Policy Paper

Alabama Primary Care Service Areas

Produced by the Office for Family Health Education & Research, UAB School of Medicine

This document is a key and guide for the interactive maps and tables found at arha.online/PCSAWeb

Each map in this document is illustrative and includes instructions on how to use the interactive features. We recommend printing the document as a guide or displaying it side-by-side with the interactive maps.

Aim and Purpose

- To create primary care rational service areas (PCSA) for Alabama that are both descriptive and normative, based on spatial accessibility and which meet federal criteria for HRSA Rational Service Areas (RSA).
- To establish an Alabama statewide network of federally defined PCSAs that serve as geographic units wherein defined populations of Alabama residents have access to primary care physicians at a functional geographic level (spatial accessibility).

Background

The creation of an Alabama statewide network of PCSAs by the Office for Family Health, Education and Research (OFHER) is in response to a call in the 1998 Federal Register for states to develop statewide rational service areas.[1] *Federal* intent for using RSAs instead of geographic boundaries of a political subdivision, such as counties, to define Health Professions Shortage Areas (HPSAs) was first presented in the U.S. Public Health Service Act of 1974, Section 332. [254e](a)(1), *"for purposes of this subpart the term health professional shortage area means an area in an urban or rural area (which need conform to the geographic boundaries of a political subdivision and which is a rational service area of the delivery of health services)".* From 1974 to 2000, multiple reports and publications focused on criteria for creating rational service areas for primary care physician HPSAs. In 2000 the Division of Shortage Designation, Bureau of Primary Health Care Health Resources and Services Administration published a report of six states' (Arizona, California, Maine, Minnesota, Montana and Washington) methods, approaches and rationale used to establish RSAs for primary care (PCSA).

Using RSAs instead of counties, ZIP codes, cities and/or Rural-Urban Commuting Codes (RUCA) leads to databases based on non-restricted, non-artificial, but geographically limited populations with identifiable demographics. RSAs allow the ability to measure the healthcare needs of populations in geographical areas in terms of accessible resources and assets.

In this report, a PCSA is defined as a relatively self-continued geographic unit that reflects utilization patterns for primary care. More simply stated, a PCSA is an area within which most residents could or do seek and obtain most of their primary care. Between 2011 and 2016, multiple reports and articles have confirmed that PCSA populations do access primary care within their PCSA catchment areas.

We reviewed federal publications, published articles and reviewed in detail the 2000 Bureau of Primary Health Care Report. Seven criteria for PCSAs were universally noted:

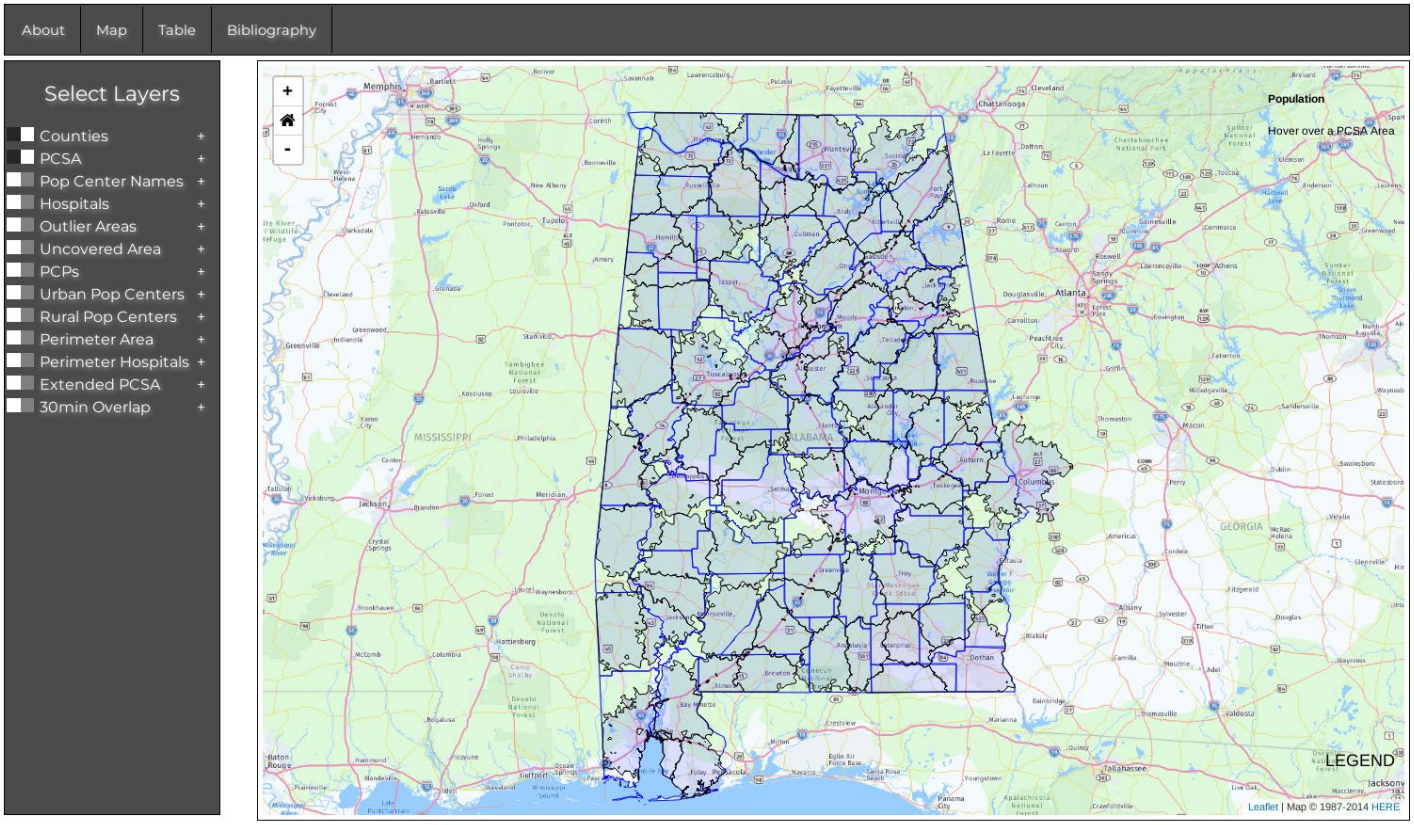
1. Have a population center in each PCSA with a defined service area access of 30 minutes or less drive time
2. Account for existing primary care physicians
3. Have hospital availability
4. Be able to identify the population and population demographics of the PCSA population
5. Consider historical relationships among communities
6. Consider non-medical service commuting and shopping patterns
7. Be able to identify populations outside of the PCSA catchment areas

1. Recorded in the Federal Register Volume 63 September 1998 in the section Proposed Rules for Designation of Health Professional Shortage Areas (HPSA) and Medically Underserved Areas and Populations (MUA/P).

Confirmation that that Alabama's PCSAs meet the standard for HRSA Primary Care Rational Service Areas

Based on HRSA's definition of a PCSA and using these seven criteria as guidelines, we identified 79 PCSAs in Alabama. These are shown in Figure 1 layered over an Alabama county map. Following is an analysis of our PCSA characteristics when compared to the requirements of each HRSA criterion.

Figure 1: Alabama map with counties and PCSAs



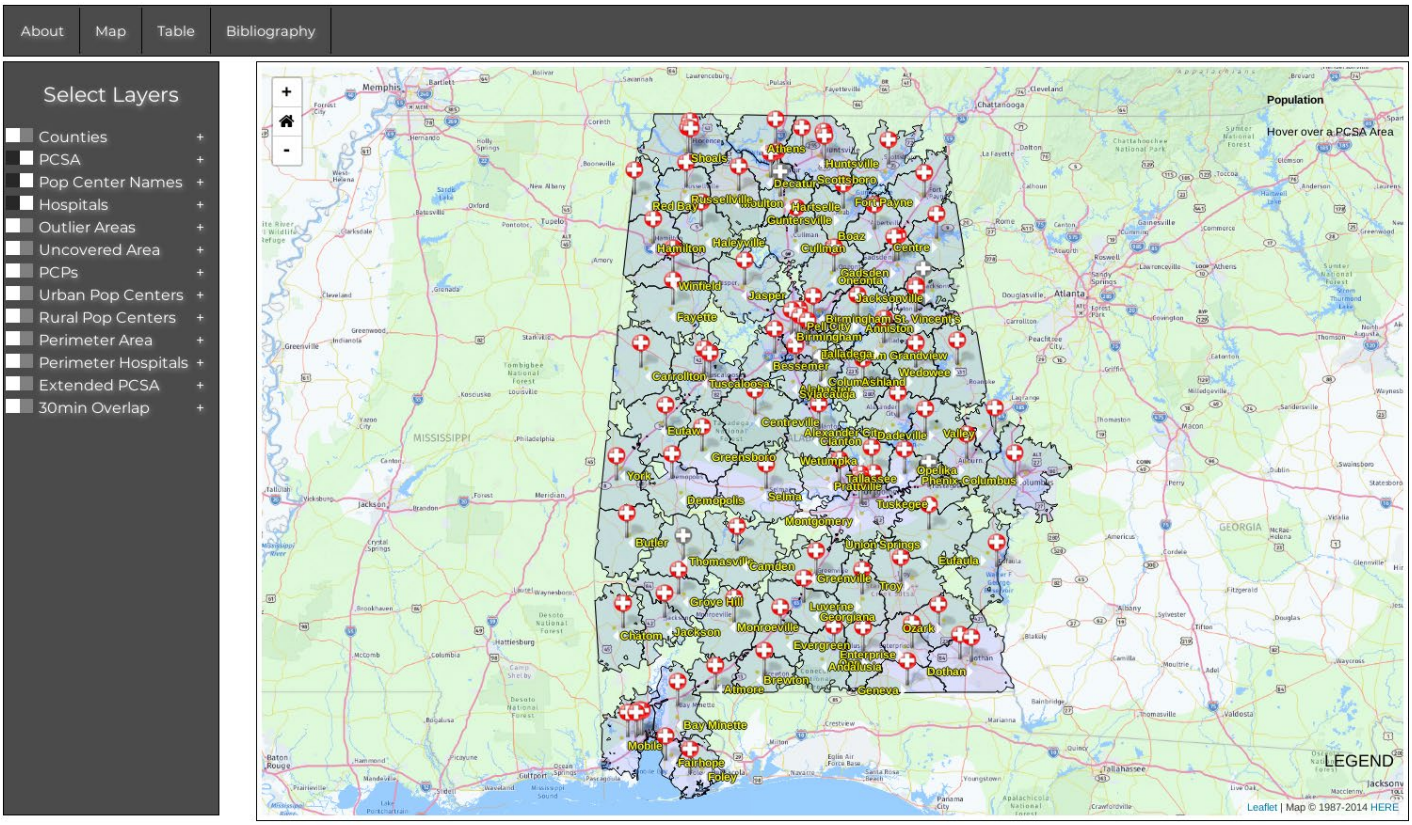
Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click the *county toggle*, click on the county to see country name and statistics; click on *PCSA toggle* to see the relationship of PCSAs to counties; click off *county toggle.* Explore a PCSA by clicking on a PCSA on the map. The map will center on the PCSA and open a data window; click the right upper x to close the window; click the home icon to return to map view.

Criterion 1: Have a population center in each PCSA with a defined service area access of 30 minutes or less drive time to that population center

Each of our PCSAs has a population center and a defined service area where the population in the catchment area has a 30-minute or less drive time from of each of its residents' home addresses to its population center. Figure 2 shows our PCSAs with each of their population centers identified. The city or town name is also the name of the PCSA.

NOTE: Where PCSA boundaries do not extend to a 30-minute travel time, the boundaries lie equidistance from that population center and all other associated population centers. Because a precise location is needed for travel time calculations, a centroid is created for each PCSA using the latitude and longitude determined location of a general admission hospital (GAH) or the designated town center. The location of a GAH (medical cross icon) or town center is the geographic point from which PCSA boundaries were constructed.

Figure 2: Alabama PCSA map showing PCSA population centers and GAHs (Medical cross icons.)

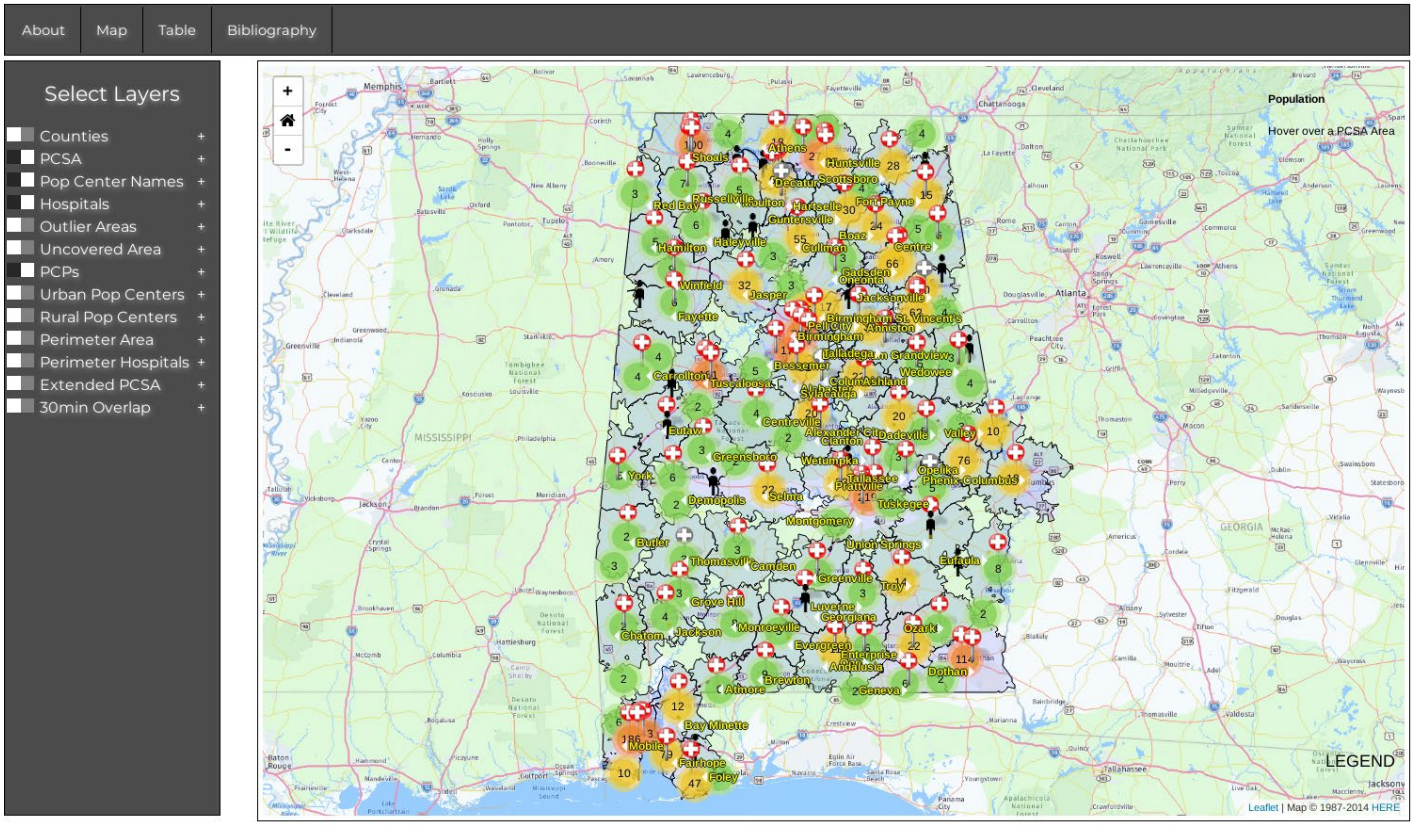


Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA, Population Centers, and Hospital toggles* use the home tab to enlarge the map for better visualization of relationships of population centers and GAHs. Click on a PCSA to see PCSA details.

Criterion 2: Account for existing PCPs

All primary care physicians[2] (PCPs) within each PCSA are accounted for using the latitude and longitude location of their practice sites. Figure 3 shows the distribution of Alabama's PCPs overlaid on an Alabama PCSA map. The locations of Alabama's GAHs are shown to emphasize that Alabama's PCPs cluster in population centers and around GAHs. Figure 3a is an enlarged snapshot of the Alabama PCSA map centered on the Selma PCSA to show relationships of population centers, hospitals and PCPs in more detail.

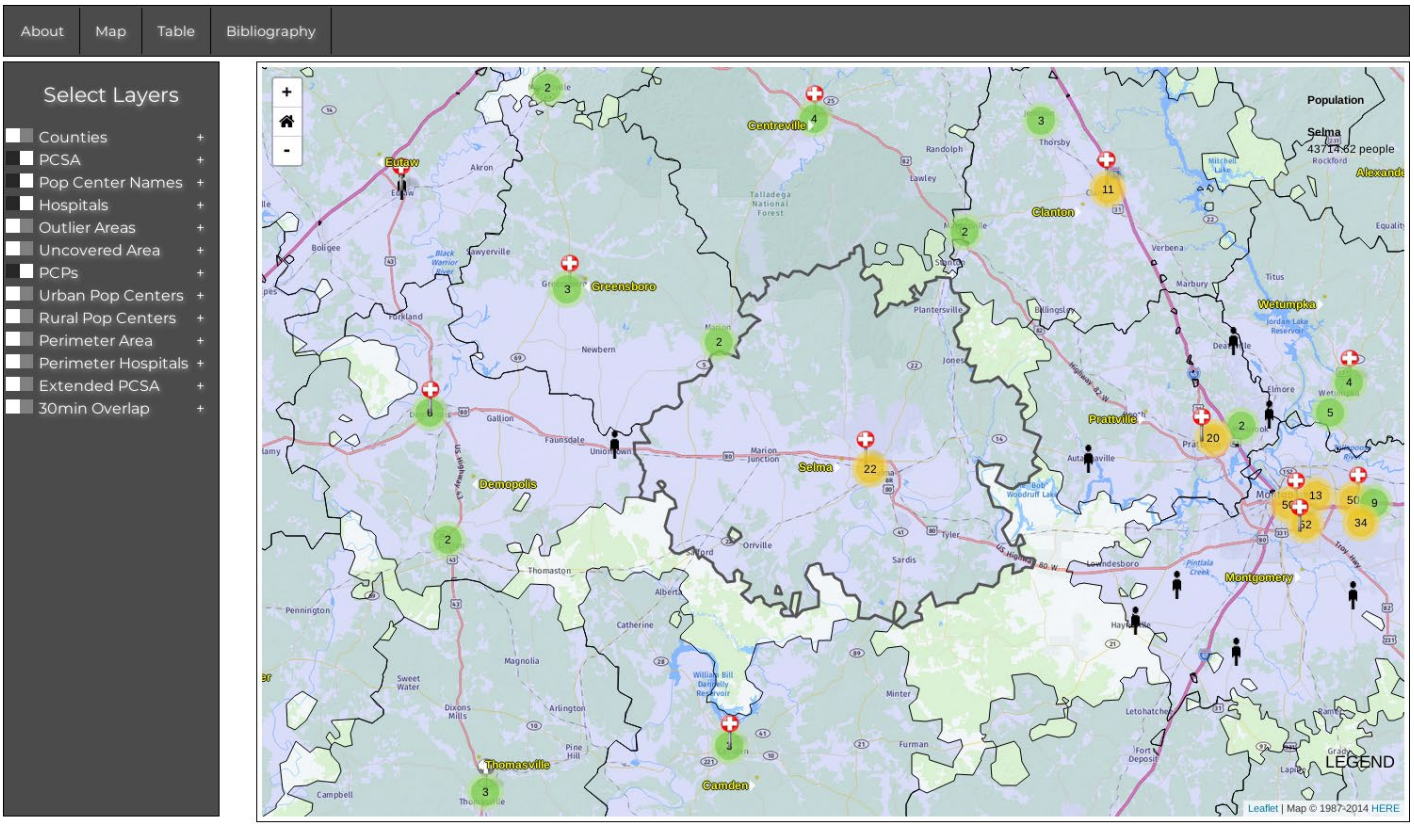
Figure 3: Alabama PCSA map showing the relationship of population centers, hospitals and PCPs.



Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA toggle*, click on the *PCP toggle*, click on *Hospitals toggle;* use the home toggle zoom function in on specific regions to see PCP distribution and relationship to hospitals, choose a PCSA and click on it. To see the PCP distribution within the PCSA, click on medical cross icon to see name of hospital. Click on person icon to see primary care specialty of the physician.

2. Alabama Department of Public Health defines Primary Care Physicians as family physicians, general internists, general pediatricians and med-peds physicians.

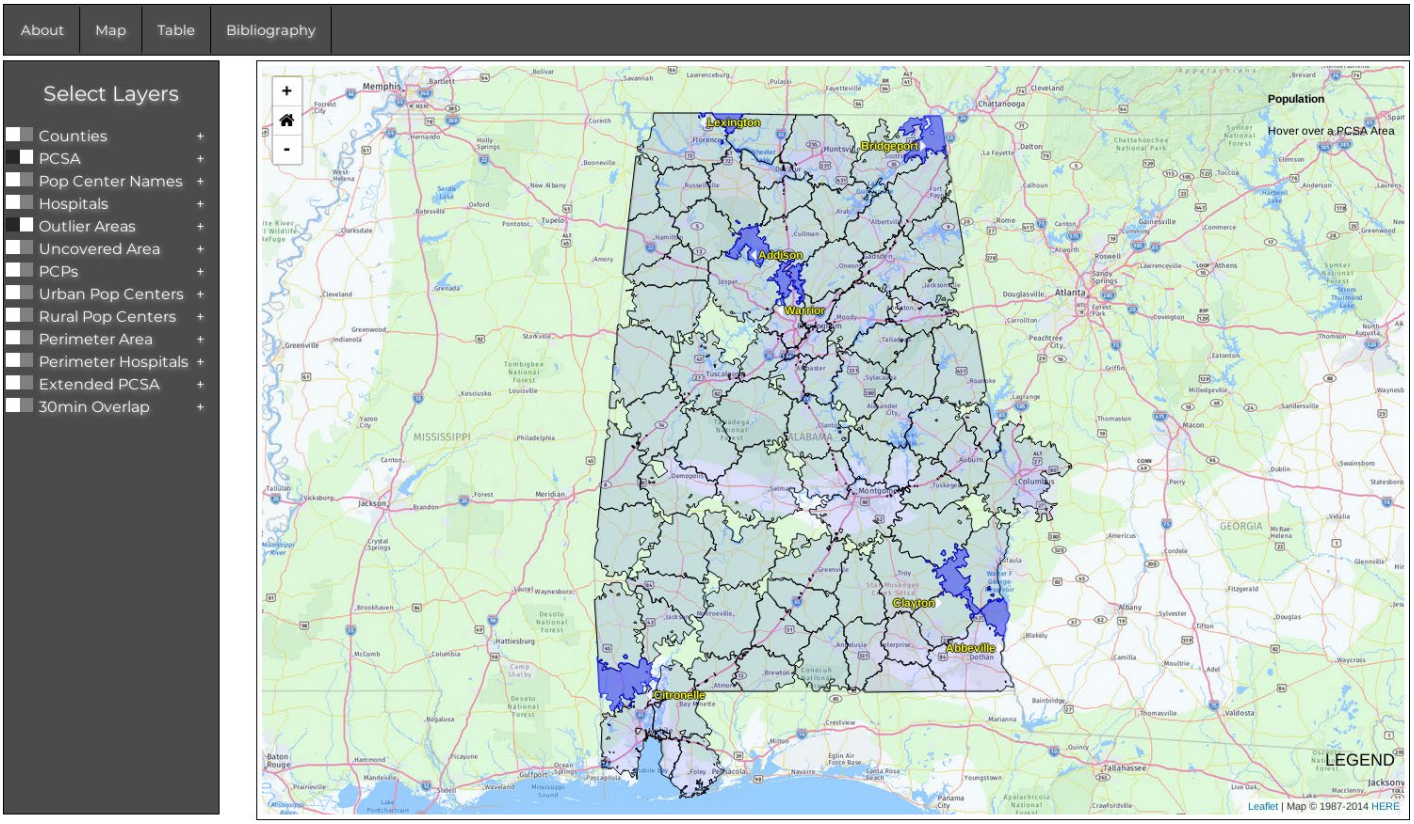
Figure 3a: Figure 3 zoomed in and centered on Selma to show details of local PCP distribution



Outlier PCSAs

Ten PCPs were identified at geographic locations outside the boundaries of our 79 PCSAs. These 10 PCPs were located in seven population centers. HRSA defines a PCSA as an area within which most residents could or do seek and obtain most of their primary care. The objective for the creation of rational service areas is to link health care resources to geographically accessible populations in a reasonable and rational way. In the case of our PCSAs, the goal is to rationally link defined populations with available PCPs. Thus, these 10 PCPs and their population centers were used to create an additional seven PCSAs where each PCSA boundary was either 30 minutes' drive time from a PCP(s) location or from the boundary of any of our existing 79 PCSAs. These seven PCSAs meet all the federal criteria for a PCSA except they do not have a GAH within their catchment area (Figure 4). The addition of these seven modified PCSAs brings our total Alabama PCSA network to 86.

Figure 4: Map of PCSAs and Outlier PCSAs



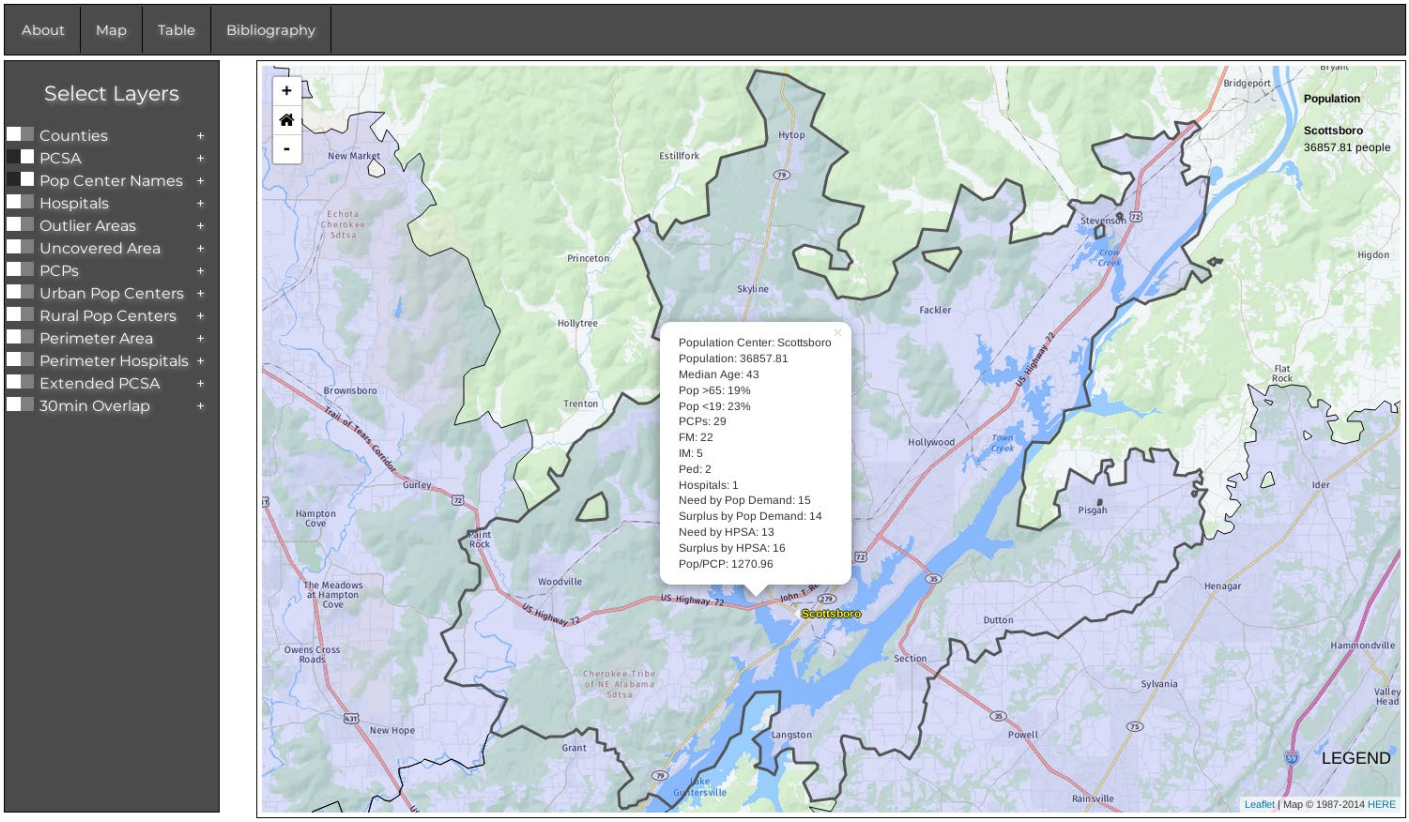
Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA toggle*, click on *Outlier Areas toggle*; click on a Outlier PCSA to see population center and PCSA population; click on the *PCP toggle* to see location of PCPs.

Criterion 3: Have hospital availability
Each of our PCSAs have general admission hospital availability, in fact, GAHs are located in all but five of our PCSA population centers, excluding our outlier PCSAs. (Figures 2 and 3).

Interactive presentation: Click *PCSA and hospitals toggles*.

Criterion 4: Be able to identify the population and population demographics of the PCSA population
Our GIS software program includes the complete National Census Bureau 2010 national census database, which is updated yearly. This allows identification of the number of individuals within each PCSA and each PCSA population demographics. Figure 5 shows the data window for the Scottsboro PCSA.

Figure 5: PCSA with open window



Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA toggle,* click on any *PCSA.* Note data window opens with click.

Criterion 5: Consider historical relationships among communities

We have considered historical relationships among communities by creating PCSA boundaries based on existing population centers, PCPs and hospitals. HRSA criteria require that the maximum travel time by local road system for a resident to access a primary care physician be no more than 30 minutes. Recognizing that many of our population centers (PCPs and general admission hospitals) are less than 30 minutes from other PCSA population centers, we created PCSA boundaries that are equidistance from all other population centers when the PCSA boundary was less than 30 minutes travel time between a population center and any other population center (Figure 4). We created modified outlier PCSAs in consideration of PCPs in population centers that were outside of our 30-minute boundaries of all other PCSAs (Figure 4).

Interactive presentation: Click *PCSA toggle*, *Population Centers toggle* and O*utlier toggle*; use zoom function to view details.

Criterion 6: Consider non-medical service commuting and shopping patterns

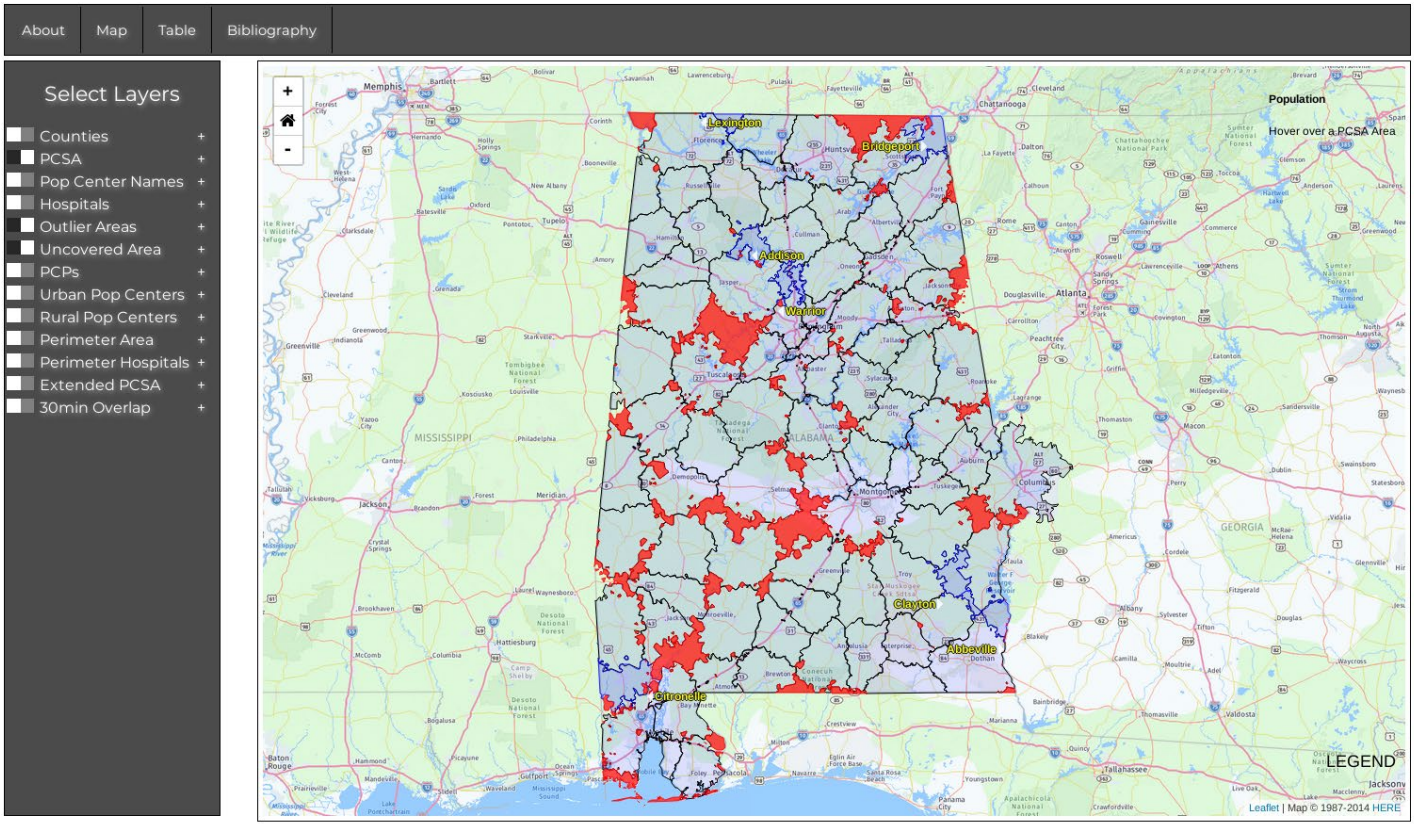
Mapping our PCSA population centers to an Alabama road map shows that they are also non-medical service commuting and shopping centers for their PCSA populations. Most are road network hubs and 70% are county seats (Figure 4).

Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA toggle*, use zoom function to view regional relationships and road networks; click on any PCSA and enlarge to see road system associated with the population center.

Criterion 7: Be able to identify populations outside of the PCSA catchment areas

The seventh federal criteria prompts a consideration of the PCSA network's ability to provide access for all of a state's residents. In the case that there are people outside of PCSAs, these populations and their locations should be identified. Figure 6 shows the areas within the state that are not covered by any PCSA catchment area. Our software was used to identify and record each individual within the catchment areas of our PCSAs, outlier PCSAs and in those geographic areas in the state that are not covered by PCSAs or outlier PCSAs (uncovered areas).

Figure 6: Alabama map showing PCSAs, outlier PCSAs and uncovered areas

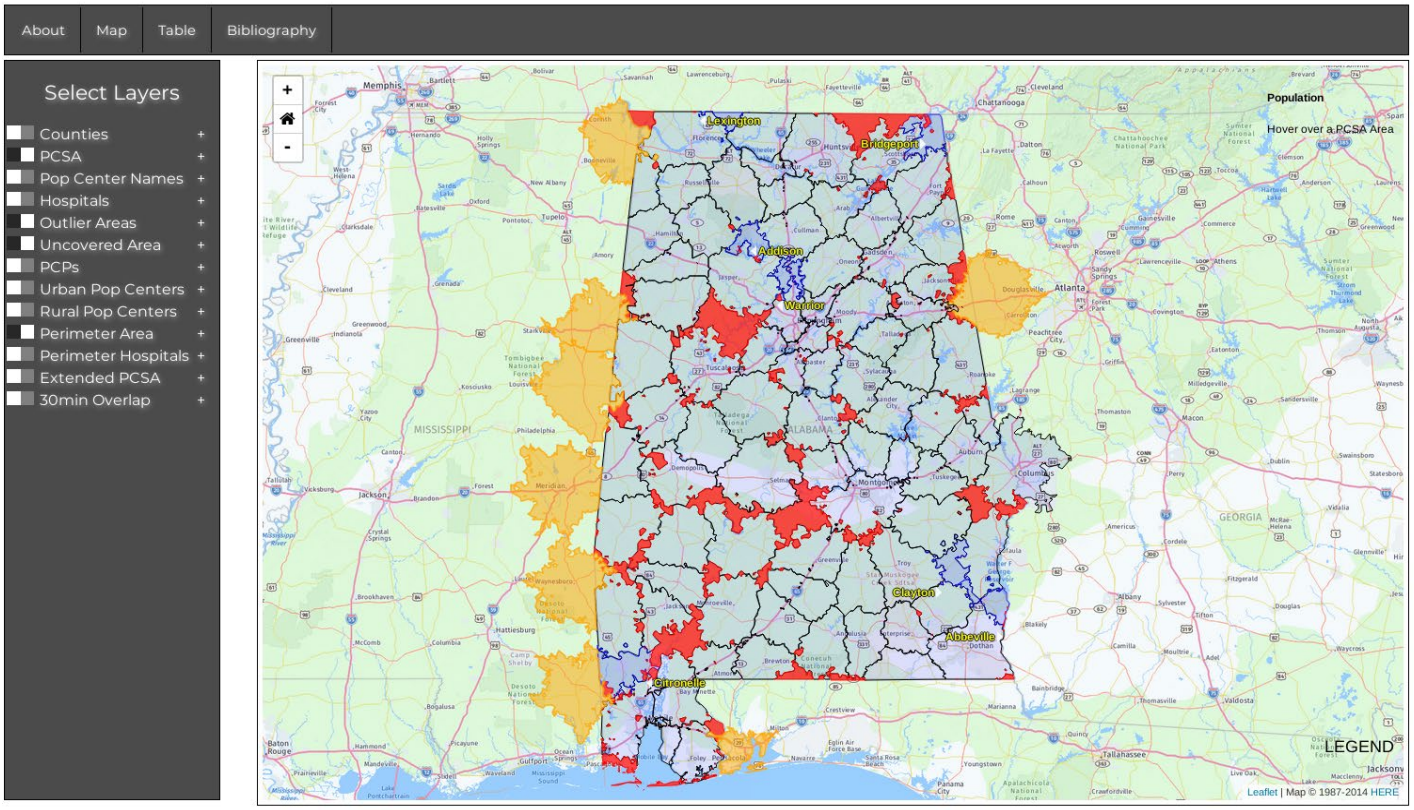


Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA toggle, Outlier toggle* and *Uncovered area toggle.*

Out-of-State PCSA Crossover

Since our PCSAs are based on spatial accessibility and are meant to be normative, they cross state and bordering state geo-political boundaries. Figure 7 shows the extent of out-of-state PCSAs on Alabama's uncovered areas that border with adjoining states. Thus, Alabama residents' access to PCPs located in border state PCSAs must be considered for Alabama residents that reside outside of Alabama's PCSA catchment areas. Figure 7 shows that the geographic area is minimal. Only 10,687 Alabama residents located in our network uncovered areas have access to out of state PCPs.

Figure 7: Alabama PCSA map showing out of state PCSAs that offer access to residents in Alabama's uncovered areas



Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on the *PCSA toggle, Outlier toggle, Uncovered toggle,* and *Perimeter toggle.*

We've calculated that 96.0% (4,660,025/4,853,657) of Alabama residents reside in one of our PCSAs. An additional 69,866 (1.4%) are located in outlier PCSAs. Only 0.2% (10,687) are in border-uncovered areas, and they all have 30-minute access to population centers, PCPs and hospitals that are located outside of the state of Alabama (Table 1). Thus, there are 113,079 (2.3%) residents spread among the geographically dispersed areas shown in figure 6 who do not have 30-minute access to a PCP(s). Combining our PCSA network with perimeter PCSAs, 97.7% of Alabama's residents have 30 minute or less access to PCPs (Table 1).

Table 1:

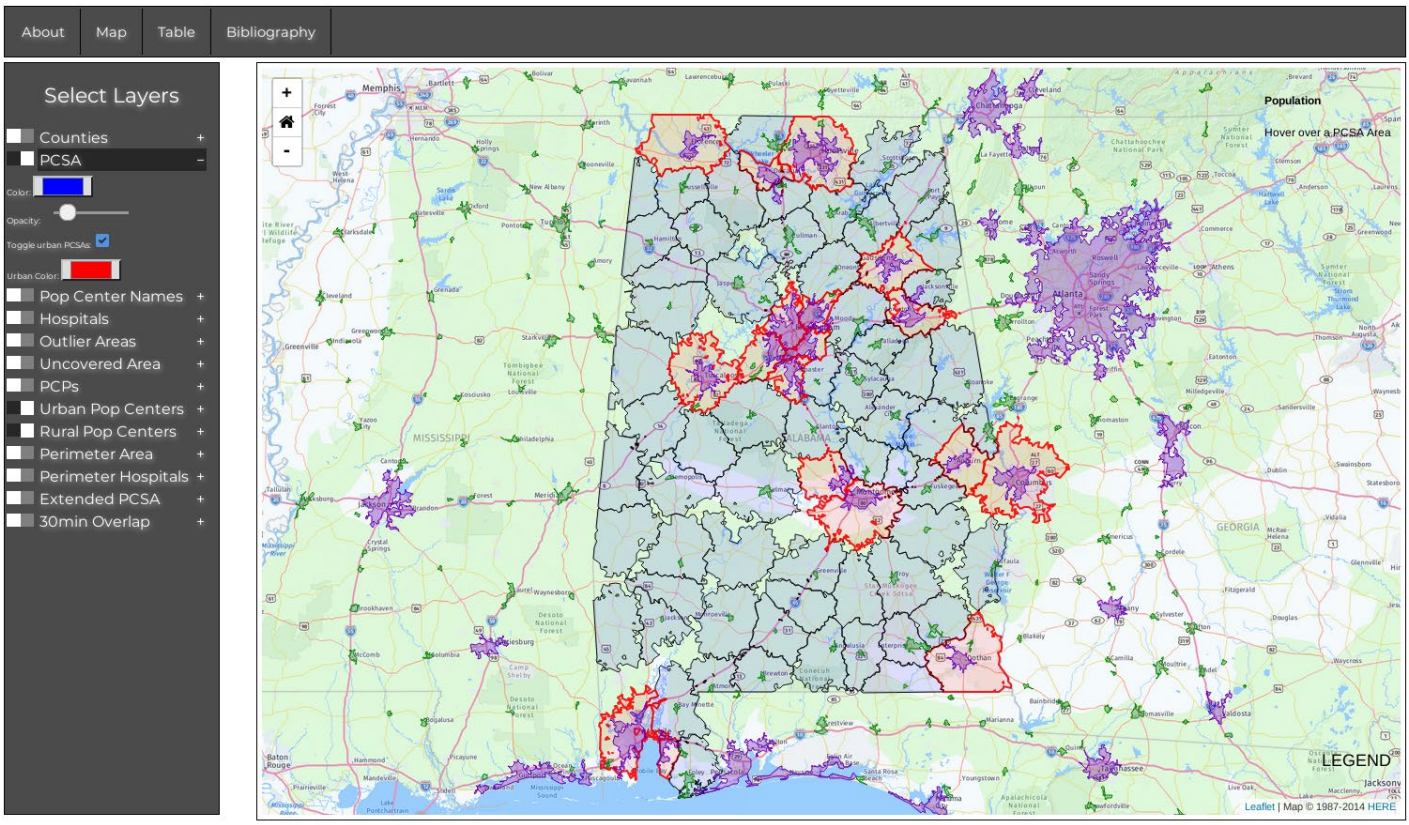
PCSA Network Coverage

	Population	*Ratio*
PCSA Type		
Alabama	4,853,657	*100.0%*
Standard PCSA	4,660,025	*96.0%*
Outlier PCSA	69,866	*1.4%*
Perimeter PCSA	10,687	*0.2%*
Uncovered	113,079	*2.3%*
Total Coverage		
PCSA	4,660,025	*96.0%*
PCSA+Outlier	4,729,891	*97.5%*
PCSA+Outlier+Perimeter	4,740,578	*97.7%*

Rural vs. Urban PCSAs

Our PCSA statewide network was created without consideration of rural or urban designations. Historically health statistics, outcomes, resources, populations, health status and health care shortages have been described as being urban or rural. Because of the broad and historical acceptance of presenting information as rural/urban, we have included map layers that designate our PCSAs as rural or urban (Figure 8). Our rural/urban designations are Alabama specific and are modifications based on the National Census Bureau urban-centric concept. Our PCSAs are designated as urban if their population centers are within a National Census Bureau Alabama urbanized area and rural if their population center is not within one of Alabama's urbanized areas or if it is a rational service point for a rural population. Population centers that are within the National Census Bureau urban clusters are designated as rural population centers if they serve National Census Bureau Rural territory populations.

Figure 8: Alabama map showing Alabama urbanized areas, Urbanized PCSAs and Rural PCSAs



Interactive presentation: Open arha.online/PCSAWeb and choose *MAP* in the tool bar. Click on *PCSA toggle,* click on *Plus symbol* (+) and click on *urban PCSAs* check box, click on *Urban population Centers toggle,* and *Rural Population Centers toggle.*

How to Use Table in the Interactive Interface: Open arha.online/PCSAWeb and choose Table. See interactive table. To review PCSA map data in table form click check box *Hospitals, Population, 0-19, 20+, Ped, IM, FM, PCP and Pop/PCP.* This table summarizes the population age demographics and PCP distribution information for each of the standard and outlier PCSAs shown in the individual PCSA map data windows. The PCSAs are in alphabetical order (A to Z). Review interactive instructions for sorting (ascending vs. descending data presentation) and filtering the data. Click check box Rural to designate PCSAs as rural. urban.

Conclusions

The static maps in this presentation and our linked interactive presentations confirm that our PCSA state network satisfies the standard set by HRSA for establishing a state PCSA network.

Using PCSAs instead of counties, ZIP codes, cities and/or RUCA codes leads to databases based on non-restricted, non-artificial, but geographically limited populations with identifiable demographics. PCSAs identify and measure the primary care needs of populations in geographical areas in terms of accessible healthcare resources and assets. In our case, Alabama PCSAs measure a defined population's accessibility to designated population centers where PCPs and GAHs are located and to estimate local PCP shortages or oversupply.

Our PCSA rural/urban designations are Alabama specific and are modifications based on the National Census Bureau urban-centric concept.

Alabama's PCSAs, when used to define Health Professions Shortage areas, produce accurate data for linking PCP availability to population demand, HIPSA standard or PCP population ratio. Using PCSAs is a functional alternative to designating partial counties as rural or urban. It eliminates the necessity of trying to determine the rurality of a political subdivision.

The use of PCSAs provides a foundation from which to build on our current primary care coverage and to pursue more in-depth analysis of workforce issues and barriers to primary care access. This model gives definition and focus for developing public and private partnerships, rural public policy, legislative support, pilot projects and rural outcomes research.

RSAs allow the ability to measure the healthcare needs of populations in geographical areas in terms of health care accessible resources and assets in areas other than primary care.

Strategies

Strategy 1: Use Alabama Primary Care Rational Service Areas as the geographic unit for documenting primary care physician distribution, workforce analysis and projections.

Strategy 2: Use the population centers of Alabama's Primary Care Rational Service Areas as centroids for health care services.

Strategy 3: Use Alabama Primary Care Rational Service Areas as the geographic unit for documentation and analysis for the delivery of health care services.