = 1,3); Medium indicates the small metro counties (NHSC=4) and the large fringe metro county, and small indicates the large and small rural counties (NHSC = 5,6).

<table>
<thead>
<tr>
<th>County Name</th>
<th>NCHSURC</th>
<th>NCHSURC Code Description</th>
<th>Designation in Brief</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>6</td>
<td>Non-Core (small rural)</td>
<td>Small</td>
</tr>
<tr>
<td>Cochise</td>
<td>4</td>
<td>Small metro</td>
<td>Medium</td>
</tr>
<tr>
<td>Coconino</td>
<td>4</td>
<td>Small metro</td>
<td>Medium</td>
</tr>
<tr>
<td>Gila</td>
<td>5</td>
<td>Micropolitan (large rural)</td>
<td>Small</td>
</tr>
<tr>
<td>Graham</td>
<td>5</td>
<td>Micropolitan (large rural)</td>
<td>Small</td>
</tr>
<tr>
<td>Greenlee</td>
<td>6</td>
<td>Non-Core (small rural)</td>
<td>Small</td>
</tr>
<tr>
<td>La Paz</td>
<td>6</td>
<td>Non-Core (small rural)</td>
<td>Small</td>
</tr>
<tr>
<td>Maricopa</td>
<td>1</td>
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<td>Large</td>
</tr>
<tr>
<td>Mohave</td>
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<td>Medium</td>
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<tr>
<td>Navajo</td>
<td>5</td>
<td>Micropolitan (large rural)</td>
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</tr>
<tr>
<td>Pima</td>
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</tr>
<tr>
<td>Pinal</td>
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</tr>
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<td>Santa Cruz</td>
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<td>Micropolitan (large rural)</td>
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</tr>
<tr>
<td>Yavapai</td>
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<td>Yuma</td>
<td>4</td>
<td>Small metro</td>
<td>Medium</td>
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</table>

References


