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# Congestive Heart Failure

*A Rural Veterans Health Care Atlas Series*

*1st edition FY-2014*



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## OVERVIEW

The staff at the GeoSpatial Outcomes Division accessed data repositories available through the VHA Support Service Center (VSSC) <http://vssc.med.va.gov/> to query and extract the data used to generate this chapter's tables, charts, and maps. The Diagnosis Cube, in particular, is a single repository cube with tools for diagnosis monitoring of the Veteran patient population.<sup>1</sup>

Subject matter experts and clinicians in the North Florida/South Georgia Veterans Health Care System were consulted to help the GSOD staff identify common causes of disabilities and health conditions that are associated with rehabilitation. Some of the causes identified were conditions related to heart disease and particularly Congestive Heart Failure. This represents a need for analysis of health care access and delivery for the Congestive Heart Failure cohort living in rural and highly rural areas. The GSOD team utilized scholarly and reliable web resources to confirm the 25 Diagnosis ICD-9-CM codes used to identify patients with Congestive Heart Failure (see *Diagnostic Codes Used to Define Cohort* section below).\*\*\* The team then extracted the appropriate data.

## Process of Data Compilation

Using the VSSC and Proclarity Desktop Professional Version 6.3.129.200, data were extracted from the Diagnosis Cube. **Prevalence and demographic data** were queried on a broad level and then drilled down to specific ruralities. The following parameters were entered in different combinations to present various scenarios:

- **Measures:** Unique Patients
- **DXDate Date:** FY-2014
- **Diagnosis ICD9 Desc:** All, 398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9
- **Home County VISN:** V01, V02, V03, V04, V05, V06, V07, V08, V09, V10, V11, V12, V15, V16, V17, V18, V19, V20, V21, V22, V23
- **DiagnosisPosition:** Primary Diagnosis, Secondary Diagnosis
- **Priority:** 1 Svc Con 50% +, 2 Svc Con 30%-40%, 3 Svc Con 20%/POW/Special, 5 Non Service Con Below Income

# Congestive Heart Failure



- **Rurality:** Highly Rural, Rural, Urban, Unknown
- **Gender:** Female, Male, Unknown
- **Age:** <25, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+, Unknown

Then the following parameters were entered to extract **outpatient encounters** and were used in different combinations to present various scenarios:

- **Measures:** Frequency
- **DXDate Date:** FY 14
- **Diagnosis ICD9 Desc:** All, 398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9
- **Home County VISN:** V01, V02, V03, V04, V05, V06, V07, V08, V09, V10, V11, V12, V15, V16, V17, V18, V19, V20, V21, V22, V23
- **DiagnosisPosition:** Primary Diagnosis, Secondary Diagnosis
- **Rurality:** Highly Rural, Rural, Urban, Unknown
- **Source:** Outpatient Encounters

ESRI ArcGIS Desktop was used to import the tabular data and create custom maps at National and VISN scales. The tabular data is broken down by rows of FIPS codes (county level geographic units), State, VISN, and then by columns of the following:

- Count of total number of patients with Congestive Heart Failure in the VHA.
- Counts and percentages of patients with Congestive Heart Failure versus all patients (uniques) broken down by rurality (HR/R/U/total), with HR/R combined into RHR for the purposes of patient confidentiality
- Counts and percentages of patients with Congestive Heart Failure versus all patients (uniques) *by gender* broken down by rurality (HR/R/U/total), with HR/R combined into RHR for the purposes of patient confidentiality
- Counts and percentages of patients with Congestive Heart Failure versus all patients (uniques) *by age group* (<65, 65+) broken down by rurality (HR/R/U/total), with HR/R combined into RHR for the purposes of patient confidentiality

- Counts and percentages of patients with Congestive Heart Failure versus all patients (uniques) *by enrollment priority (groups 1, 2 and 3)* broken down by rurality (HR/R/U/total), with HR/R combined into RHR for the purposes of patient confidentiality
- Counts and percentages of patients with Congestive Heart Failure versus all patients (uniques) *by enrollment priority (group 5)* broken down by rurality (HR/R/U/total), with HR/R combined into RHR for the purposes of patient confidentiality
- Counts and percentages of outpatient encounters of patients with Congestive Heart Failure in rural and highly rural areas versus outpatient encounters of patients with Congestive Heart Failure in all rural categories, with HR/R combined into RHR for the purposes of patient confidentiality.

\*\*\*GSOD would like to thank Dr. Charles Levy and Keith Myers in the North Florida/South Georgia Veterans Health System for consulting with the team to identify the appropriate diagnosis codes to produce this chapter. GSOD would also like to acknowledge The Dartmouth Institute for Health Policy and Clinical Practice for producing the The Dartmouth Atlas of Health Care which collected the ICD-9 codes used for Congestive Heart Failure. The qualifying diagnosis codes are available here: [http://www.dartmouthatlas.org/downloads/methods/Chronic\\_Disease\\_Codes.pdf](http://www.dartmouthatlas.org/downloads/methods/Chronic_Disease_Codes.pdf) and the research methods used in production of that atlas are available here: [http://www.dartmouthatlas.org/downloads/methods/research\\_methods.pdf](http://www.dartmouthatlas.org/downloads/methods/research_methods.pdf)

## Diagnostic Codes Used to Define Cohort (Congestive Heart Failure)

ICD-9 CM code	Description
398.91	RHEUMATIC HEART FAILURE (CONGESTIVE)
402.01	MALIGNANT HYPERTENSIVE HEART DISEASE WITH CHF
402.11	BENIGN HYPERTENSIVE HEART DISEASE WITH CHF
402.91	UNSPECIFIED HYPERTENSIVE HEART DISEASE WITH CHF
404.01	MALIGNANT HYPERTENSIVE HEART AND RENAL DISEASE WITH CHF
404.03	MALIGNANT HYPERTENSIVE HEART AND RENAL DISEASE WITH CHF +RENAL FAILURE
404.11	BENIGN HYPERTENSIVE HEART AND RENAL DISEASE WITH CHF
404.13	BENIGN HYPERTENSIVE HEART AND RENAL DISEASE WITH CHF AND RENAL FAILURE
404.91	UNSPECIFIED HYPERTENSIVE HEART AND RENAL DISEASE WITH CHF
404.93	UNSPECIFIED HYPERTENSIVE HEART AND RENAL DISEASE WITH CHF AND RENAL FAILURE
428.0	CONGESTIVE HEART FAILURE, UNSPECIFIED
428.1	LEFT HEART FAILURE
428.20	SYSTOLIC HEART FAILURE, UNSPECIFIED
428.21	SYSTOLIC HEART FAILURE, ACUTE
428.22	SYSTOLIC HEART FAILURE, CHRONIC
428.23	SYSTOLIC HEART FAILURE, ACUTE ON CHRONIC
428.30	DIASTOLIC HEART FAILURE, UNSPECIFIED
428.31	DIASTOLIC HEART FAILURE, ACUTE
428.32	DIASTOLIC HEART FAILURE, CHRONIC
428.33	DIASTOLIC HEART FAILURE, ACUTE ON CHRONIC
428.40	COMBINED SYSTOLIC AND DIASTOLIC HEART FAILURE, UNSPECIFIED
428.41	COMBINED SYSTOLIC AND DIASTOLIC HEART FAILURE, ACUTE
428.42	COMBINED SYSTOLIC AND DIASTOLIC HEART FAILURE, CHRONIC
428.43	COMBINED SYSTOLIC AND DIASTOLIC HEART FAILURE, ACUTE ON CHRONIC
428.9	HEART FAILURE, UNSPECIFIED

## **Organization of Data Tables and Maps**

The data tables and maps for Veterans with Congestive Heart Failure are organized into four sections. The first section (Section I) focuses on the total numbers of VHA patients with Congestive Heart Failure. We first present an overview of the data at the National, Veterans Integrated Service Network (VISN), State, and county levels. In addition to the overall number of patients with Congestive Heart Failure, data are presented by gender, age group, and enrollment status. Table 1 contains the data used in the narrative summary. Following the table, there are a series of maps that visually illustrate the data.

- Map 1: Number of Patients with Congestive Heart Failure by VISN, FY-2014
- Map 2: Number of Patients with Congestive Heart Failure by State, FY-2014
- Map 3: Number of Patients with Congestive Heart Failure by County, FY-2014
- Map 4 - 7: Number of Patients with Congestive Heart Failure by County, FY-2014 – Zoomed VISN views

Section II of the chapter focuses on the overall prevalence of Congestive Heart Failure by the following rurality categories: *highly rural, rural, urban, and unknown*. Since the *rural and highly rural* categories are of particular interest in this volume, numbers and percentages are distinctively highlighted in shades of blue in Table 2. National, VISN, State, and county overview are presented focusing on the rural and highly rural Veterans with Congestive Heart Failure. Because the number of highly rural Veterans is so small, we combined the data for mapping purposes. For the maps, urban areas are shaded and urban patients are removed from the numerator and denominator. The following maps illustrate graphically the data on rural and highly rural patients with Congestive Heart Failure:

- Map 8: Number of Rural and Highly Rural Patients with Congestive Heart Failure by VISN, FY-2014
- Map 9: Percent of Rural and Highly Rural Patients with Congestive Heart Failure of Total Rural and Highly Rural Patients by VISN, FY-2014
- Map 10: Number of Rural and Highly Rural Patients with Congestive Heart Failure by State, FY-2014
- Map 11: Percent of Rural and Highly Rural Patients with Congestive Heart Failure of Total Rural and Highly Rural Patients by State, FY-2014
- Map 12: Number of Rural and Highly Rural Patients with Congestive Heart Failure by County, FY-2014
- Map 13: Percent of Rural and Highly Rural Patients with Congestive Heart Failure of Total Rural and Highly Rural

## Patients by County, FY-2014

- Maps 14, 16, 18, 20: Number of Rural and Highly Rural Patients with Congestive Heart Failure by County, FY-2014 – Zoomed VISN views
- Map 15, 17, 19, 21: Percent of Rural and Highly Rural Patients with Congestive Heart Failure by County, FY-2014 – Zoomed VISN views

Section III provides more detail on subgroups of rural and highly rural patients. Table 3 contains data broken down by gender and rurality, with accompanying maps of rural and highly rural VHA female patients:

- Map 22: Number of Rural and Highly Rural Female Patients with Congestive Heart Failure by VISN, FY-2014
- Map 23: Percent of Rural and Highly Rural Female Patients with Congestive Heart Failure of Total Rural and Highly Rural Female Patients by VISN, FY-2014
- Map 24: Number of Rural and Highly Rural Female Patients with Congestive Heart Failure by State, FY-2014
- Map 25: Percent of Rural and Highly Rural Female Patients with Congestive Heart Failure of Total Rural and Highly Rural Female Patients by State, FY-2014 \*\*\* **Note:** County level maps are not presented for this disease condition, as the number of VHA female patients with Congestive Heart Failure is very small.

Table 4 contains data broken down by age group and rurality, with accompanying maps of rural and highly rural VHA patients by 65 years of age and older:

- Map 26: Number of Rural and Highly Rural Patients Aged 65+ with Congestive Heart Failure by VISN, FY-2014
- Map 27: Percent of Rural and Highly Rural Patients with Congestive Heart Failure Aged 65+ of Total Rural and Highly Rural Patients Aged 65+ by VISN, FY-2014
- Map 28: Number of Rural and Highly Rural Patients Aged 65+ with Congestive Heart Failure by State, FY-2014
- Map 29: Percent of Rural and Highly Rural Patients Aged 65+ with Congestive Heart Failure of Total Rural and Highly Rural Patients Aged 65+ by State, FY-2014
- Map 30: Number of Rural and Highly Rural Patients Aged 65+ with Congestive Heart Failure by County, FY-2014
- Map 31: Percent of Rural and Highly Rural Patients Aged 65+ with Congestive Heart Failure of Total Rural and Highly Rural Patients Aged 65+ by County, FY-2014

Table 5 contains data broken down by enrollment priority and rurality, with accompanying maps of rural and highly rural VHA patients by Service Connection (Enrollment Priority Groups 1-3) and Low Income (Enrollment Priority Group 5):

- Map 32: Number of Rural and Highly Rural Patients in Priority Group 1-3 with Congestive Heart Failure by VISN, FY-2014
- Map 33: Percent of Rural and Highly Rural Patients with Congestive Heart Failure in Priority Group 1-3 of Total Rural and Highly Rural Patients in Priority Group 1-3 by VISN, FY-2014
- Map 34: Number of Rural and Highly Rural Patients in Priority Group 1-3 with Congestive Heart Failure by State, FY-2014
- Map 35: Percent of Rural and Highly Rural Patients in Priority Group 1-3 with Congestive Heart Failure of Total Rural and Highly Rural Patients in Priority Group 1-3 by State, FY-2014
- Map 36: Number of Rural and Highly Rural Patients in Priority Group 1-3 with Congestive Heart Failure by County, FY-2014
- Map 37: Percent of Rural and Highly Rural Patients in Priority Group 1-3 with Congestive Heart Failure of Total Rural and Highly Rural Patients in Priority Group 1-3 by County, FY-2014
- Map 38: Number of Rural and Highly Rural Patients in Priority Group 5 with Congestive Heart Failure by VISN, FY-2014
- Map 39: Percent of Rural and Highly Rural Patients with Congestive Heart Failure in Priority Group 5 of Total Rural and Highly Rural Patients in Priority Group 5 by VISN, FY-2014
- Map 40: Number of Rural and Highly Rural Patients in Priority Group 5 with Congestive Heart Failure by State, FY-2014
- Map 41: Percent of Rural and Highly Rural Patients in Priority Group 5 with Congestive Heart Failure of Total Rural and Highly Rural Patients in Priority Group 5 by State, FY-2014
- Map 42: Number of Rural and Highly Rural Patients in Priority Group 5 with Congestive Heart Failure by County, FY-2014
- Map 43: Percent of Rural and Highly Rural Patients in Priority Group 5 with Congestive Heart Failure of Total Rural and Highly Rural Patients in Priority Group 5 by County, FY-2014

The final section of the chapter (Section IV) provides information on the outpatient encounters of VHA patients with Congestive Heart Failure. Table 6 examines the outpatient encounters of patients with a **primary** diagnosis of Congestive Heart Failure and breaks the encounter information by rurality and Table 8 provides information on the number of outpatient encounters of patients with a **secondary** diagnosis of Congestive Heart Failure, also categorized by rurality. Table 7 and Table 9 provide information on the numbers and percentage of rural and highly rural Congestive Heart Failure encounters of total Congestive Heart Failure encounters for patients with a primary diagnosis of Congestive Heart Failure (Table 7) and secondary diagnosis of Congestive Heart Failure (Table 9). The accompanying maps display the total numbers and percentages of rural and highly rural patients with **either** a primary or secondary diagnosis of Congestive Heart Failure to capture the total workload (outpatient encounters) of this disease in rural and highly rural areas:

- Map 44: Number of Rural and Highly Rural Congestive Heart Failure Patient Encounters by VISN, FY-2014
- Map 45: Percent of Rural and Highly Rural Congestive Heart Failure Patient Encounters of VHA Congestive Heart Failure Patient Encounters by VISN, FY-2014
- Map 46: Number of Rural and Highly Rural Congestive Heart Failure Patient Encounters by State, FY-2014
- Map 47: Percent of Rural and Highly Rural Congestive Heart Failure Patient Encounters of VHA Congestive Heart Failure Patient Encounters by State, FY-2014
- Map 48: Number of Rural and Highly Rural Congestive Heart Failure Patient Encounters by County, FY-2014
- Map 49: Percent of Rural and Highly Rural Congestive Heart Failure Patient Encounters of VHA Congestive Heart Failure Patient Encounters by County, FY-2014

*Note:* An asterisk (\*) that appears in the tables signifies a low number or proportion of unique patients.

## Section I Highlights: VHA Patients with Congestive Heart Failure

### National Overview

In Fiscal Year 2014, the Veterans Health Administration had 226,727 patients with the diagnosis code indicating a primary or secondary diagnosis of Congestive Heart Failure (Table 1). This number represented approximately four percent (3.65%) of the total patient population during the fiscal year. As with most patients seen in the VHA, the majority of patients with Congestive Heart Failure were male (97.66%); however, females represented about two percent (2.34%). The age distribution of patients with Congestive Heart Failure shows that 0.75% were under the age of 45, 3.63% were ages 45-54, 18.09% were ages 55-64, 34.37% were ages 65-74, and 43.17% were ages 75 or older.

We examined two groups of Veterans by their Enrollment Priority. Enrollment Priority Groups 1-3 were combined into one group, which includes Service-Connected Veterans rated by the VA from 10-100%. A second group, Enrollment Priority Group 5, was selected to represent non Service-Connected and noncompensable Service-Connected Veterans rated 0% disabled by VA with annual income and/or net worth below the VA National income threshold and geographically-adjusted income threshold for their resident location.<sup>2</sup> The table shows that about half of patients with Congestive Heart Failure (43.54%) were Service-Connected injured Veterans enrolled in Priority Groups 1 – 3 and almost one-third (29.46%) were Priority 5 (low income).

### VISN Overview

At the time of this edition, the Veterans Health Administration consisted of 21 networks. Examining data at the network level, the volume of patients with Congestive Heart Failure ranged from a high of 20,571 individuals in the South Central Network (VISN 16, which serves Veterans in Oklahoma, Arkansas, Louisiana, Mississippi, and parts of Texas, Missouri, Alabama and Florida) to a low of 3,872 individuals in the Capitol Network (VISN 5, which includes all of Washington D.C. and portions of Pennsylvania, Maryland, Virginia, and West Virginia). When examining the number of patients with Congestive Heart Failure proportionally to all patients, the Mid South Network (VISN 9) had the highest proportion at 4.56% and the Capitol Network (VISN 5) had the lowest proportion at 2.58%. The two VISNs with the highest ratio of females to males were in the Southwest Network (VISN 18), where 2.82% of the patients with Congestive Heart Failure

# Congestive Heart Failure



were female, followed closely by the Northwest Network (VISN 20) with 2.81%. Nationally, the 75+ age group had the highest prevalence of patients with Congestive Heart Failure to all VHA patients (43.17%); however, five networks had more than 50% of the VHA patient population in this age group diagnosed with Congestive Heart Failure, in rank order: VISNs 1, 23, 3, 2, and 4. Nine of the 21 VISNs had nearly 50% of patients with Congestive Heart Failure in the VHA enrolled as Service-Connected (Priority Groups 1-3), the Heart of Texas Network (VISN 17) leading at 49.91%. Map 1 shows the number of Veterans with Congestive Heart Failure by quartile across the 21 VISNs.

## State Overview

Map 2 shows the number of VHA patients with Congestive Heart Failure by State (by quartile). The top 10 States with the highest number of patients with Congestive Heart Failure by rank order were Texas (N=18,164), California (N=15,957), Florida (N=15,651), Ohio (N=10,595), Pennsylvania (N=9,661), New York (N=9,367), Illinois (N=8,603), North Carolina (N=6,930), Georgia (N=6,551), and Tennessee (N=6,551). The State with the highest percentage of patients with Congestive Heart Failure was Kentucky (5.0%), followed by (in rank order): Oklahoma (4.95%), Arkansas (4.89%), Utah (4.89%), South Dakota (4.85%), Tennessee (4.76%), Ohio (4.68%), Louisiana (4.67%), Nebraska (4.66%) and Kansas (4.65%).

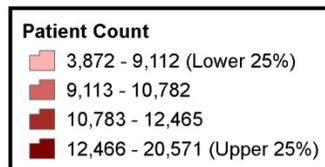
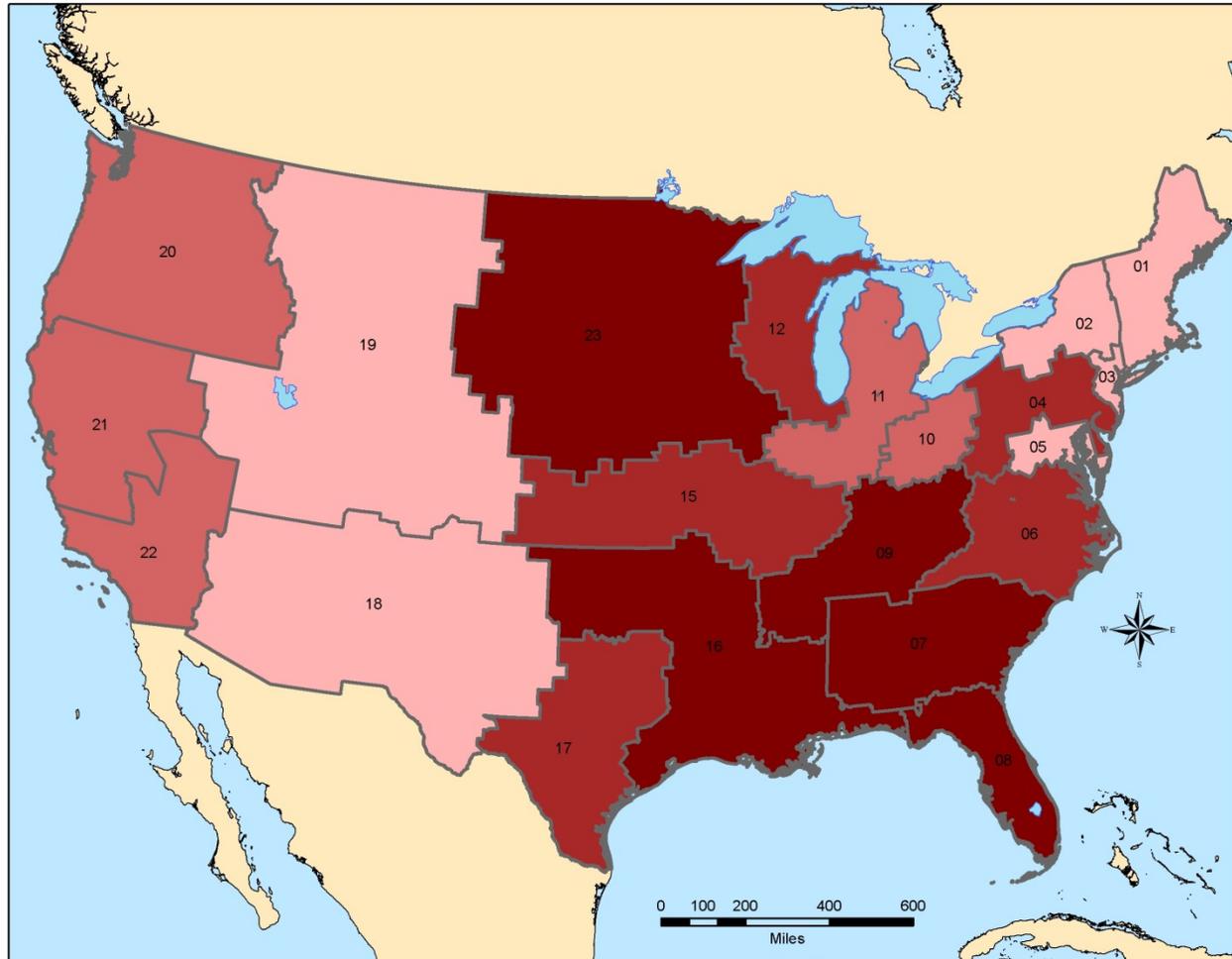
## County Overview

The number of patients with Congestive Heart Failure by county is displayed by quartiles in Map 3. The highest 25% in terms of volume is designated by the darkest color. In addition to the National map, four additional maps are provided that zoom to the VISN level (Maps 4-7) to give a clearer picture of the number of patients with Congestive Heart Failure and the geographic patterns within each VISN. The top 10 counties with the largest number of VHA patients with Congestive Heart Failure across the US were in the States of Illinois (1 county), California (3 counties), Texas (2 counties), Arizona (2 counties), Ohio (1 county), and Nevada (1 county). Cook County, Illinois has the largest number of patients with Congestive Heart Failure (N=3,076), followed by, in rank order: Los Angeles County, California (N=2,386), Harris County, Texas (N=2,210), Maricopa County, Arizona (N=2,122), San Diego County, California (N=1,842), Dallas County, Texas (N=1,836), Cuyahoga County, Ohio (N=1,544), Clark County, Nevada (N=1,406), Riverside County, California (N=1,295), and Pima County, Arizona (N=1,287).

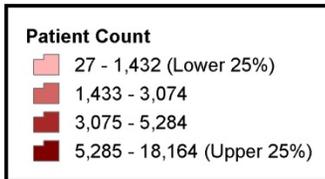
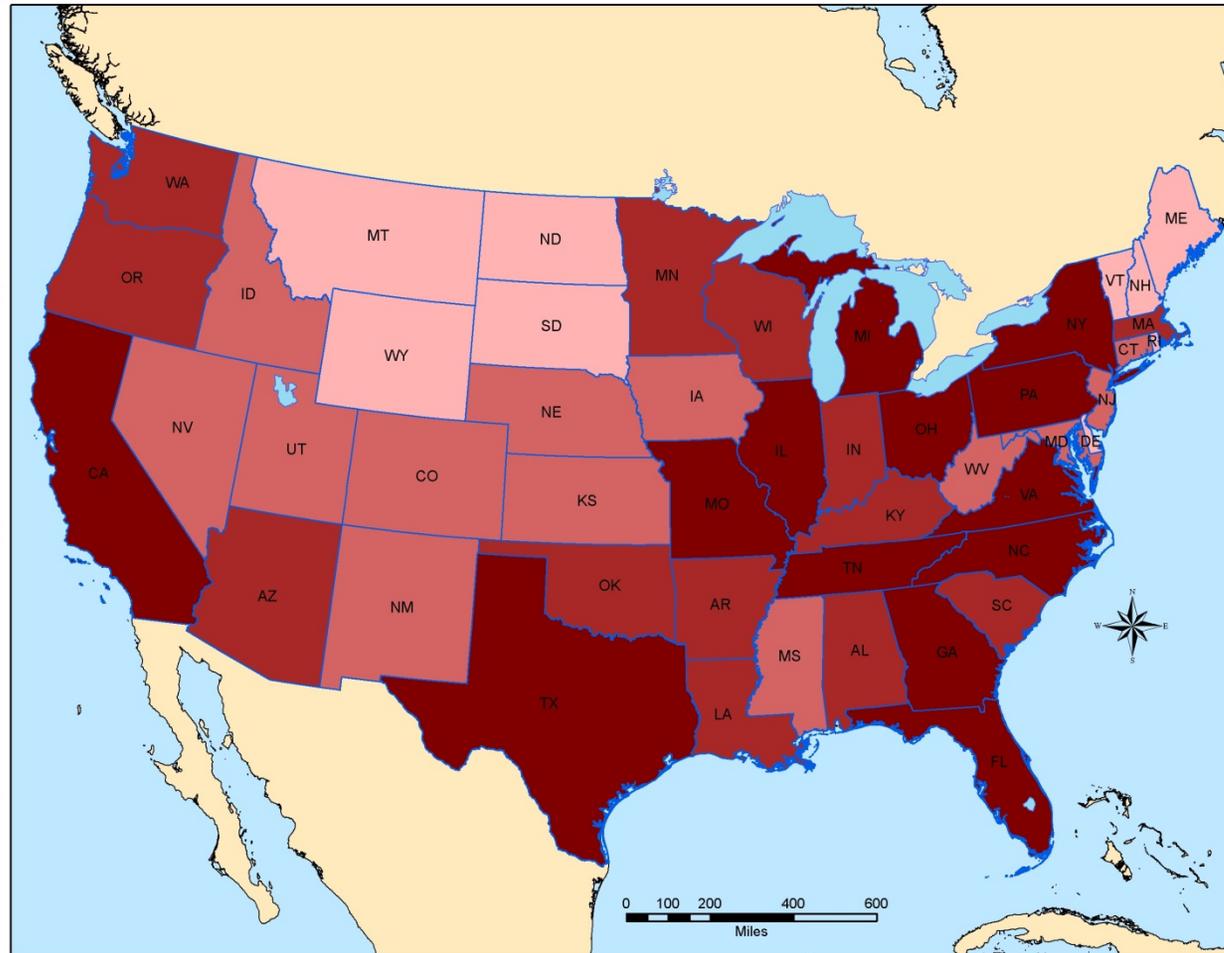
Table 1: National and VISN Numbers and Percentages of VHA Patients with Congestive Heart Failure, FY-2014

Overall Prevalence Statistics- Congestive Heart Failure, FY-2014												
Veterans Integrated Service Network	Total Number of Patients	Patients with Congestive Heart Failure		Gender (%)		Age Group (%)					Enrollment Priority Groups (%)	
		N	(%)	F	M	<45	45-54	55-64	65-74	75+	Service Connected (Priority 1-3)	Low Income (Priority 5)
New England (01)	253,326	8,437	3.33	2.32	97.68	0.45	2.10	11.14	28.87	57.44	44.10	25.53
Upstate NY (02)	136,497	4,862	3.56	2.67	97.33	0.58	2.69	13.53	29.51	53.70	36.90	31.82
NY/NJ (03)	174,457	5,797	3.32	1.57	98.43	0.38	3.26	13.83	26.82	55.70	36.85	30.72
Stars and Stripes (04)	310,940	12,217	3.93	1.98	98.02	0.42	2.45	13.59	31.45	52.10	35.39	29.02
Capitol (05)	150,012	3,872	2.58	2.69	97.31	1.27	4.78	19.65	31.22	43.10	38.04	35.85
Mid-Atlantic (06)	359,692	12,465	3.47	2.28	97.72	1.01	4.45	20.60	35.96	37.99	47.55	29.26
Southeast (07)	408,164	14,265	3.49	3.25	96.75	1.52	5.97	23.48	35.65	33.40	47.87	28.61
Sunshine (08)	576,411	18,013	3.13	2.39	97.61	0.59	3.60	16.65	31.80	47.40	41.64	30.11
Mid South (09)	298,396	13,614	4.56	2.40	97.60	0.82	4.37	20.49	37.10	37.26	45.32	30.95
Ohio (10)	231,319	10,129	4.38	2.10	97.90	0.52	3.96	19.56	36.47	39.50	37.77	33.24
Vets in Partnership (11)	282,135	10,782	3.82	2.20	97.80	0.73	4.11	18.75	37.32	39.10	42.34	31.38
Great Lakes (12)	266,879	10,996	4.12	1.99	98.01	0.60	3.26	15.88	33.09	47.17	34.61	30.00
Heartland (15)	245,357	11,055	4.51	1.92	98.08	0.41	3.10	19.29	34.53	42.70	40.97	30.44
South Central (16)	502,681	20,571	4.09	2.21	97.79	0.96	4.03	21.28	37.00	36.75	46.47	30.02
Heart of Texas (17)	306,581	11,063	3.61	2.74	97.26	1.43	4.47	22.23	38.02	33.85	49.91	27.58
Southwest (18)	271,557	9,112	3.36	2.82	97.18	0.67	2.94	17.34	35.90	43.16	45.40	30.07
Rocky Mtn. (19)	202,350	6,439	3.18	2.67	97.33	0.67	3.11	16.17	33.65	46.40	42.94	28.03
Northwest (20)	288,322	10,241	3.55	2.81	97.19	0.73	2.86	18.02	38.38	40.02	48.36	28.36
Sierra Pacific (21)	293,645	9,636	3.28	2.33	97.67	0.47	2.89	17.29	34.00	45.37	45.38	29.79
Desert Pacific (22)	328,951	9,657	2.94	2.46	97.54	0.97	4.24	20.16	36.91	37.74	43.60	31.97
Midwest (23)	324,728	13,504	4.16	1.65	98.35	0.30	2.08	12.56	28.91	56.18	48.86	21.90
<b>Grand Total</b>	<b>6,212,400</b>	<b>226,727</b>	<b>3.65</b>	<b>2.34</b>	<b>97.66</b>	<b>0.75</b>	<b>3.63</b>	<b>18.09</b>	<b>34.37</b>	<b>43.17</b>	<b>43.54</b>	<b>29.46</b>

# Congestive Heart Failure



**Map 1:**  
Number of VHA Patients with Congestive Heart Failure  
By VISN FY - 2014

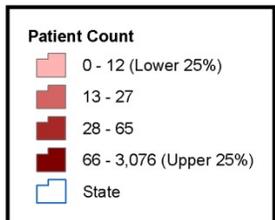
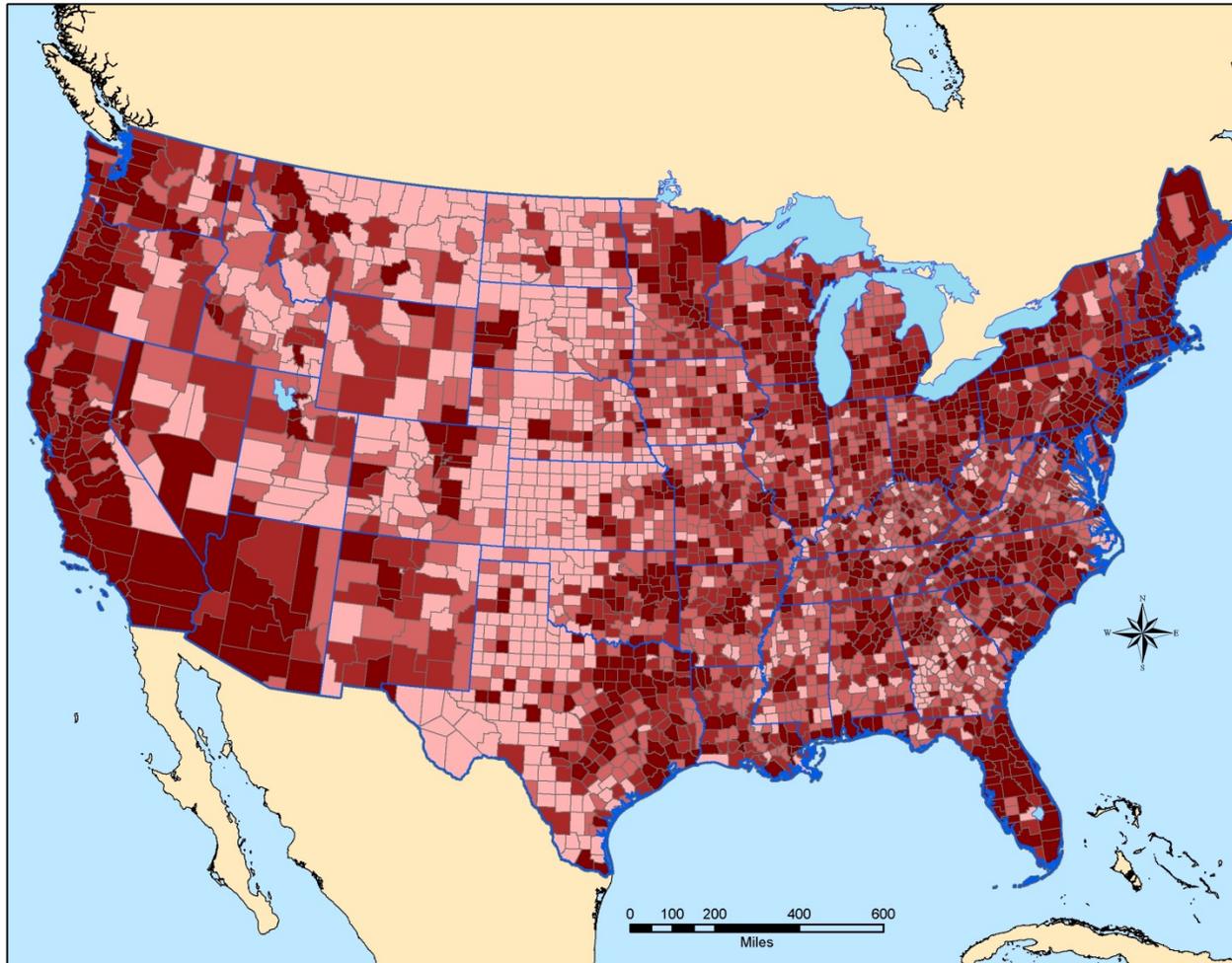


**Map 2:**  
Number of VHA Patients with Congestive Heart Failure  
By State FY - 2014

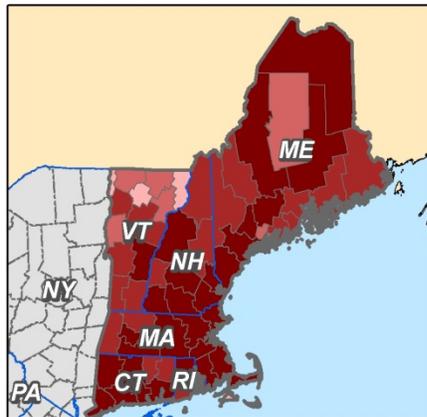


Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
(Map Creation Date: 8/13/2015)  
Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

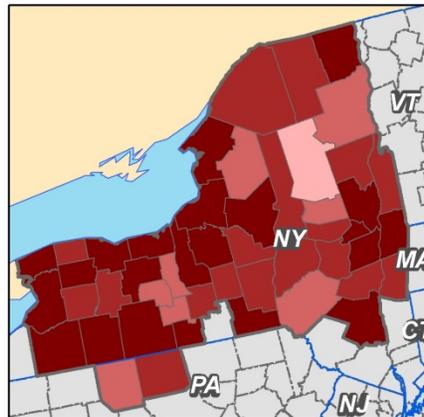
# Congestive Heart Failure



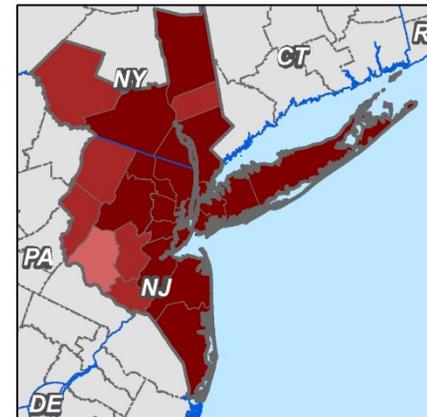
**Map 3:**  
Number of VHA Patients with Congestive Heart Failure  
By County FY - 2014



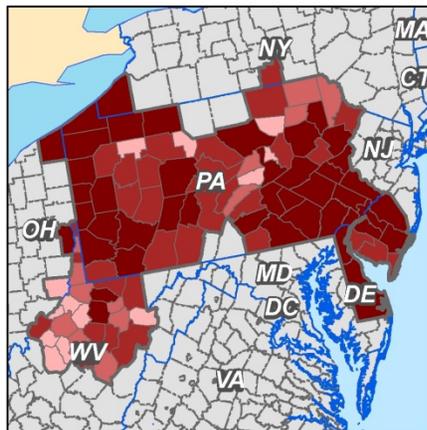
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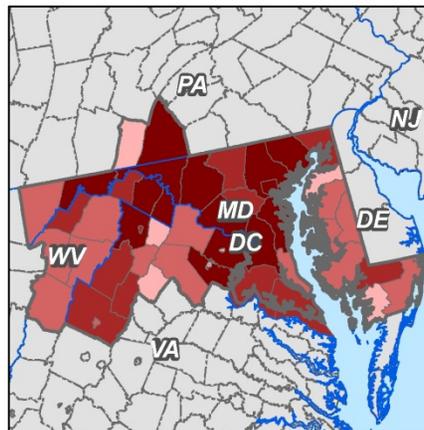
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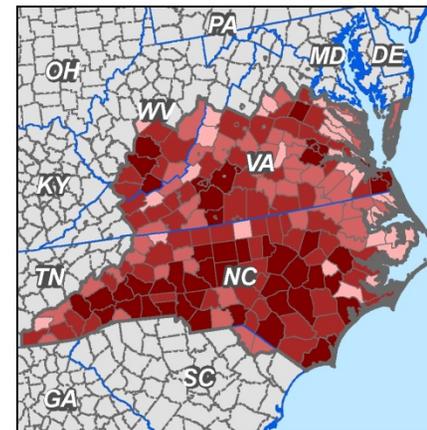
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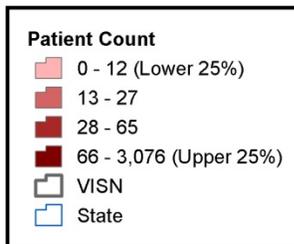
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VISN 6

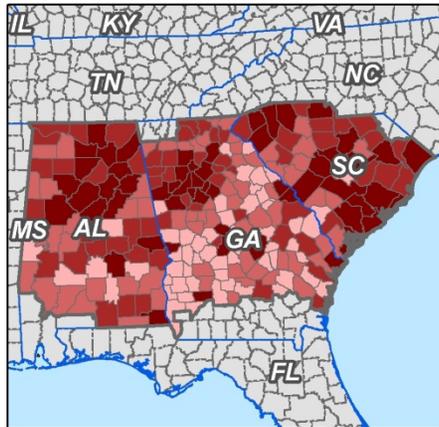


Map 4:  
Number of VHA Patients  
with Congestive Heart Failure  
by County, FY - 2014

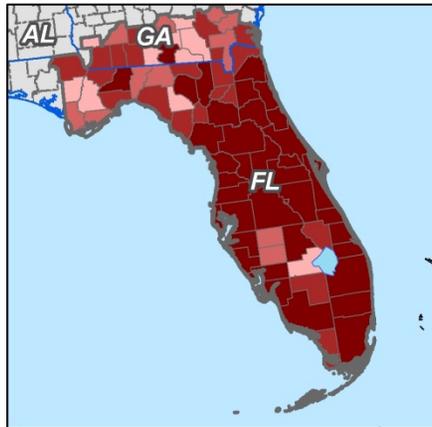


Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
(Map Creation Date: 8/12/2015)  
Map Information by: PSSG, VSSC, ESRI  
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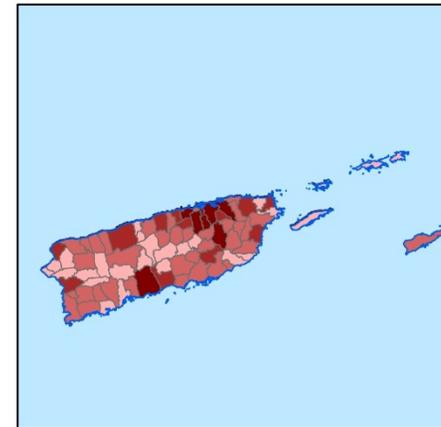
# Congestive Heart Failure



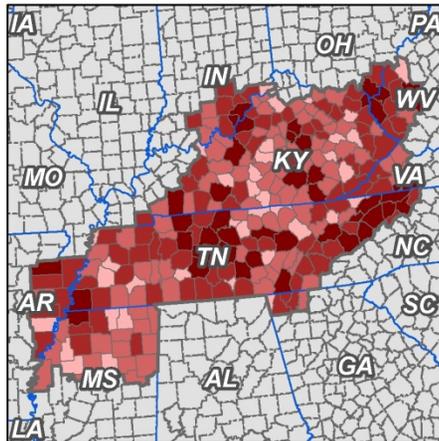
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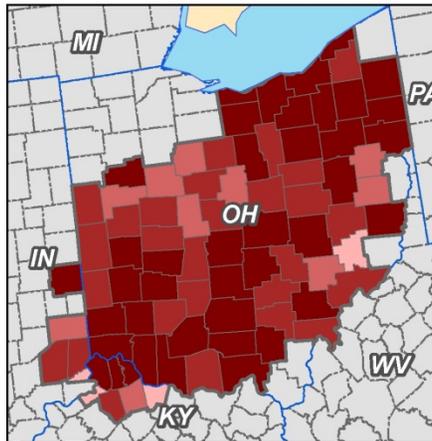
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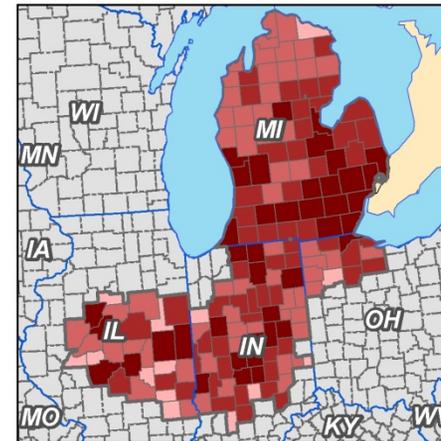
VISN 8 Puerto Rico & Virgin Islands



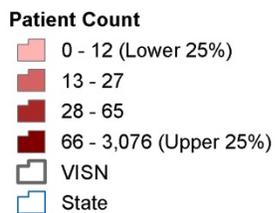
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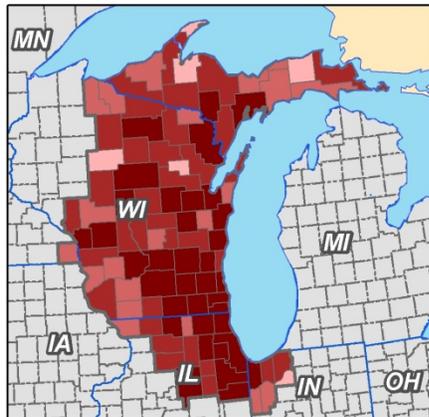
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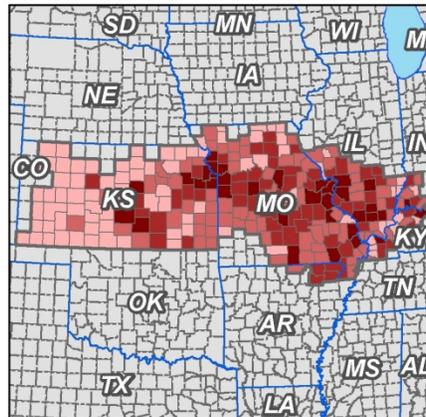
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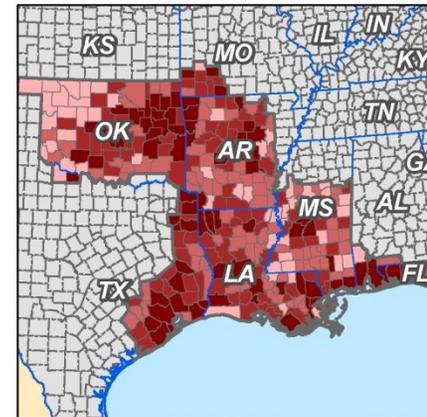
Map 5:  
Number of VHA Patients  
with Congestive Heart Disorder  
By County FY - 2014



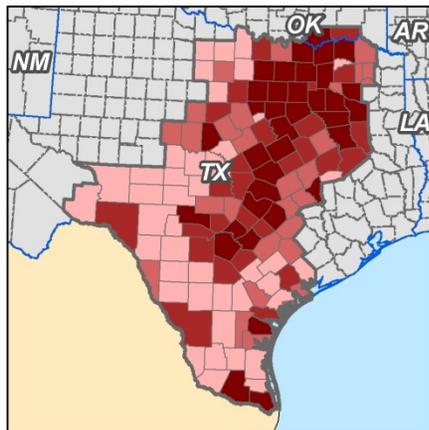
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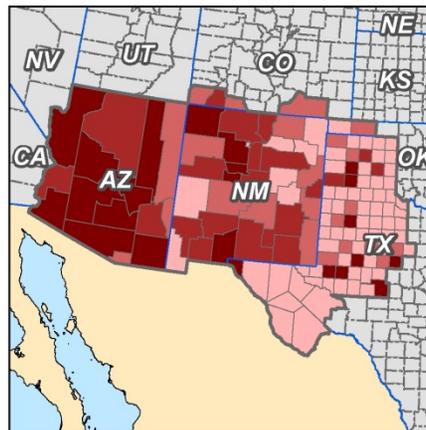
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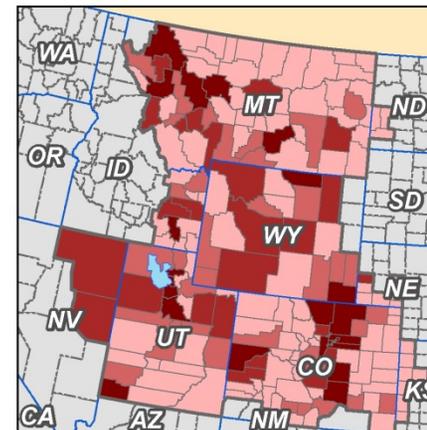
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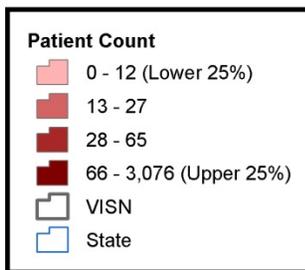
VISN 17



VISN 18



VISN 19

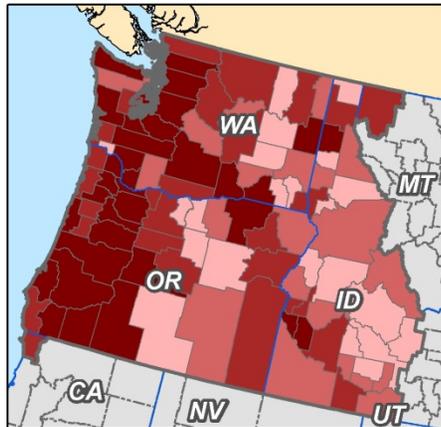


Map 6:  
Number of VHA Patients  
with Congestive Heart Failure  
By County, FY - 2014

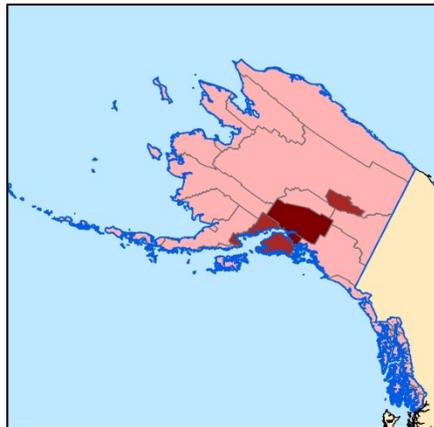


Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
(Map Creation Date: 8/12/2015)  
Map Information by: PSSG, VSSC, ESRI  
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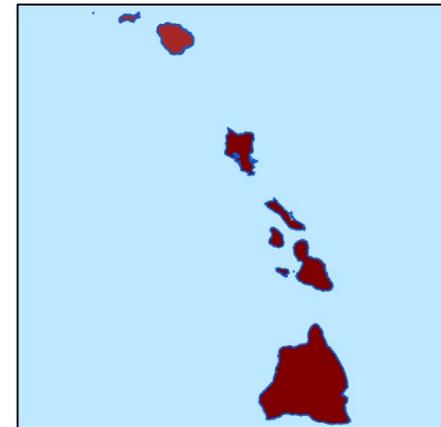
# Congestive Heart Failure



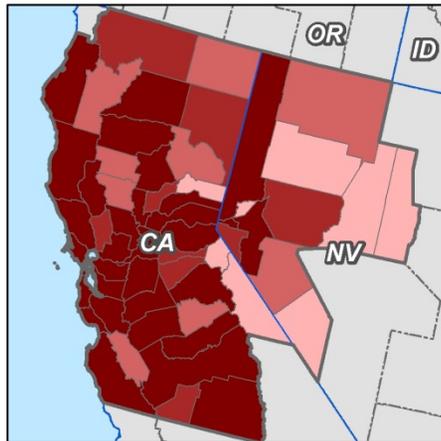
VISN 20



VISN 20- Alaska



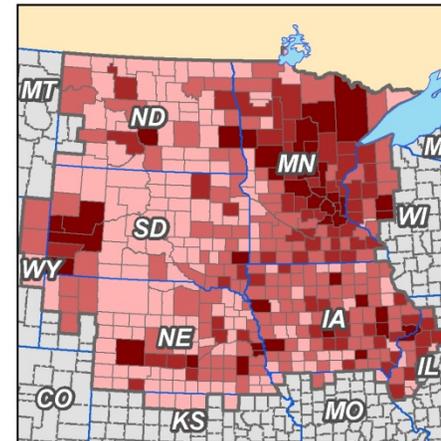
VISN 21- Hawaii



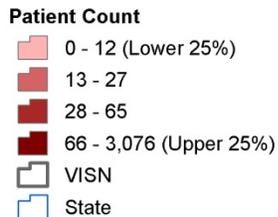
VISN 21



VISN 22



VISN 23



Map 7:  
Number of VHA Patients with Congestive Heart Failure By County, FY - 2014

## Section II Highlights: Rural and Highly Rural VHA Patients with Congestive Heart Failure

This section focuses on the overall prevalence of Congestive Heart Failure in each Veterans Integrated Service Network, broken down by the following rurality categories: *highly rural*, *rural*, *urban*, and *unknown*. Beginning with Fiscal Year 2011, the repository from where these data were extracted obtained the rural designation data from the most recent geocoded rurality table provided by VHA's Planning System Support Group (PSSG). If not available from this source, the repository's algorithm then looks to the Office of Rural Health's (ORH) ZIP-based file located on the ORH website.<sup>1</sup> In FY-2014\*, the VHA's definition of rurality was based on the U.S. Census definition for rural and urban, with an added category of Highly Rural. The definition of these categories is as follows:

- ❖ *urban* - areas defined by U.S. Census as an urbanized area
- ❖ *rural* - all other areas excluded in U.S. Census defined urbanized areas
- ❖ *highly rural* - any rural area within a county with less than 7.0 civilians per square mile

Since the *rural* and *highly rural* categories are of particular interest in this volume, numbers and percentages are distinctively highlighted in shades of blue in Table 2. For the maps, urban areas are shaded and urban patients are removed from the numerator and denominator. The maps in this section illustrate graphically the data on rural and highly rural patients with Congestive Heart Failure. For this section, both the number and the percentages of rural and highly rural patients with Congestive Heart Failure at the VISN, State, and county levels are mapped.

\*Note: Starting at the beginning of FY-2015, the VA changed its definitions based on Rural-Urban Commuting Area (RUCA) Codes. Future editions of the Rural Veterans Health Care Atlas will use the new definition of rurality: Urban Area: Census tracts with at least 30 percent of the population residing in an urbanized area as defined by the Census Bureau; Rural Area: Land areas not designed as urban or highly rural. Highly Rural Area: Sparsely populated areas — less than 10 percent of the working population commutes to any community larger than an urbanized cluster, which is typically a town of no more than 2,500 people.

## National Overview

In FY-2014, 226,727 VHA patients had a primary or secondary diagnosis of Congestive Heart Failure. The majority of patients with Congestive Heart Failure lived in urban areas (60.01%). However, more than nearly half resided in either rural (N=87,288) or highly rural (N=3,293) areas (40.0% combined).

## VISN Overview

The Rocky Mountain Network (VISN 19) had the highest number of patients with Congestive Heart Failure residing in a defined *highly rural* area at 942, which represented 14.63% of the total number of patients with Congestive Heart Failure in that network (Table 2). The South Central Network (VISN 16) had the highest number of patients with Congestive Heart Failure residing in a defined *rural* area at 10,706, which represented 52.04% of the total number of patients with Congestive Heart Failure in that network. Five of the 21 VISNs had a higher proportion of *rural* patients than *urban* patients with Congestive Heart Failure: Mid-Atlantic Network (VISN 6), Mid South Network (VISN 9), Heartland Network (VISN 15), South Central Network (VISN 16), and Midwest Network (VISN 23).

Map 8 and Map 9 show the number and percentages of rural and highly rural patient with Congestive Heart Failure by VISN. VISNs 9, 15, and 16 show both a high volume of rural and highly rural patients with Congestive Heart Failure and a large proportion of their rural and highly rural patient population who have this disorder. VISN 7 had a relatively large number of patients with Congestive Heart Failure, but the proportion of rural and highly rural patients with Congestive Heart Failure represented a low to moderate percentage of the total rural and highly rural patient population. Conversely, VISN 10 had a low to moderate number of combined rural and highly rural patients with Congestive Heart Failure, but this disorder was quite prevalent in the rural and highly rural patient population (upper 25% quartile).

## State Overview

Map 10 shows the number of VHA rural and highly rural patients with Congestive Heart Failure by State (by quartile). The top 10 States with the highest number of rural and highly rural patients with Congestive Heart Failure by rank order were: Texas (N=6,842), Ohio (N=4,170), North Carolina (N=3,662), Florida (N=3,304), Tennessee (N=3,291), Missouri (N=3,272), Pennsylvania (N=3,100), Kentucky (N=3,096), Oklahoma (N=2,982), and Minnesota (N=2,978). The proportion

of rural and highly rural patients with Congestive Heart Failure to the total rural and highly rural patient population is displayed in Map 11. The States with the highest percentage of their rural and highly rural patients (and more than 10 patients classified as rural or highly rural) that had Congestive Heart Failure were: Oklahoma (5.67%), Arkansas (5.11%), Kentucky (5.10%), Utah (5.06%), Texas (5.04%), Nebraska (5.03%), Louisiana (5.03%), Tennessee (4.94%), South Dakota (4.92%), and Ohio (4.86%).

### **County Overview**

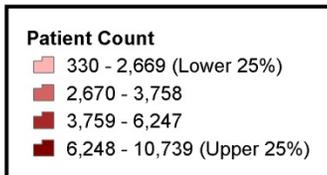
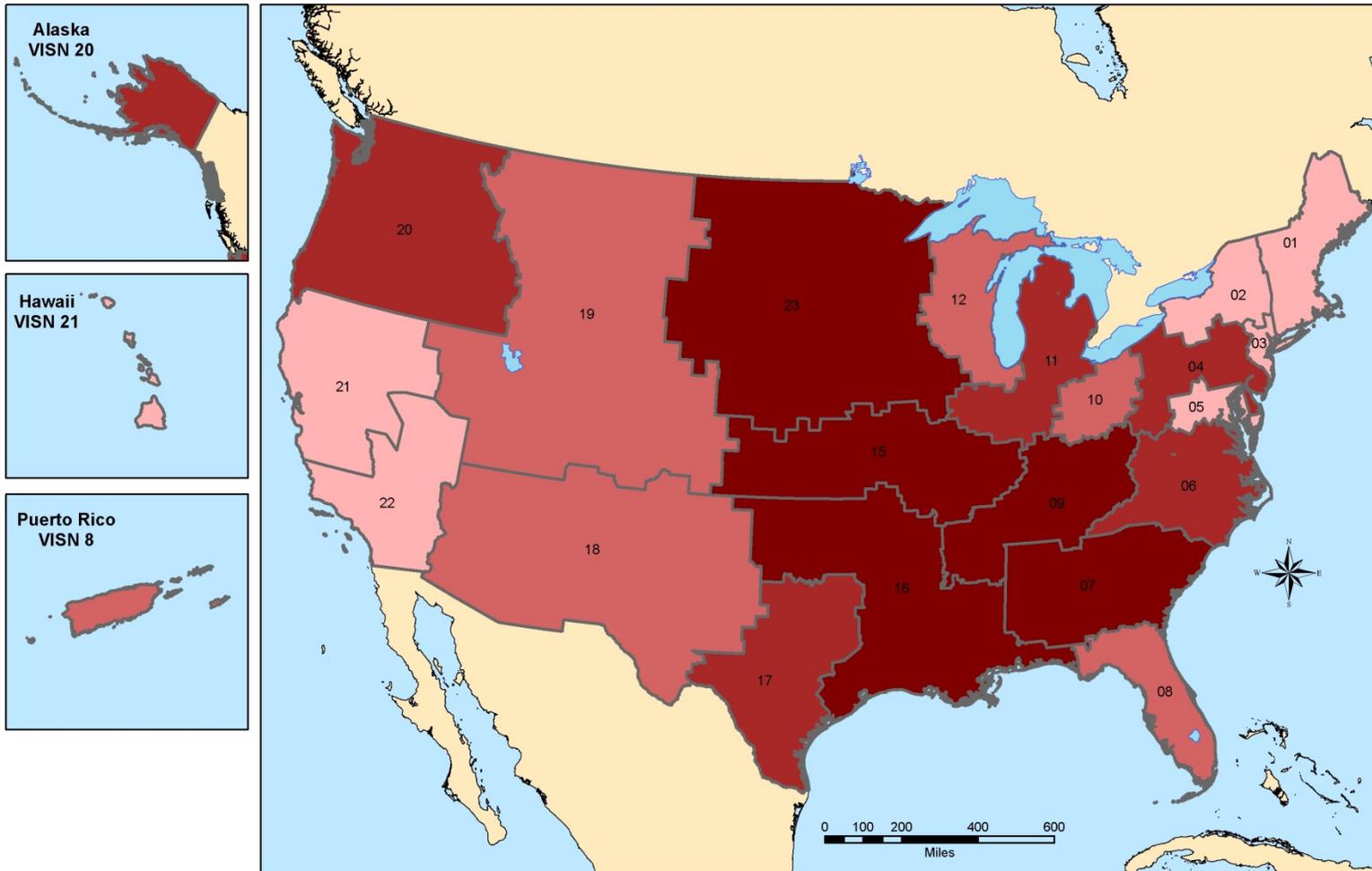
The number of rural and highly rural patients with Congestive Heart Failure by county is displayed by quartiles in Map 12, with the highest one-third in terms of volume designated by the darkest shade. The proportion of rural and highly rural patients with Congestive Heart Failure of the total rural and highly rural patient population is portrayed in Map 13, with the highest 25% in terms of proportion designated in the darkest shade. In addition to the National map, eight additional maps are provided that zoom to the VISN level (Maps 14-21) to give a clearer picture of the number and percentages of rural and highly rural patients with Congestive Heart Failure and the geographic patterns by county within each VISN. The top 10 counties with the largest number of VHA rural and highly rural patients with Congestive Heart Failure across the US were in the States of Oregon (1 county), Florida (2 counties), Arizona (3 counties), Oklahoma (1 county), California (1 county), and Ohio (2 counties). Douglas County, Oregon had the largest number of rural and highly rural patients with Congestive Heart Failure (N=382) followed by, in rank order: Marion County, Florida (N=284), Pima County, Arizona (N=271), Muskogee County, Oklahoma (N=257), Columbia County, Florida (N=239), Yavapai County, Arizona (N=225), Mohave County, Arizona (N=223), San Bernardino County, California (N=222), Ross County, Ohio (N=221), and Ashtabula County, Ohio (N=217). The top 10 counties with the largest proportion of their rural and highly rural patients (and there were at least 10 rural and highly rural patients) with a Congestive Heart Failure diagnostic code were Hayes County, Nebraska (21.43%), Blaine County, Nebraska (18.75%), Jackson County, Colorado (13.79%), Stanton County, Kansas (13.33%), Baylor County, Texas (12.82%), Comanche County, Kansas (11.90%), Stonewall County, Texas (11.76%), Sterling County, Texas (11.76%), Logan County, North Dakota (11.29%), and Jefferson County, Mississippi (11.26%).

# Congestive Heart Failure



**Table 2: National and VISN Numbers and Percentages of VHA Patients with Congestive Heart Failure by Rurality, FY-2014**

Prevalence Statistics by Rurality- Congestive Heart Failure, FY-2014									
Veterans Integrated Service Network	Total Number of Patients with Congestive Heart Failure	Highly Rural		Rural		Urban		Unknown	
		N	(%)	N	(%)	N	(%)	N	(%)
New England (01)	8,437	25	0.30	2,514	29.80	5,895	69.87	3	0.04
Upstate NY (02)	4,862	3	0.06	2,335	48.03	2,525	51.93	*	*
NY/NJ (03)	5,797	*	*	329	5.68	5,467	94.31	*	*
Stars and Stripes (04)	12,217	*	*	4,428	36.24	7,787	63.74	*	*
Capitol (05)	3,872	*	*	957	24.72	2,914	75.26	*	*
Mid-Atlantic (06)	12,465	5	0.04	6,242	50.08	6,220	49.90	3	0.02
Southeast (07)	14,265	*	*	6,390	44.79	7,875	55.21	*	*
Sunshine (08)	18,013	*	*	3,682	20.44	14,328	79.54	*	*
Mid South (09)	13,614	*	*	7,795	57.26	5,823	42.77	*	*
Ohio (10)	10,129	*	*	3,757	37.09	6,372	62.91	*	*
Vets in Partnership (11)	10,782	*	*	4,705	43.64	6,077	56.36	*	*
Great Lakes (12)	10,996	24	0.22	3,562	32.39	7,407	67.36	3	0.03
Heartland (15)	11,055	104	0.94	6,200	56.08	4,751	42.98	*	*
South Central (16)	20,571	33	0.16	10,706	52.04	9,830	47.79	*	*
Heart of Texas (17)	11,063	83	0.75	4,278	38.67	6,702	60.58	3	0.03
Southwest (18)	9,112	465	5.10	2,753	30.21	5,889	64.63	5	0.05
Rocky Mtn. (19)	6,439	942	14.63	1,738	26.99	3,756	58.33	3	0.05
Northwest (20)	10,241	509	4.97	3,760	36.72	5,973	58.32	*	*
Sierra Pacific (21)	9,636	160	1.66	2,509	26.04	6,889	71.49	78	0.81
Desert Pacific (22)	9,657	113	1.17	860	8.91	8,686	89.95	*	*
Midwest (23)	13,504	820	6.07	7,788	57.67	4,898	36.27	*	*
<b>Grand Total</b>	<b>226,727</b>	<b>3,293</b>	<b>1.45</b>	<b>87,288</b>	<b>38.50</b>	<b>136,064</b>	<b>60.01</b>	<b>112</b>	<b>0.05</b>

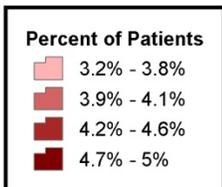
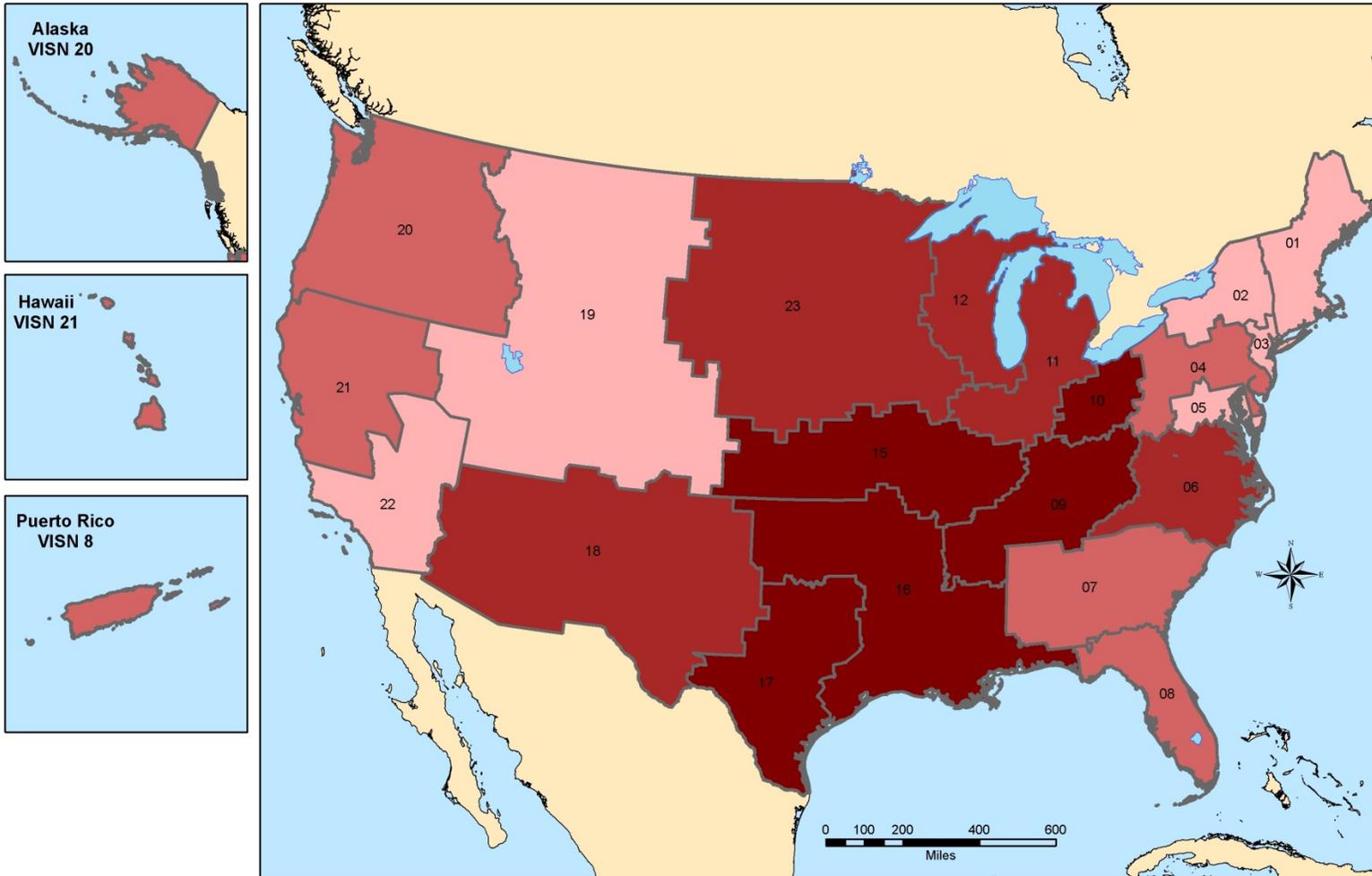


**Map 8:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
By VISN FY - 2014

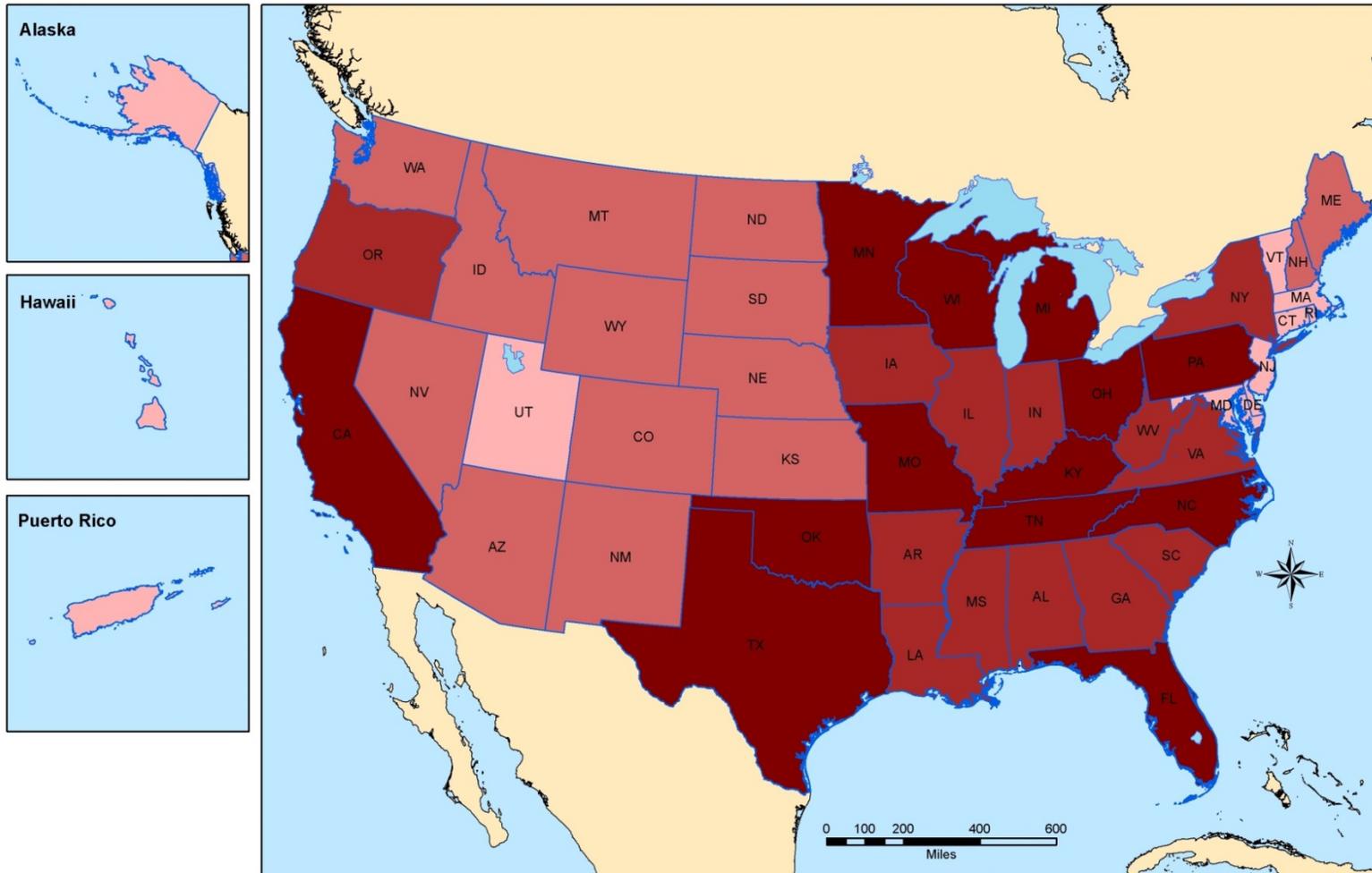
 **GeoSpatial  
Outcomes Division**  
VHA Office of Rural Health

Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
(Map Creation Date: 8/11/2015)  
Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 9:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure  
Of All Rural and Highly Rural VHA Patients  
By VISN FY - 2014



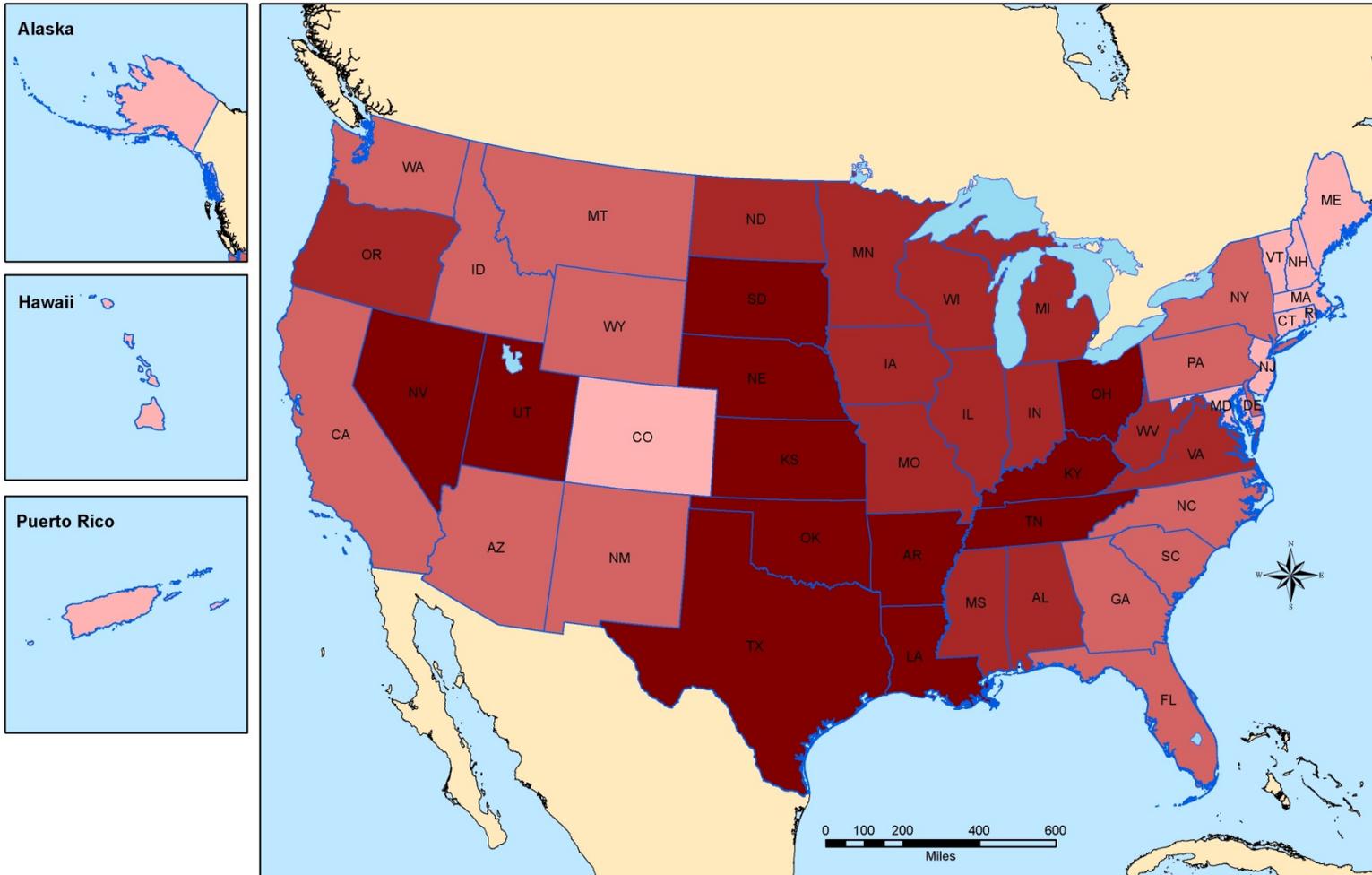
Patient Count	
<span style="display:inline-block; width:15px; height:10px; background-color:lightpink; border:1px solid black;"></span>	0 - 394 (Lower 25%)
<span style="display:inline-block; width:15px; height:10px; background-color:lightcoral; border:1px solid black;"></span>	395 - 1,507
<span style="display:inline-block; width:15px; height:10px; background-color:darkred; border:1px solid black;"></span>	1,508 - 2,735
<span style="display:inline-block; width:15px; height:10px; background-color:firebrick; border:1px solid black;"></span>	2,736 - 6,842 (Upper 25%)

**Map 10:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
By State FY - 2014

 **GeoSpatial  
Outcomes Division**  
VHA Office of Rural Health

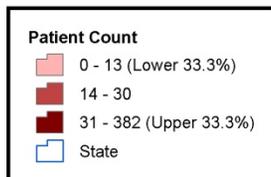
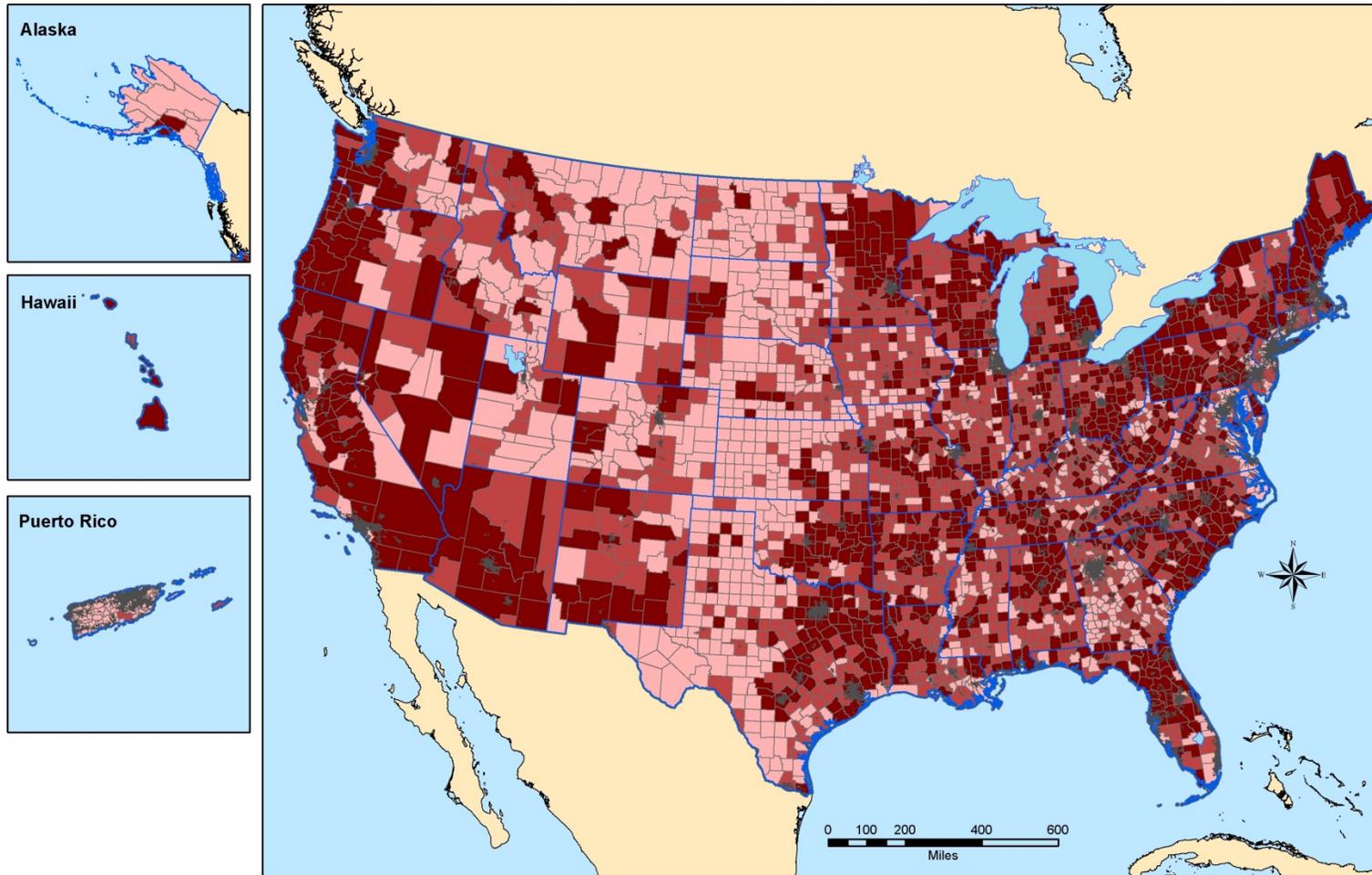
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GeoSpatial Outcomes Division  
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# Congestive Heart Failure



Map 11:

Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure of All Rural and Highly Rural Patients By State FY - 2014

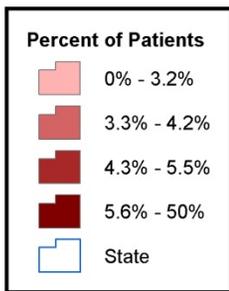
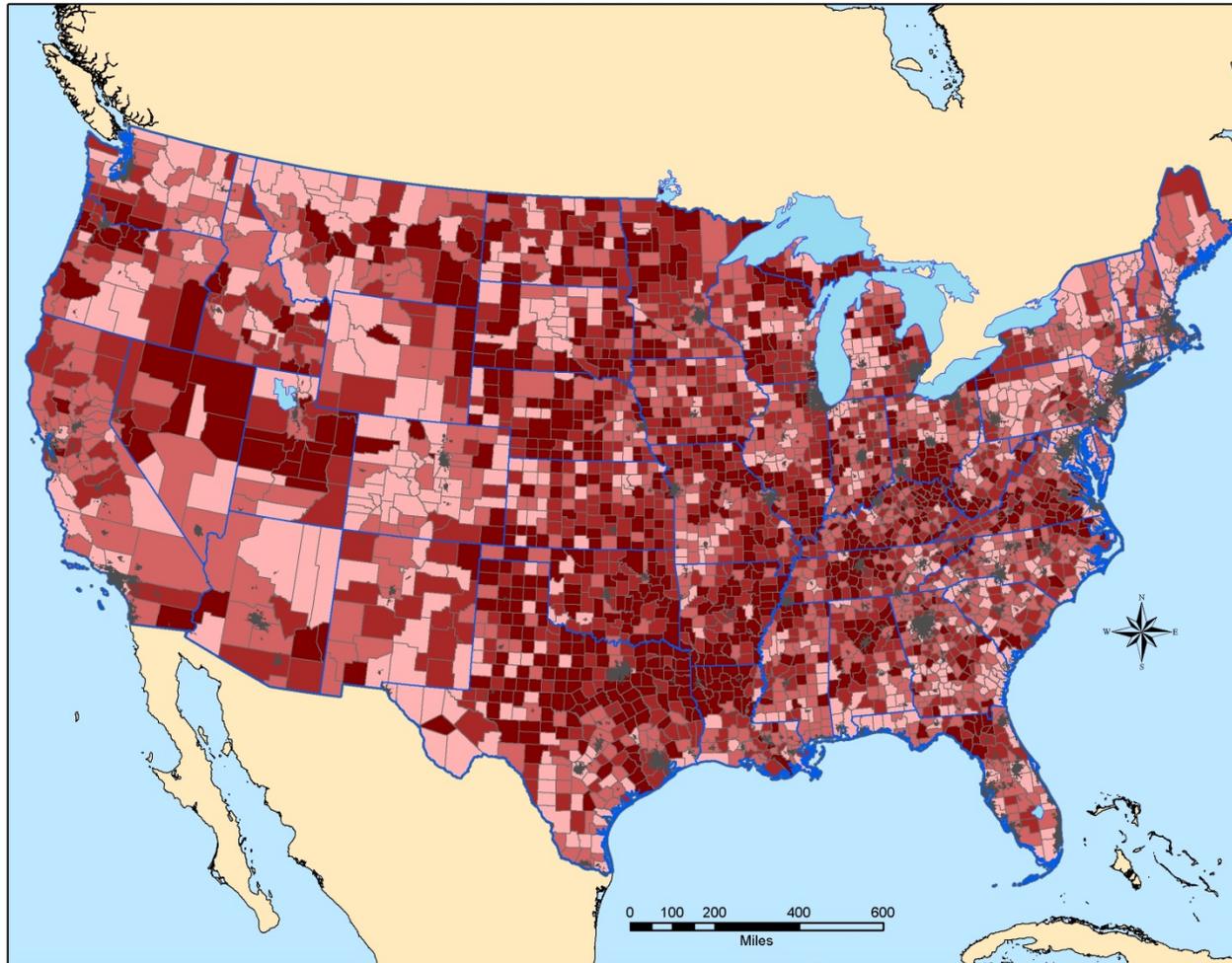


**Map 12:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
By County FY - 2014  
Urban Areas "Shaded"

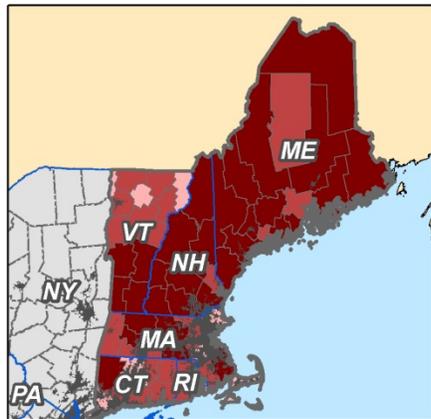


Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
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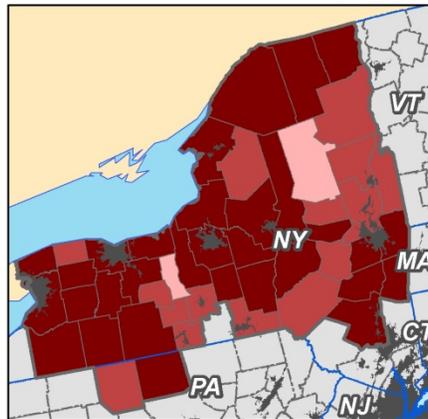
# Congestive Heart Failure



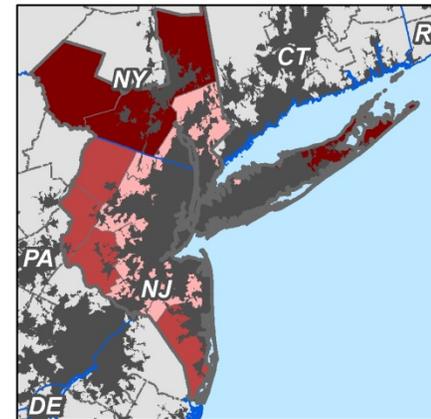
**Map 13:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure Of All Rural and Highly Rural Patients By County FY - 2014  
Urban Areas "Shaded"



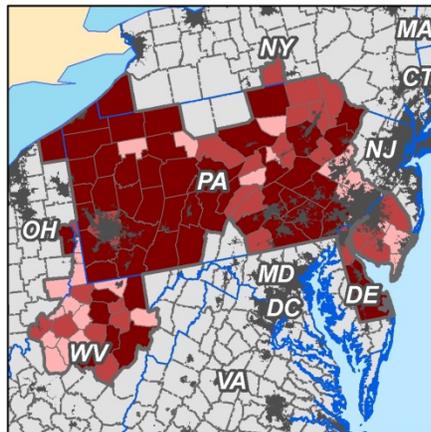
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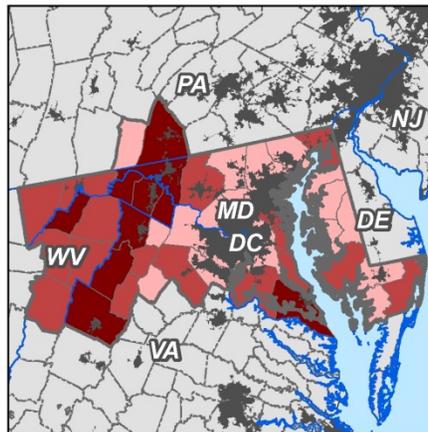
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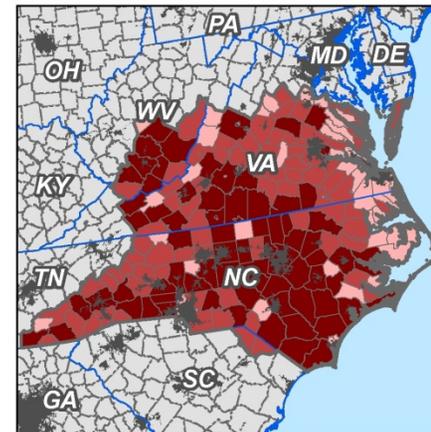
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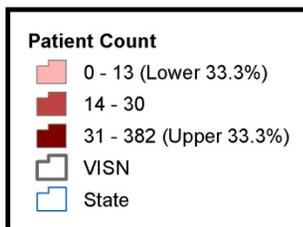
VISN 4



VISN 5



VISN 6



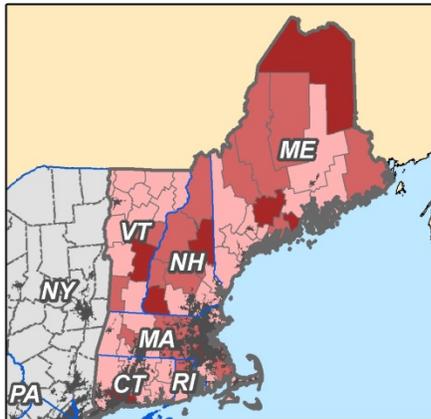
Map 14:

Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
By County FY - 2014  
Urban Areas "Shaded"

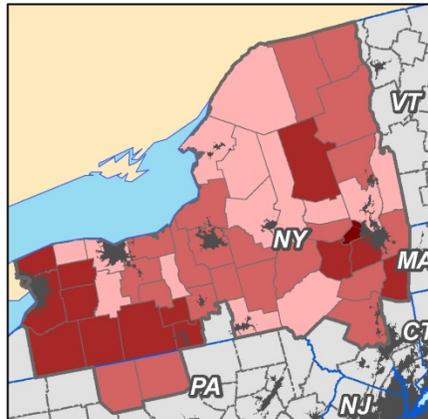


Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
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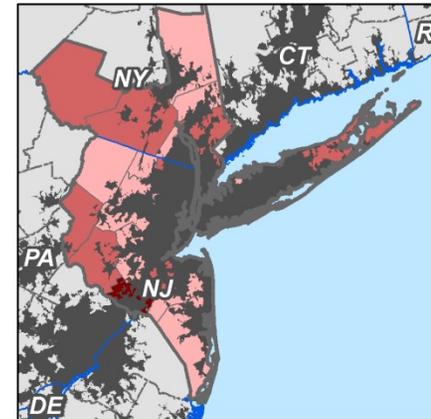
# Congestive Heart Failure



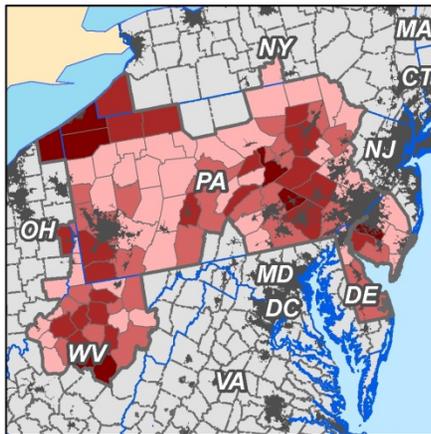
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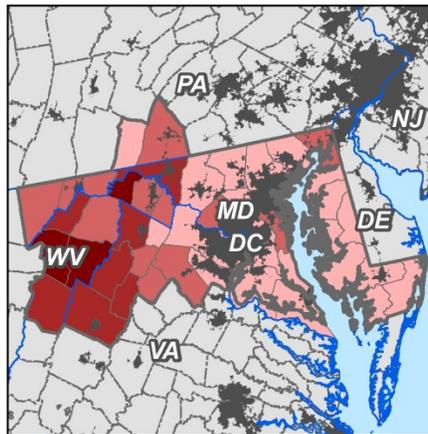
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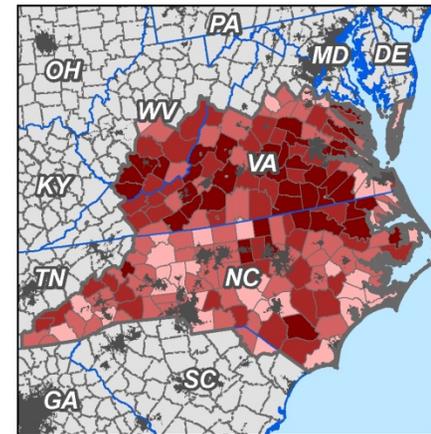
VISN 3



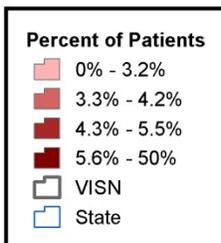
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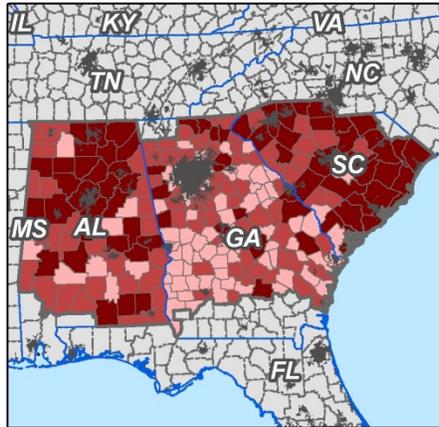
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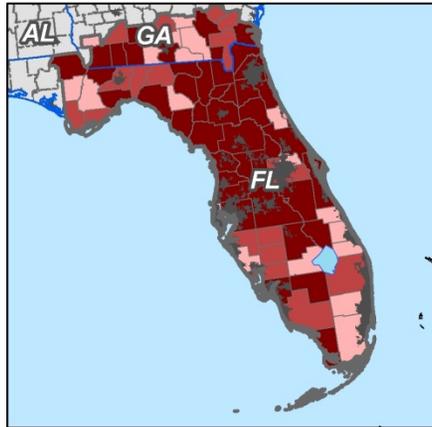
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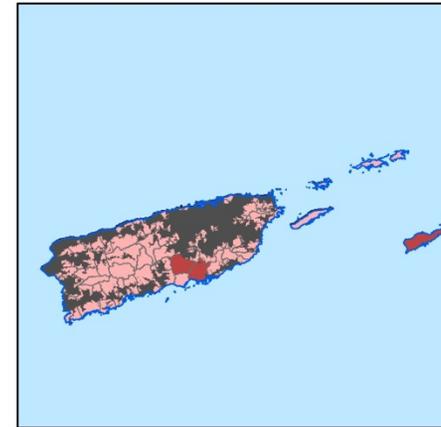
Map 15:  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure Of All Rural and Highly Rural Patients By County FY - 2014  
Urban Areas "Shaded"



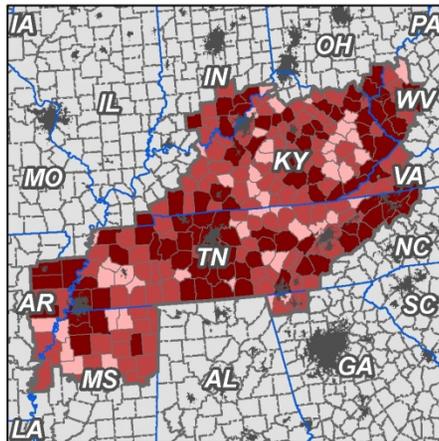
VISN 7



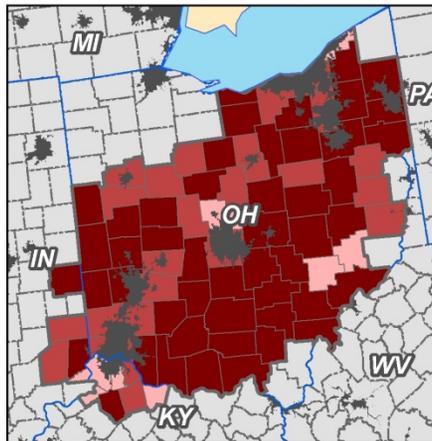
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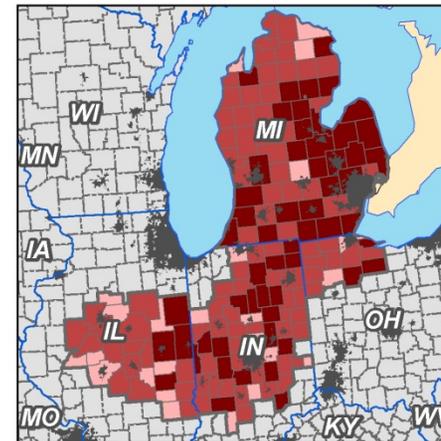
VISN 8 Puerto Rico & Virgin Islands



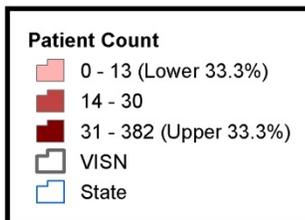
VISN 9



VISN 10



VISN 11



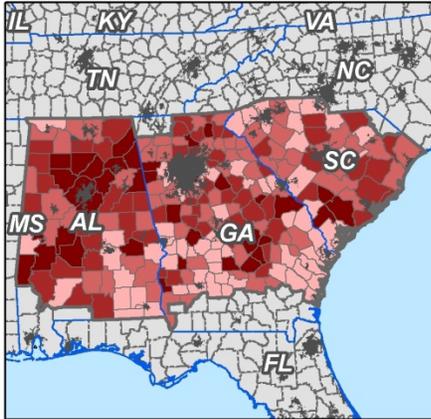
Map 16:

Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
By County FY - 2014  
Urban Areas "Shaded"

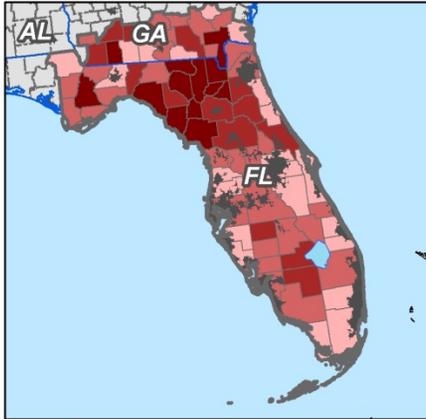


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GeoSpatial Outcomes Division  
(Map Creation Date: 8/12/2015)  
Map Information by: PSSG, VSSC, ESRI  
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# Congestive Heart Failure



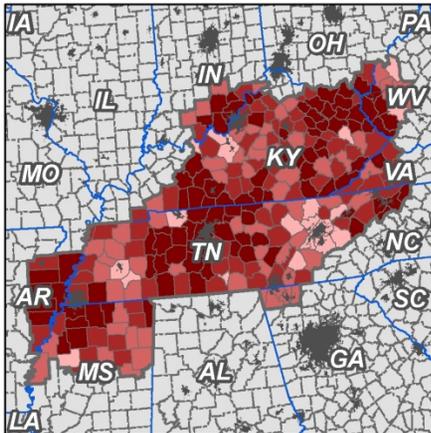
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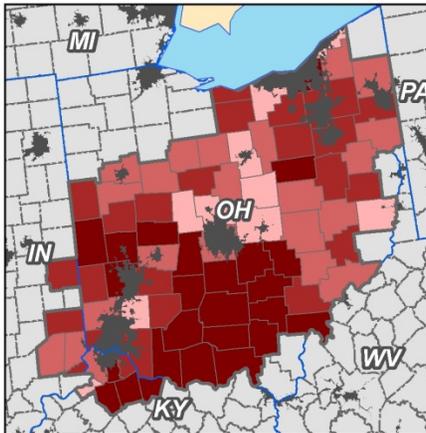
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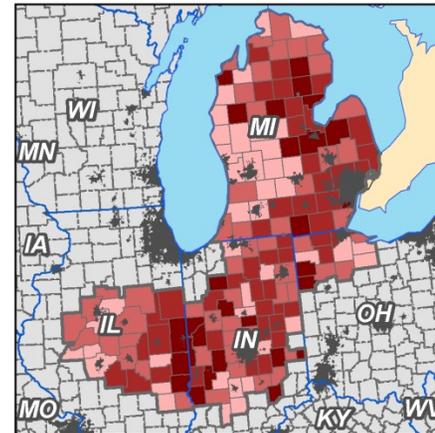
VISN 8 Puerto Rico & Virgin Islands



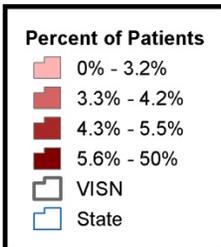
VISN 9



VISN 10

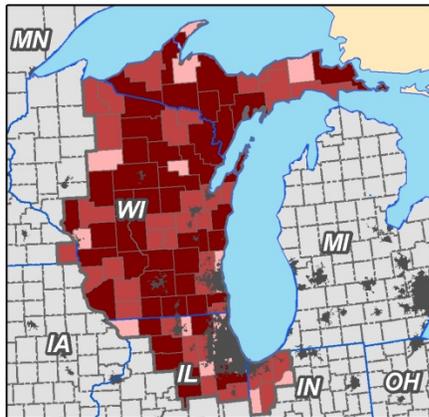


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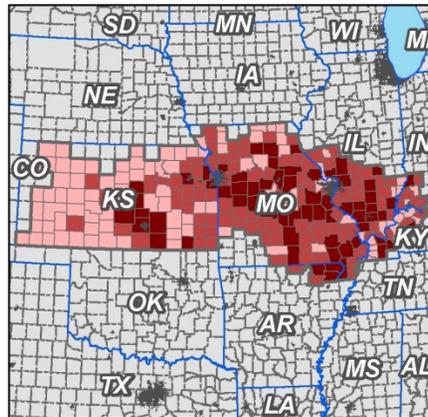


Map 17:

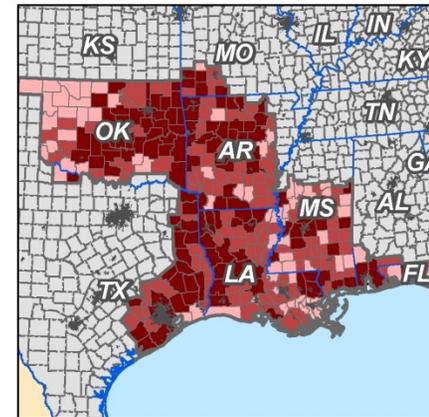
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure Of All Rural and Highly Rural Patients By County FY - 2014 Urban Areas "Shaded"



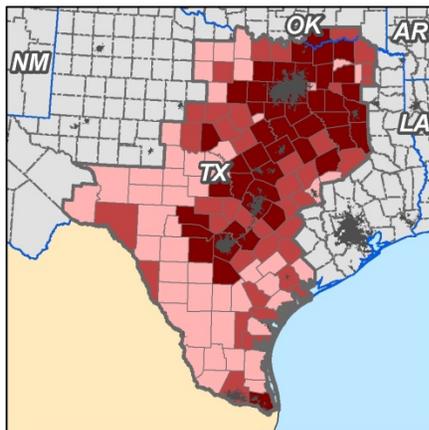
VISN 12



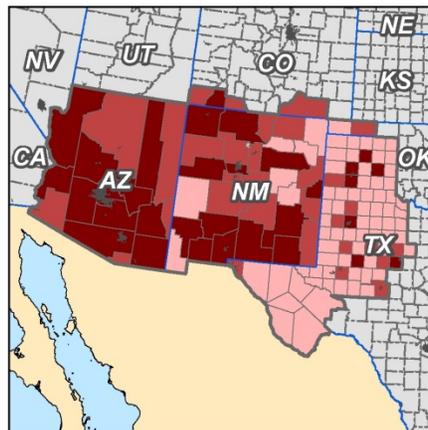
VISN 15



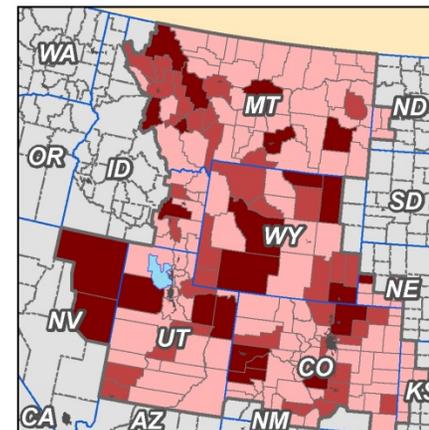
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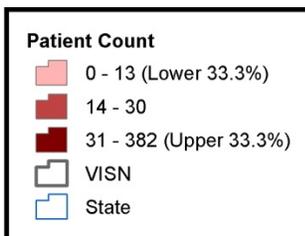
VISN 17



VISN 18



VISN 19



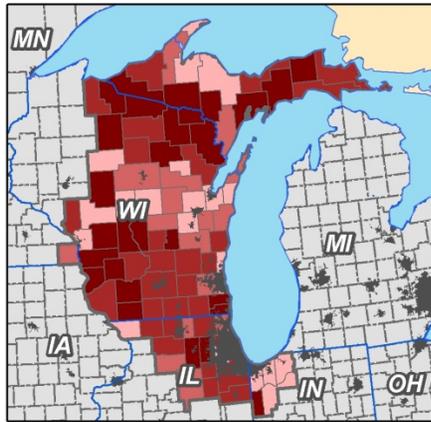
Map 18:

Number of Rural and Highly Rural VHA Patients with Congestive Heart Failure By County FY - 2014  
Urban Areas "Shaded"

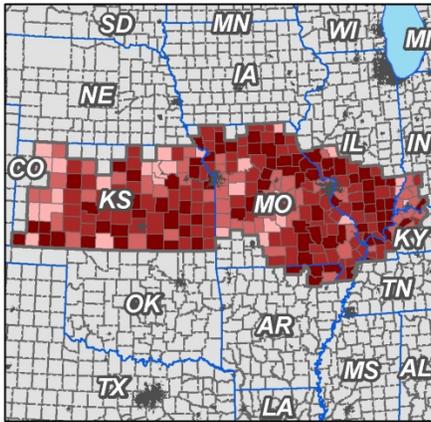


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GeoSpatial Outcomes Division  
(Map Creation Date: 8/12/2015)  
Map Information by: PSSG, VSSC, ESRI  
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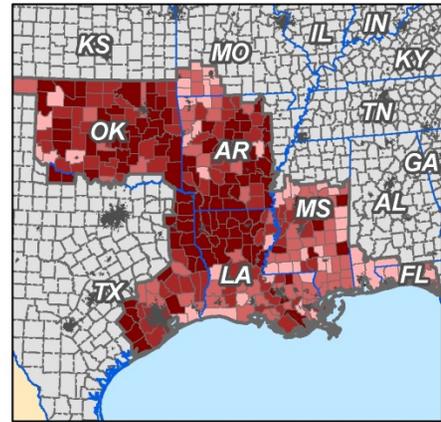
# Congestive Heart Failure



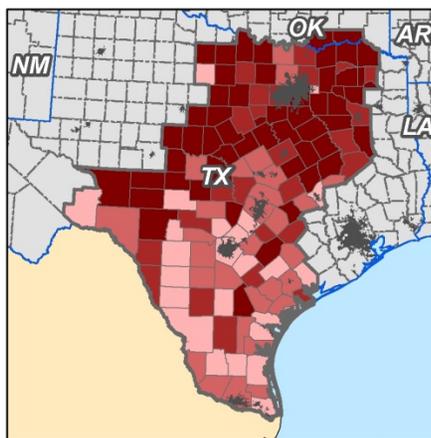
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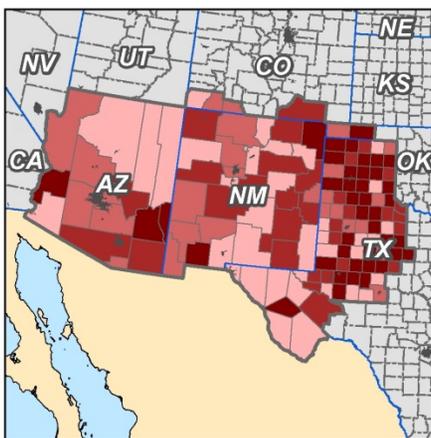
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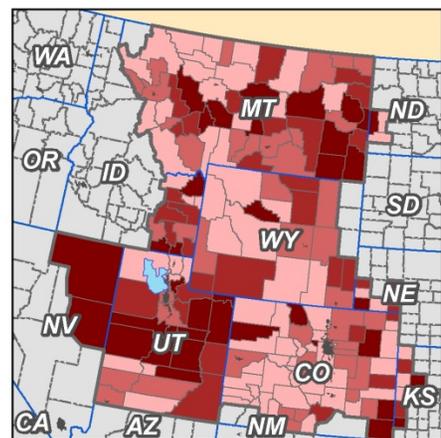
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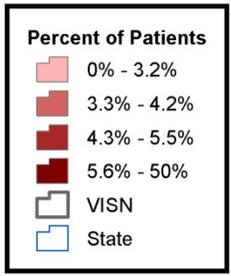
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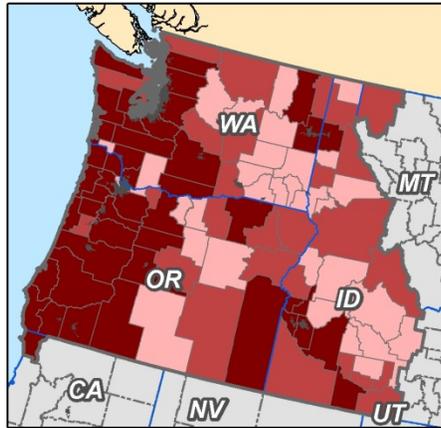
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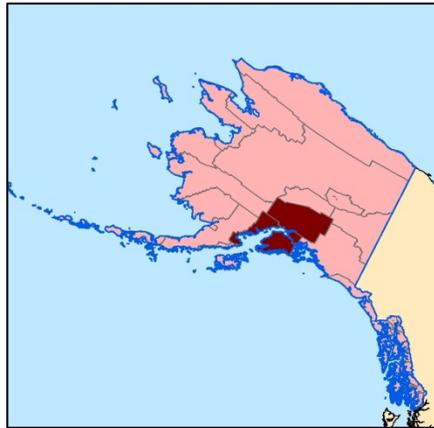
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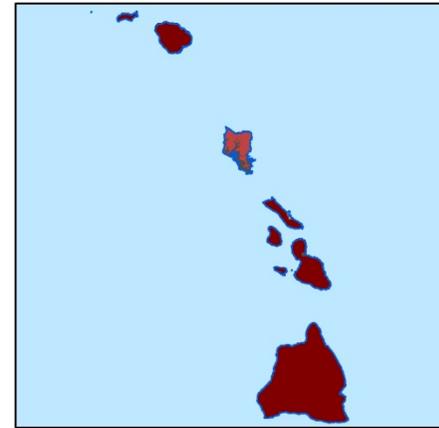
Map 19:  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure Of All Rural and Highly Rural Patients By County FY - 2014  
Urban Areas "Shaded"



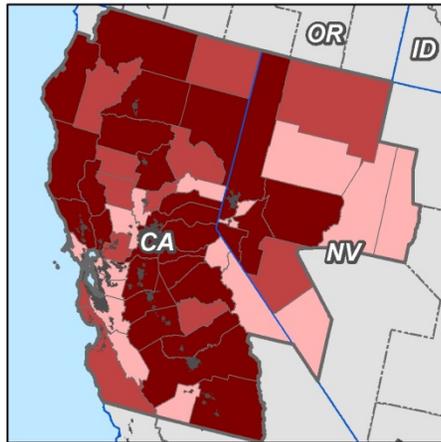
VISN 20



VISN 20- Alaska



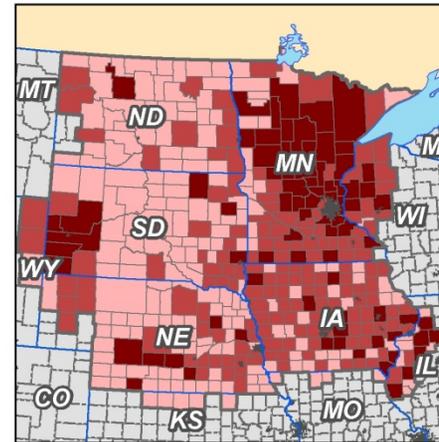
VISN 21- Hawaii



VISN 21



VISN 22



VISN 23

**Patient Count**

- 0 - 13 (Lower 33.3%)
- 14 - 30
- 31 - 382 (Upper 33.3%)
- VISN
- State

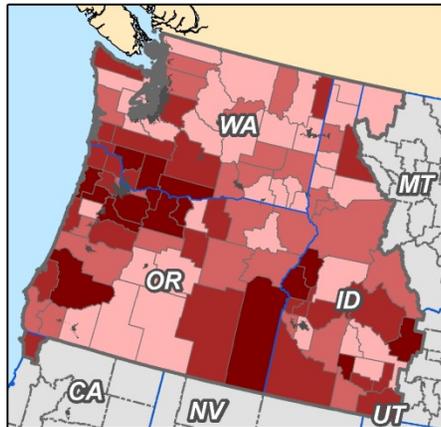
Map 20:

Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
By County FY - 2014  
Urban Areas "Shaded"

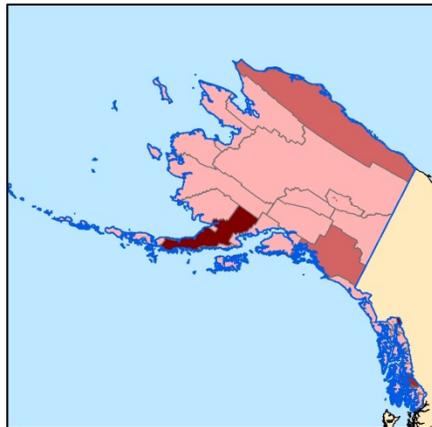


Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
(Map Creation Date: 8/12/2015)  
Map Information by: PSSG, VSSC, ESRI  
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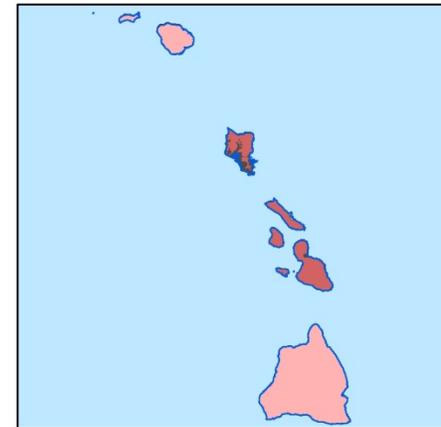
# Congestive Heart Failure



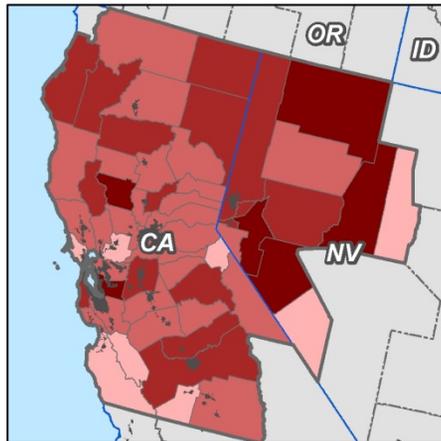
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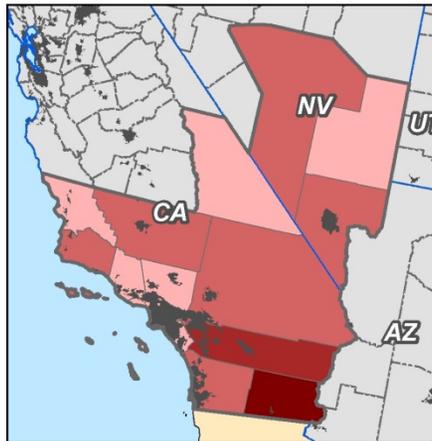
VISN 20- Alaska



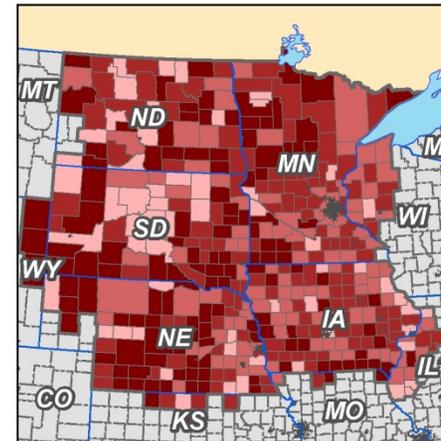
VISN 21- Hawaii



VISN 21

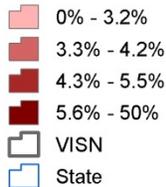


VISN 22



VISN 23

**Percent of Patients**



**Map 21:**

Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure Of All Rural and Highly Rural Patients By County FY - 2014 Urban Areas "Shaded"

**Section III Highlights: Rural and Highly Rural VHA Subgroups of Patients with CHF**

**GENDER**

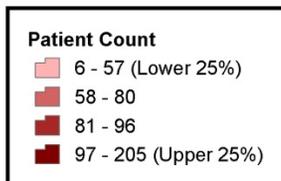
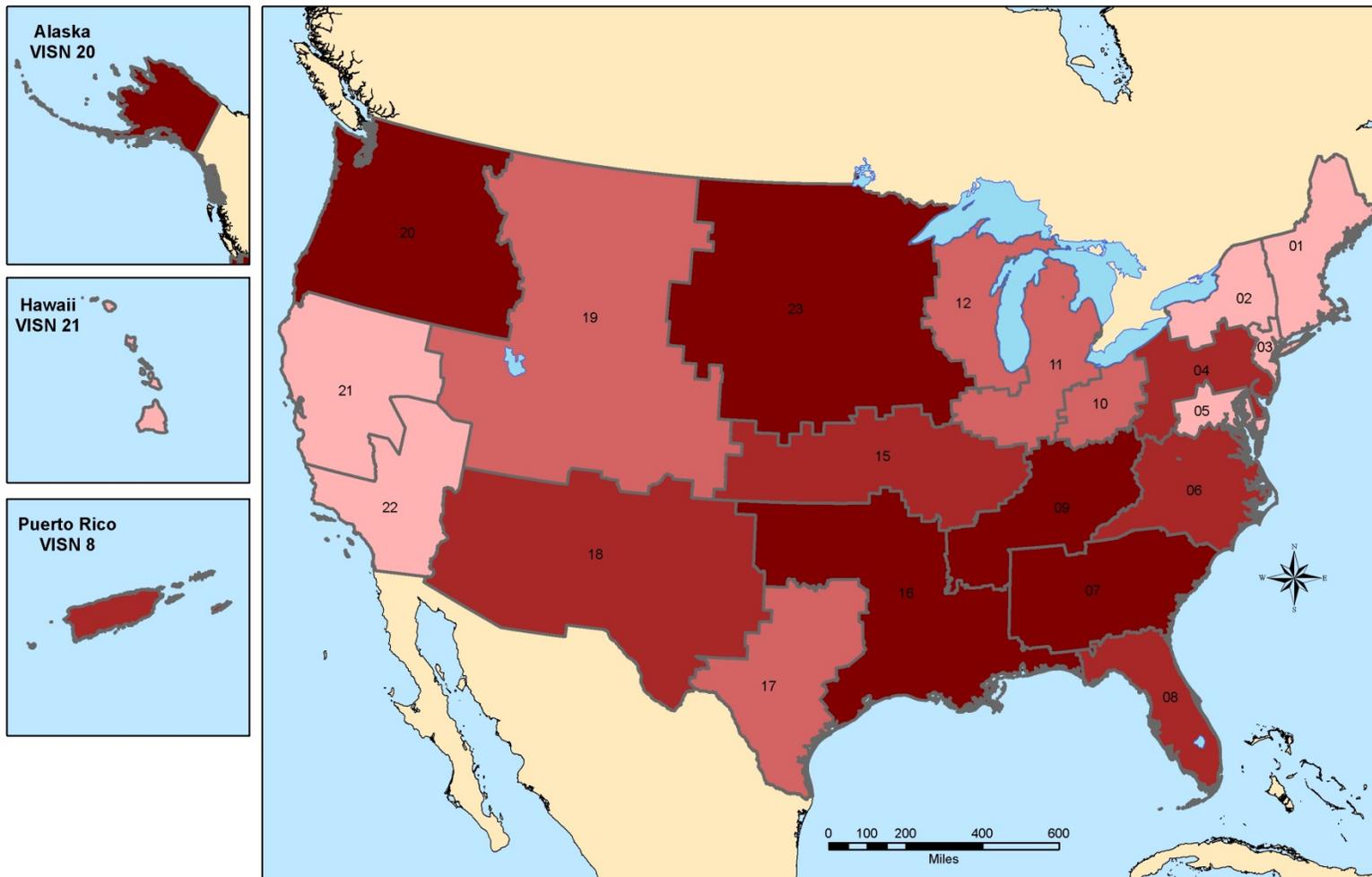
Table 3 further illustrates overall prevalence of Congestive Heart Failure in each network, broken down by gender of patient and the same rurality categories as in Table 2. For the purposes of simplicity, the percent-column adjacent to the rurality columns are a combined percentage of rural and highly rural patients, indicated in red text. Female patients in rural and highly rural areas comprised 0.74% of total number of patients with Congestive Heart Failure at the National level. In all 21 networks, around 1% or less of the total number of patients with Congestive Heart Failure were female, with the Upstate New York (VISN 2) and South Central (VISN 16) Networks in the lead. Male patients, as expected, represented a much higher percentage of total patients with Congestive Heart Failure in each network. In four networks, more than half of male patients with Congestive Heart Failure lived in rural and highly rural areas. Male patients with Congestive Heart Failure in the Midwest Network (VISN 23) comprised the highest prevalence of 62.90% of total patients with Congestive Heart Failure in that network. The New York/New Jersey Network (VISN 3) had the lowest prevalence of rural and highly rural patients with Congestive Heart Failure - both for males (5.59%) and females (0.1%). Maps 22-25 display the number and percentage of rural and highly rural female patients with Congestive Heart Failure by VISN, State, and county, with the darkest shade designating the highest quartile (25% or one-third) in terms of volume and proportion. VISNs 9 and 16 had both a high volume and high proportion (in upper 25% quartile) of rural and highly rural female patients with Congestive Heart Failure of the total rural and highly rural female patient population, as portrayed in Maps 22 and 23. Seven of the 50 U.S. States, as shown on Maps 24 and 25, had both a high volume (in upper one-third) and high proportion (in upper 25% quartile) of rural and highly rural female patients with Congestive Heart Failure of the total rural and highly rural female patient population. Those U.S. States were Louisiana, Michigan, Ohio, Oklahoma, Oregon, Tennessee, and Wisconsin.

# Congestive Heart Failure



Table 3: National and VISN Numbers and Percentages of VHA Patients with Congestive Heart Failure, by Rurality and Gender, FY-2014

Prevalence Statistics by Gender and Rurality- Congestive Heart Failure, FY-2014											
Veterans Integrated Service Network	Total Number of Patients with Congestive Heart Failure	Female					Male				
		HR	R	%	U	Unk	HR	R	%	U	Unk
New England (01)	8,437	*	57	0.68	139	*	25	2,457	29.42	5,756	3
Upstate NY (02)	4,862	*	49	1.01	81	*	3	2,286	47.08	2,444	*
NY/NJ (03)	5,797	*	6	0.10	85	*	*	323	5.59	5,382	*
VISN 04 (04)	12,217	*	84	0.69	158	*	*	4,344	35.57	7,629	*
Capitol (05)	3,872	*	20	0.52	84	*	*	937	24.20	2,830	*
Mid-Atlantic (06)	12,465	*	96	0.77	188	*	5	6,146	49.35	6,032	3
Southeast (07)	14,265	*	127	0.89	336	*	*	6,263	43.91	7,539	*
Sunshine (08)	18,013	*	87	0.48	344	*	*	3,595	19.97	13,984	*
Mid South (09)	13,614	*	134	0.98	193	*	*	7,661	56.27	5,630	*
Ohio (10)	10,129	*	71	0.70	142	*	*	3,686	36.40	6,230	*
Vets in Partnership (11)	10,782	*	80	0.74	157	*	*	4,625	42.90	5,920	*
Great Lakes (12)	10,996	*	64	0.59	154	*	23	3,498	32.02	7,253	3
Heartland (15)	11,055	*	89	0.81	123	*	104	6,111	56.22	4,628	*
South Central (16)	20,571	*	205	1.00	250	*	33	10,501	51.21	9,580	*
Heart of Texas (17)	11,063	*	78	0.72	223	*	81	4,200	38.70	6,479	3
Southwest (18)	9,112	13	69	0.90	174	*	452	2,684	34.42	5,715	4
Rocky Mtn. (19)	6,439	20	44	0.99	108	*	922	1,694	40.63	3,648	3
Northwest (20)	10,241	9	92	0.99	187	*	500	3,668	40.70	5,786	*
Sierra Pacific (21)	9,636	*	50	0.53	174	*	159	2,459	27.17	6,715	78
Desert Pacific (22)	9,657	5	21	0.27	212	*	108	839	9.81	8,474	*
Midwest (23)	13,504	13	101	0.84	109	*	807	7,687	62.90	4,789	*
<b>Grand Total</b>	<b>226,727</b>	<b>64</b>	<b>1,624</b>	<b>0.74</b>	<b>3,621</b>	<b>1</b>	<b>3,229</b>	<b>85,664</b>	<b>39.21</b>	<b>132,443</b>	<b>111</b>

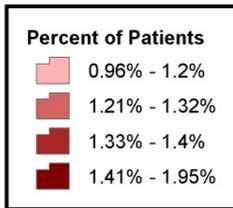
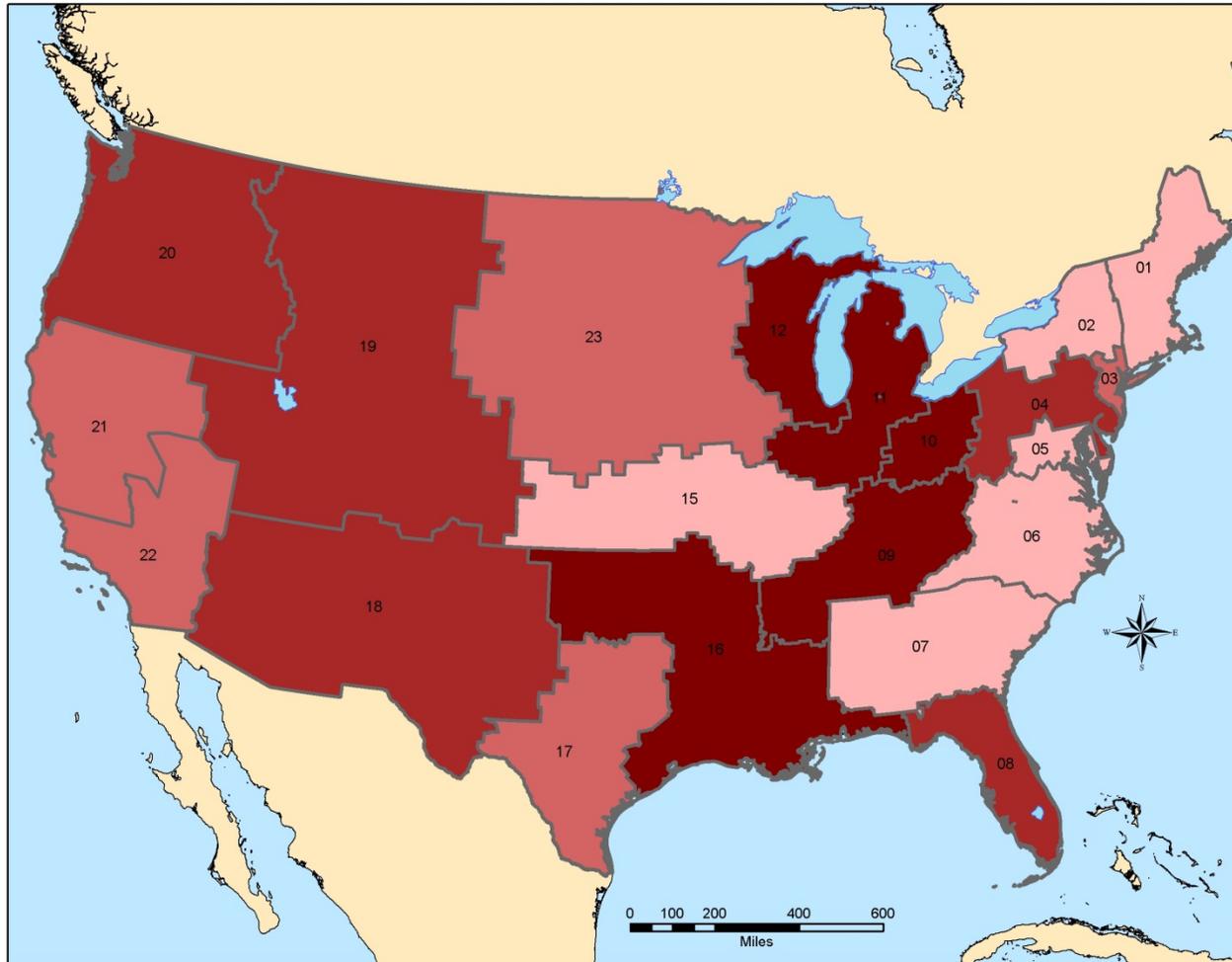


**Map 22:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Female  
By VISN FY - 2014

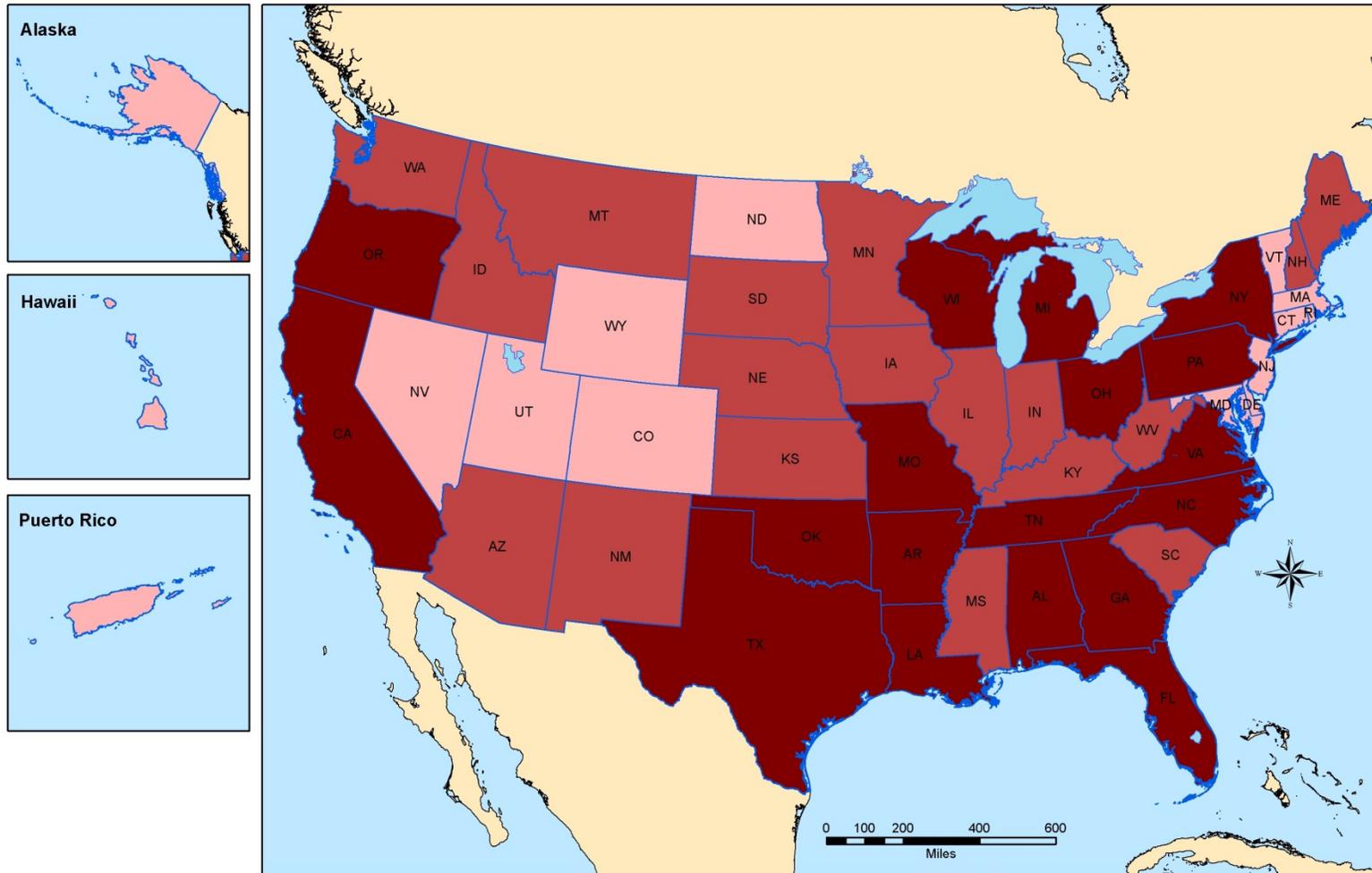


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GeoSpatial Outcomes Division  
(Map Creation Date: 8/11/2015)  
Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 23:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Female  
Of All Rural and Highly Rural VHA Patients Female  
By VISN FY - 2014



Patient Count	
<span style="display:inline-block; width:15px; height:10px; background-color:lightpink; border:1px solid black;"></span>	0 - 13 (Lower 33.3%)
<span style="display:inline-block; width:15px; height:10px; background-color:mediumslateblue; border:1px solid black;"></span>	14 - 36
<span style="display:inline-block; width:15px; height:10px; background-color:darkslateblue; border:1px solid black;"></span>	37 - 140 (Upper 33.3%)

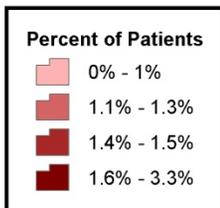
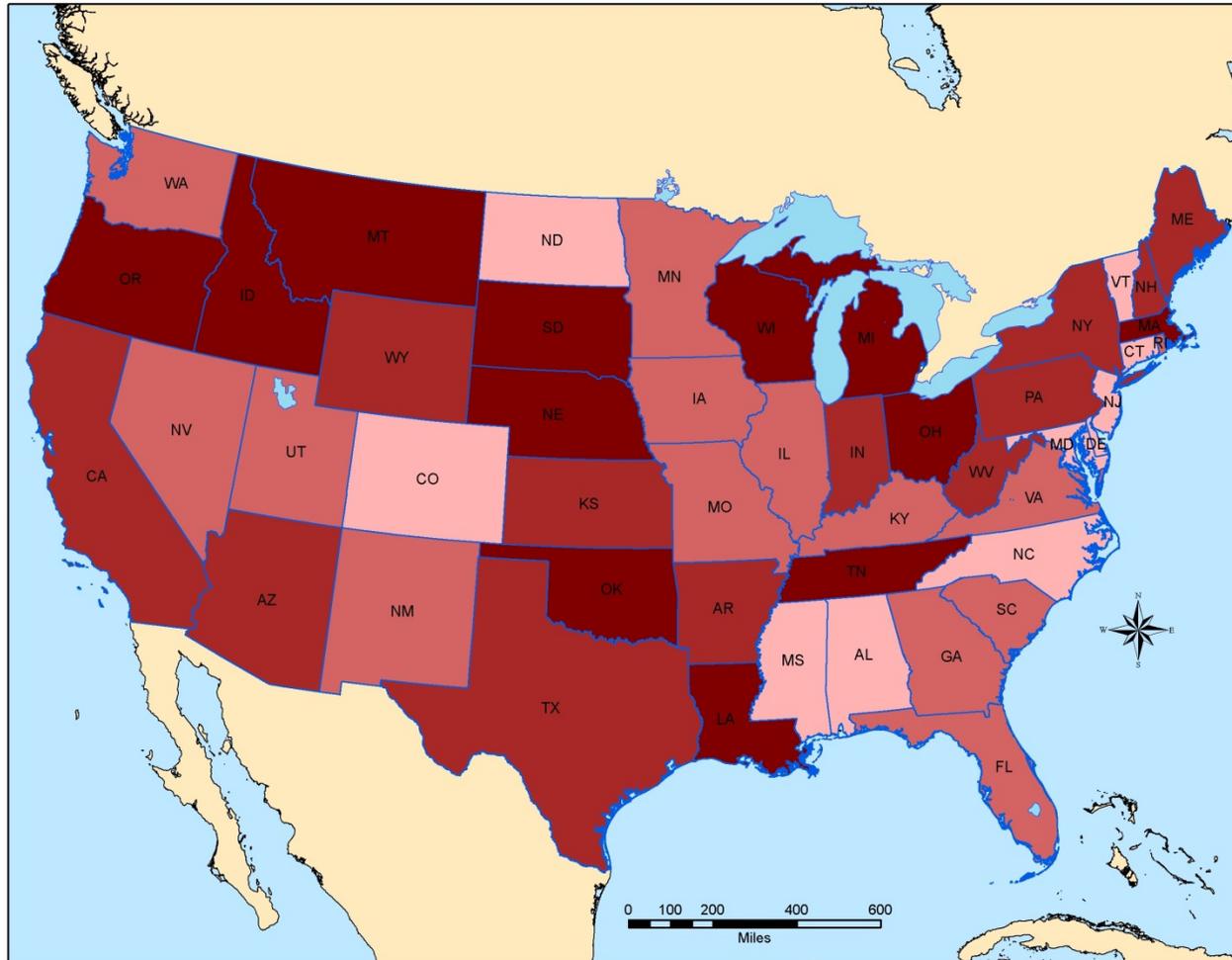
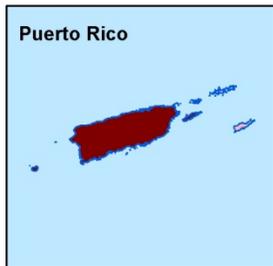
**Map 24:**

Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Female  
By State FY - 2014



Map Created By: ORH RHRC-ER (DCR, LKW, JKA, ERL)  
GeoSpatial Outcomes Division  
(Map Creation Date: 8/13/2015)  
Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 25:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Female Of All Rural and Highly Rural Patients Female By State FY - 2014

## **AGE GROUP**

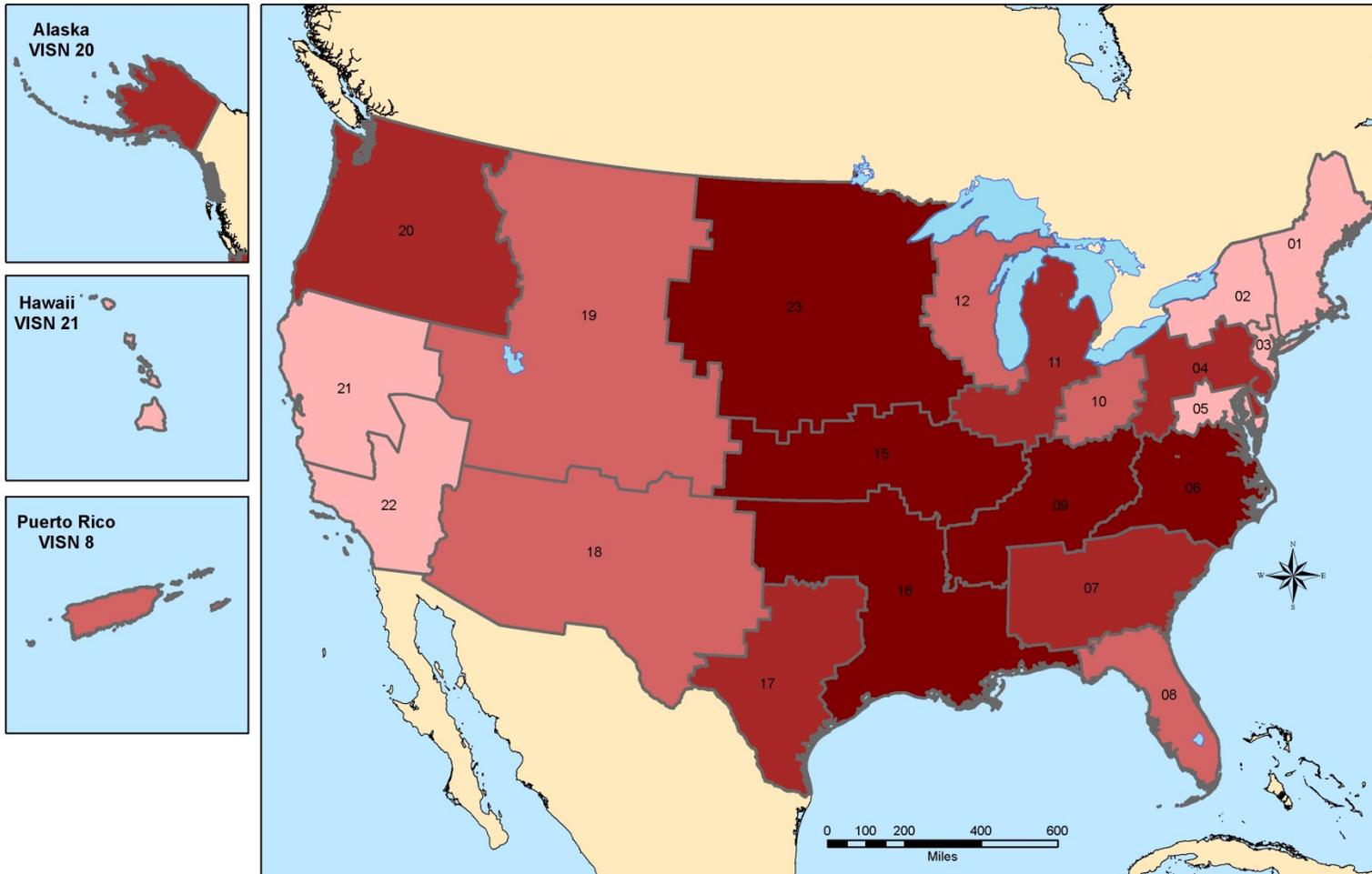
Examining the age groups of rural and highly rural patients is also of particular interest to the policy and planning community within the VHA. In Table 4, only rural and highly rural categories were included, since that is the focus, and urban and unknown categories were omitted. For simplicity's sake, the percent-column adjacent to the rurality columns are a combined percentage of rural and highly rural patients, indicated in red text. The 75+ age group, at the National level, had the highest prevalence of patients with Congestive Heart Failure in rural and highly rural areas at 17.50%. The 65-74 age group of this same cohort ranked closely behind nationally at 14.55%, while the other three age groups showed much lower proportions. The eldest two age groups showed significant prevalence in rural and highly rural areas at the network level. The Midwest Network (VISN 23) ranked highest in 75+ age group with 4,918 patients (36.42% of the total number of patients with Congestive Heart Failure in that network), while the South Central Network (VISN 16) ranked highest in the 65-74 age group with 4,059 patients (19.73% of the total number of patients with Congestive Heart Failure in that network). Across all age groups, the New York/New Jersey Network (VISN 3) had the fewest number of patients and lowest percentage of patients of rural and highly rural patients with Congestive Heart Failure of the total rural and highly rural patient population. Maps 26-31 display the number and percentage of rural and highly rural patients age 65 and over with Congestive Heart Failure by VISN, State, and county, with the highest 25% in terms of volume and proportion designated by the darkest shade. VISNs 9, 15, and 16 showed both a high volume and high proportion (in upper 25% quartile) of rural and highly rural patients age 65 and over with Congestive Heart Failure of the total rural and highly rural patient population age 65 and over, as portrayed in Maps 26 and 27. Five of the 50 U.S. States, as shown on Maps 28 and 29, had both a high volume and high proportion (in upper 25% quartile) of rural and highly rural patients age 65 and over with Congestive Heart Failure of the total rural and highly rural patient population age 65 and over. Those U.S. States were Kentucky, Ohio, Oklahoma, Tennessee, and Texas.

# Congestive Heart Failure



**Table 4: National and VISN Numbers and Percentages of VHA Patients with Congestive Heart Failure, by Rurality and Age Group, FY-2014**

Prevalence Statistics by Age Group and Rurality- Congestive Heart Failure, FY-2014																
Veterans Integrated Service Network	Total Number of Patients with Congestive Heart Failure	<45			45-54			55-64			65-74			75+		
		HR	R	%	HR	R	%	HR	R	%	HR	R	%	HR	R	%
New England (01)	8,437	*	7	0.08	*	53	0.64	6	297	3.59	7	819	9.79	11	1,338	15.99
Upstate NY (02)	4,862	*	9	0.19	*	54	1.11	*	315	6.48	*	762	15.67	3	1,195	24.64
NY/NJ (03)	5,797	*	0	0.00	*	6	0.10	*	55	0.95	*	84	1.45	*	184	3.19
Stars and Stripes (04)	12,217	*	11	0.09	*	85	0.70	*	528	4.32	*	1,518	12.43	*	2,286	18.72
Capitol (05)	3,872	*	7	0.18	*	31	0.80	*	148	3.82	*	312	8.06	*	459	11.85
Mid-Atlantic (06)	12,465	*	37	0.30	*	223	1.80	*	1,209	9.70	3	2,354	18.91	*	2,419	19.41
Southeast (07)	14,265	*	67	0.47	*	280	1.96	*	1,330	9.32	*	2,456	17.22	*	2,257	15.82
Sunshine (08)	18,013	*	17	0.10	*	125	0.69	*	637	3.54	*	1,324	7.36	*	1,583	8.79
Mid South (09)	13,614	*	52	0.38	*	277	2.03	*	1,442	10.59	*	3,048	22.39	*	2,979	21.88
Ohio (10)	10,129	*	13	0.13	*	115	1.14	*	677	6.69	*	1,450	14.32	*	1,503	14.84
Vets in Partnership (11)	10,782	*	22	0.20	*	153	1.42	*	770	7.14	*	1,807	16.76	*	1,953	18.12
Great Lakes (12)	10,996	*	14	0.13	*	74	0.67	5	502	4.61	10	1,248	11.44	9	1,724	15.76
Heartland (15)	11,055	*	20	0.18	*	153	1.40	13	1,059	9.70	31	2,148	19.71	58	2,823	26.06
South Central (16)	20,571	*	75	0.36	*	334	1.62	8	1,969	9.61	16	4,043	19.73	9	4,286	20.88
Heart of Texas (17)	11,063	*	24	0.22	*	117	1.07	14	785	7.22	34	1,740	16.04	34	1,612	14.88
Southwest (18)	9,112	3	18	0.23	9	65	0.81	78	445	5.74	163	1,028	13.07	212	1,198	15.47
Rocky Mtn. (19)	6,439	3	6	0.14	14	34	0.75	115	251	5.68	340	603	14.65	470	844	20.41
Northwest (20)	10,241	*	17	0.18	5	90	0.93	78	609	6.71	215	1,509	16.83	210	1,535	17.04
Sierra Pacific (21)	9,636	*	8	0.09	5	53	0.60	19	380	4.14	71	926	10.35	64	1,142	12.52
Desert Pacific (22)	9,657	*	4	0.04	*	24	0.26	23	165	1.95	46	348	4.08	43	319	3.75
Midwest (23)	13,504	*	16	0.13	12	132	1.07	80	928	7.46	245	2,276	18.67	481	4,437	36.42
<b>Grand Total</b>	<b>226,727</b>	<b>11</b>	<b>444</b>	<b>0.20</b>	<b>51</b>	<b>2,478</b>	<b>1.12</b>	<b>440</b>	<b>14,501</b>	<b>6.59</b>	<b>1,183</b>	<b>31,803</b>	<b>14.55</b>	<b>1,608</b>	<b>38,076</b>	<b>17.50</b>



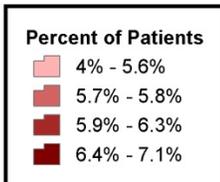
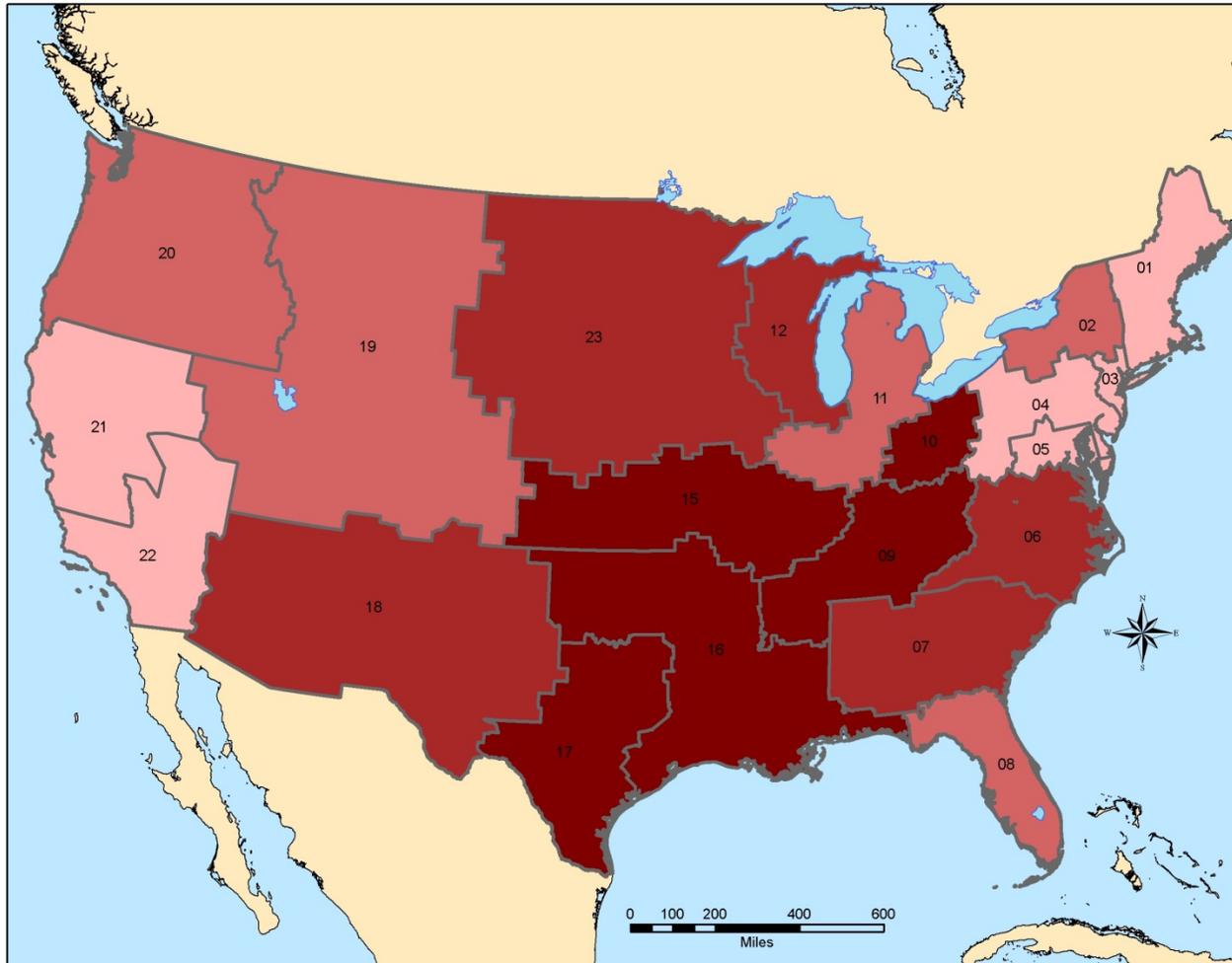
Patient Count	
269 - 2,203	(Lower 25%)
2,204 - 2,991	
2,992 - 4,714	
4,715 - 8,354	(Upper 25%)

**Map 26:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Age 65 and Over  
By VISN FY - 2014

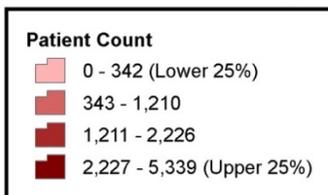
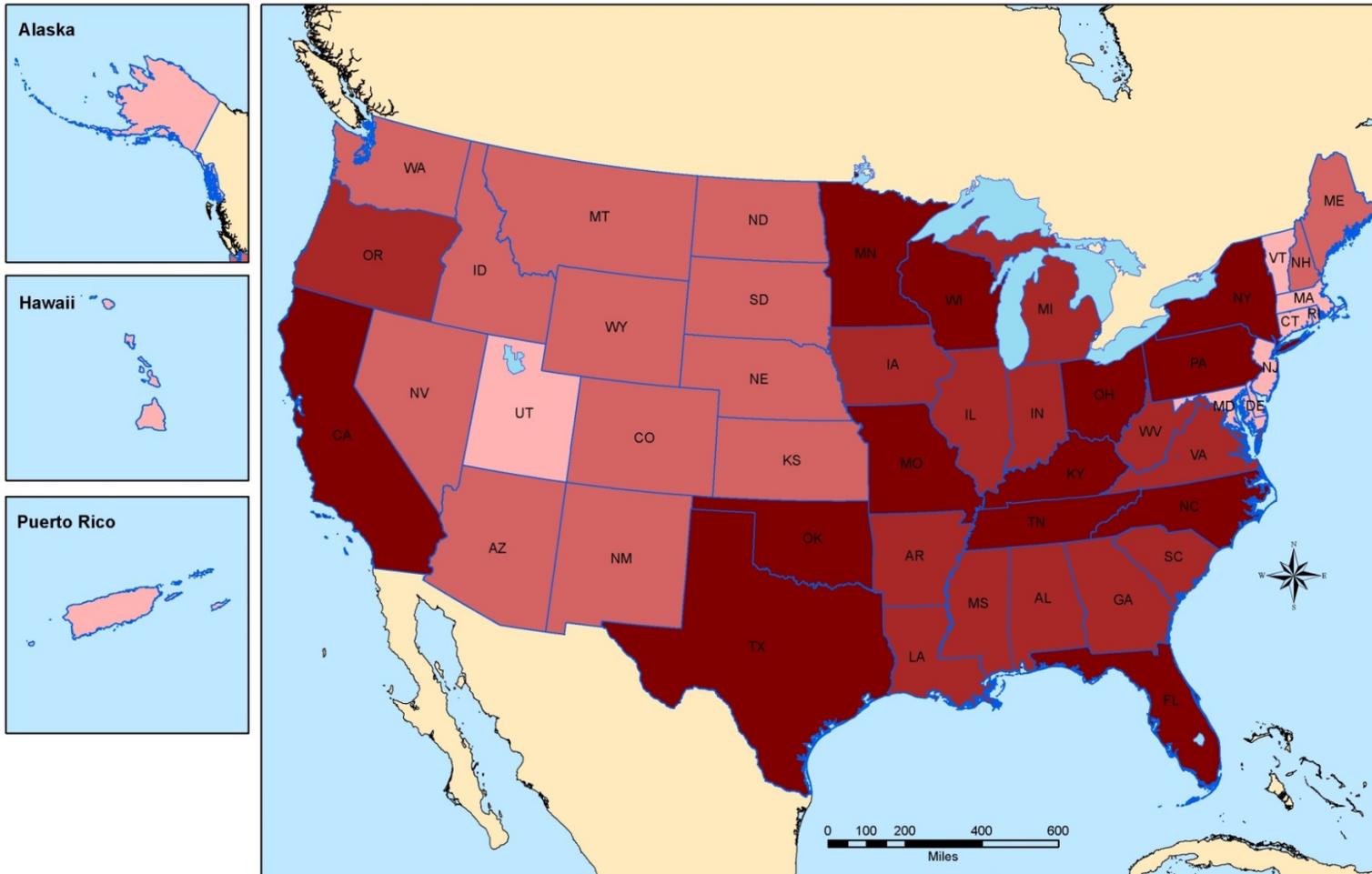


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# Congestive Heart Failure



**Map 27:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Age 65 and Over Of All Rural and Highly Rural VHA Patients Age 65 and Over By VISN FY - 2014

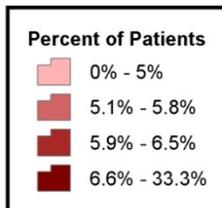
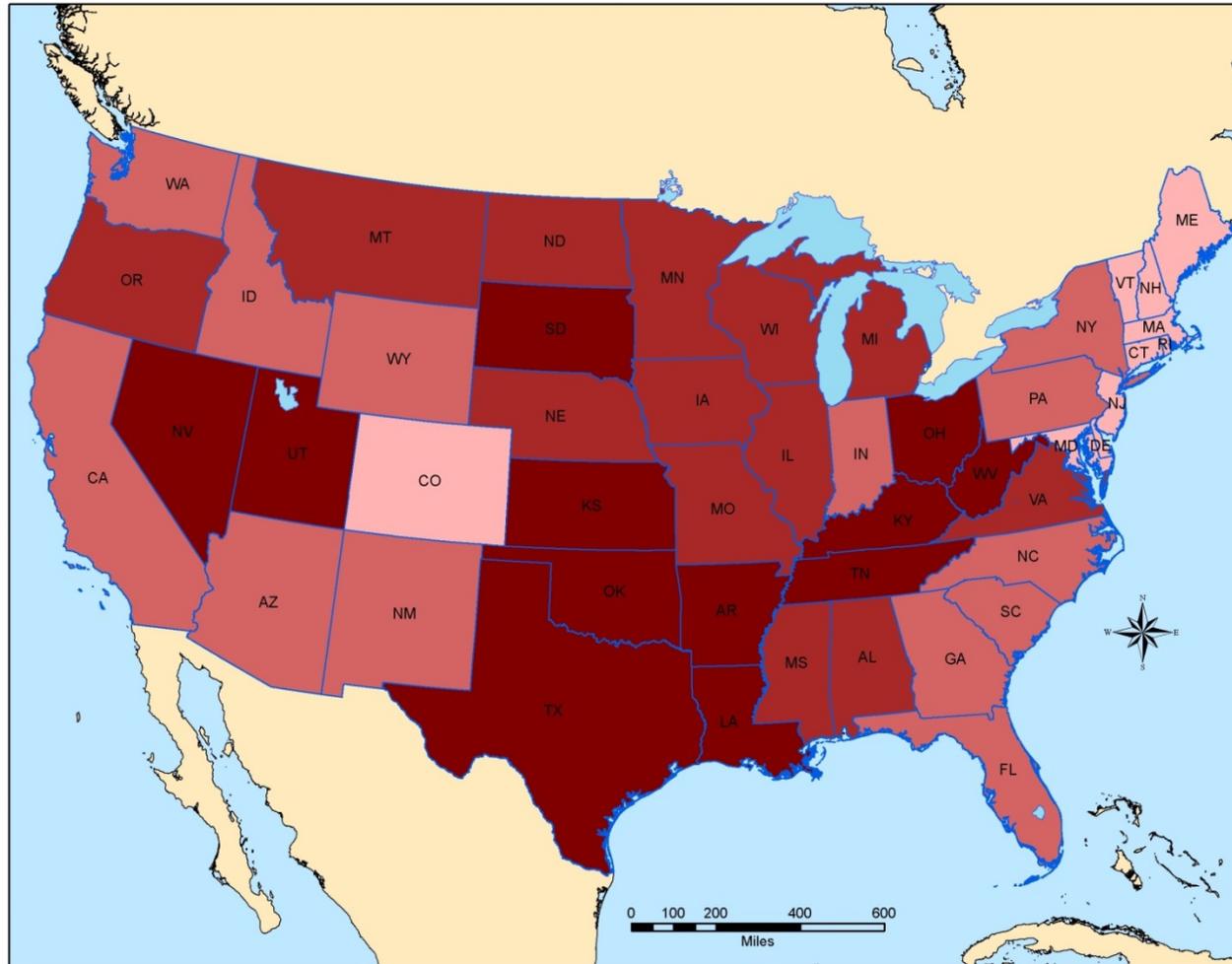


**Map 28:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Age 65 and Over  
By State FY - 2014

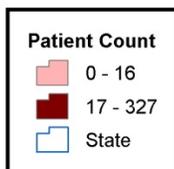
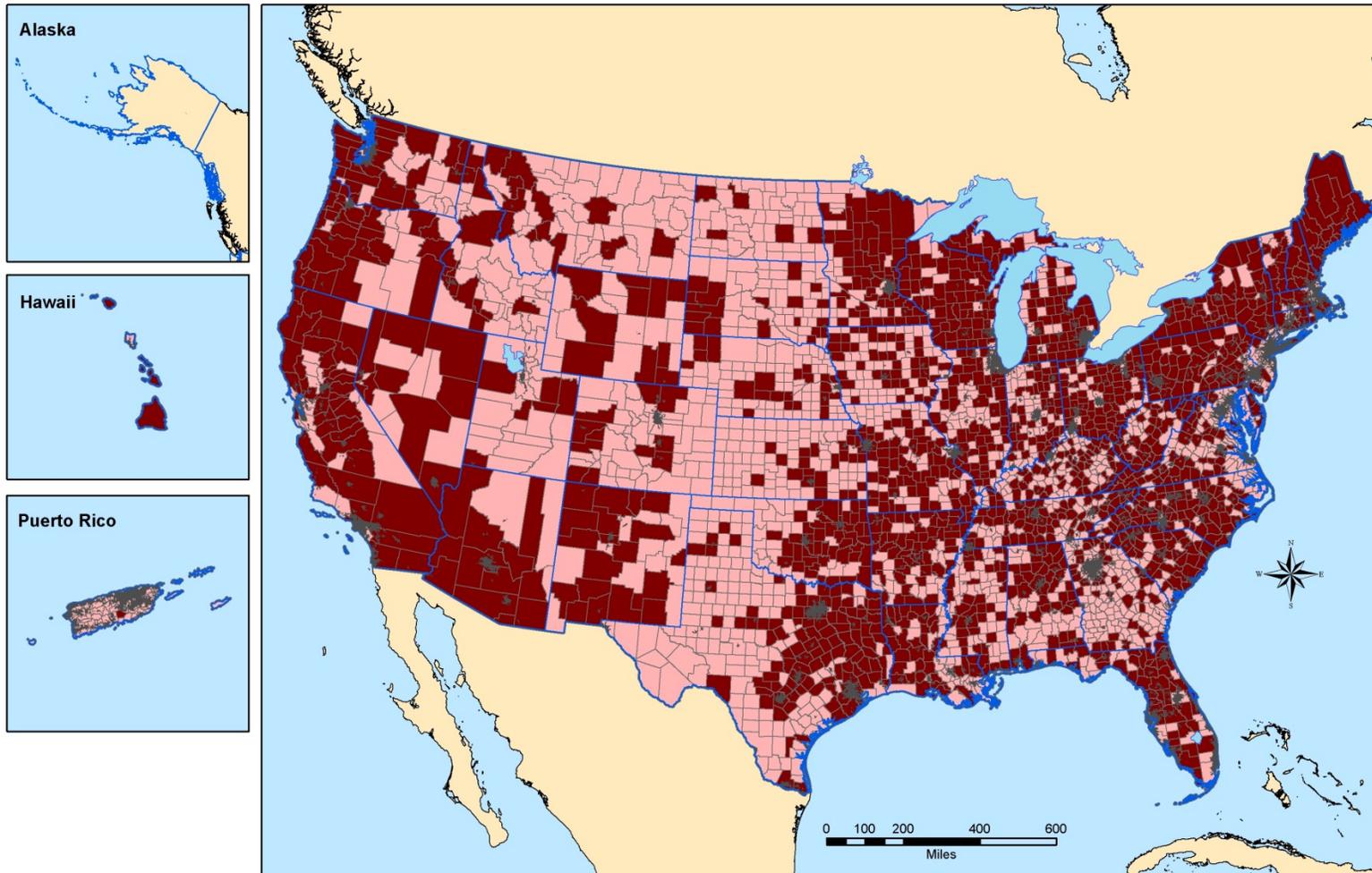


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Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 29:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Age 65 and Over Of All Rural and Highly Rural Patients Age 65 and Over By State FY - 2014

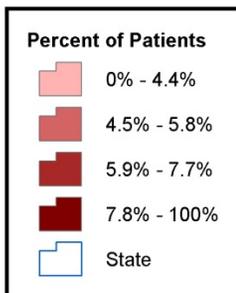
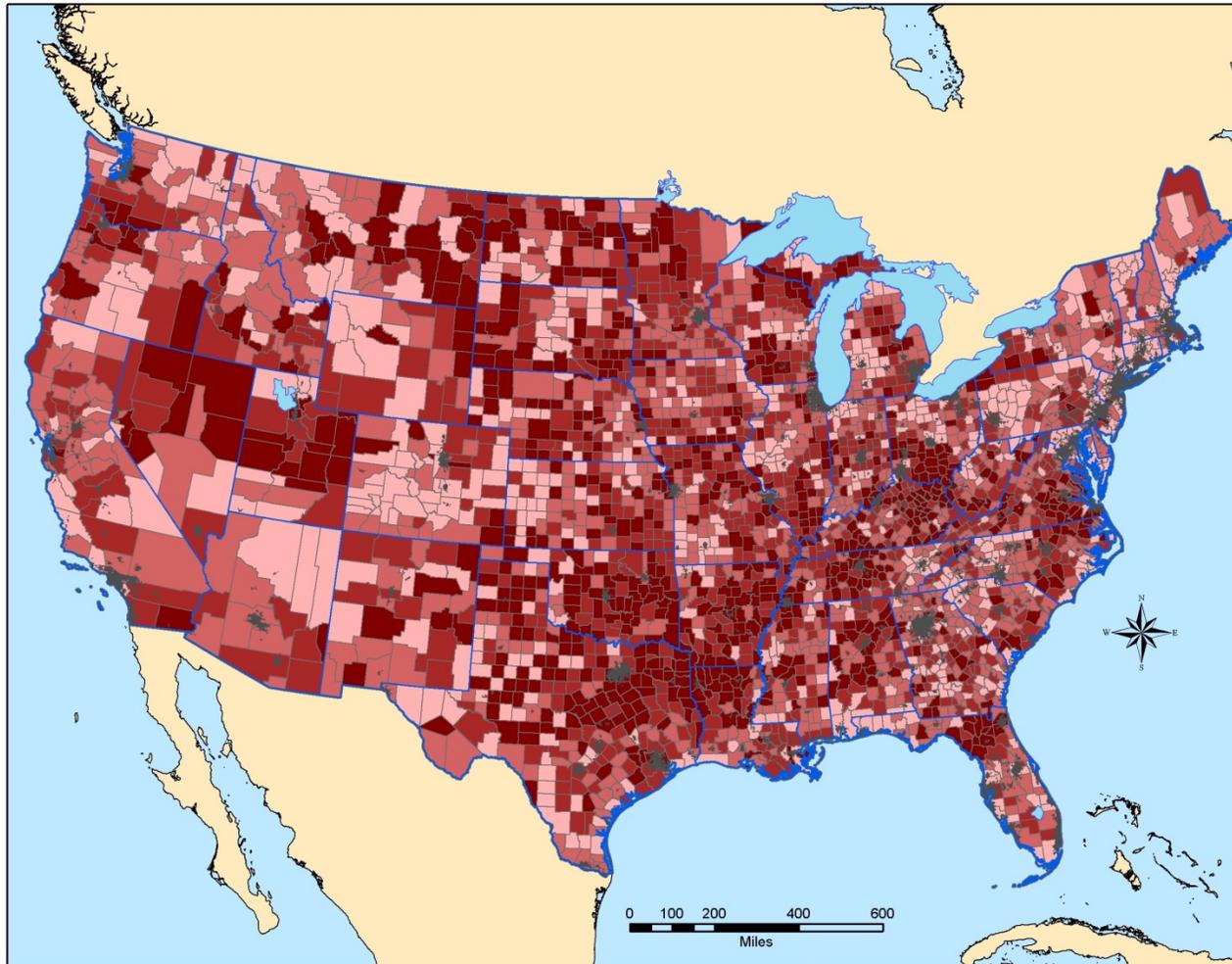
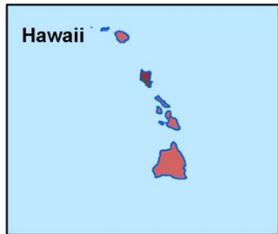


**Map 30:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Age 65 and Over  
By County FY - 2014  
Urban Areas "Shaded"



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# Congestive Heart Failure



**Map 31:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Age 65 and Over Of All Rural and Highly Rural Patients Age 65 and Over By County FY - 2014  
Urban Areas "Shaded"

**SERVICE CONNECTION AND LOW INCOME ENROLLMENT PRIORITY GROUPS**

Table 5 examines selected enrollment priority groups and what percentage of those patients resided in rural and highly rural areas. At the National level, rural and highly rural patients with Congestive Heart Failure with a service-connected disability represented 17.77% of the total number of patients with Congestive Heart Failure in the VHA. At the network level, the South Central Network (VISN 16) ranked the highest with 4,977 rural and highly rural service-connected patients with Congestive Heart Failure. However, the Midwest Network (VISN 23) ranked the highest at 30.58%, in terms of proportion of rural and highly rural service-connected patients with Congestive Heart Failure to all patients with Congestive Heart Failure. Maps 32-37 display the number and percentage of rural and highly rural patients with a service-connected disability with Congestive Heart Failure by VISN, State, and county, with the highest 25% in terms of volume and proportion designated by the darkest shade.

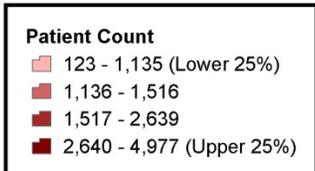
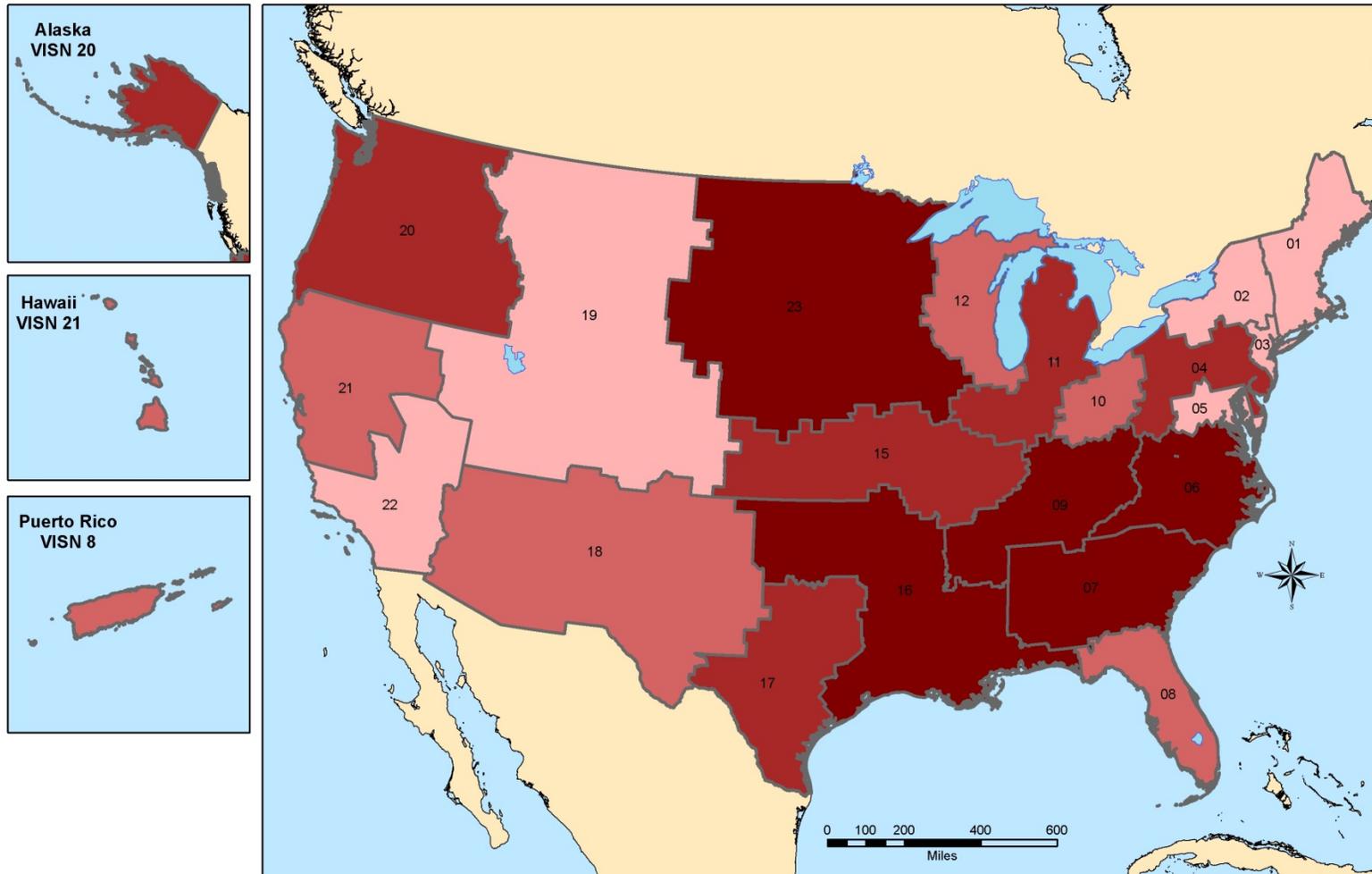
Patients with Congestive Heart Failure residing in rural and highly rural areas who were Priority Group 5 represented 11.69% of the total patient population with Congestive Heart Failure across the United States. The South Central Network (VISN 16) again ranked the highest with 3,279 rural and highly rural low-income/non-Service Connected/non-compensable Service-Connected patients with Congestive Heart Failure. The Mid South Network (VISN 9) had the highest proportion at 17.67%. Maps 38-43 display the number and percentage of rural and highly rural patients in Priority Group 5 with Congestive Heart Failure by VISN, State, and county, with the highest 25% in terms of volume and proportion designated by the darkest shade.

# Congestive Heart Failure



**Table 5: National and VISN Numbers and Percentages of VHA Patients with Congestive Heart Failure, by Rurality and Enrollment Priority Group, FY-2014**

Prevalence Statistics by Service Connection Type and Low Income by Rurality- Congestive Heart Failure, FY-2014											
Veterans Integrated Service Network	Total Number of Patients with Congestive Heart Failure	Service Connected Priority 1-3					Low Income				
		HR	R	%	U	Unk	HR	R	%	U	Unk
New England (01)	8,437	15	1,120	13.45	2,586	*	6	645	7.72	1,503	*
Upstate NY (02)	4,862	*	882	18.14	912	*	*	761	15.69	785	*
NY/NJ (03)	5,797	*	123	2.12	2,013	*	*	87	1.52	1,693	*
Stars and Stripes (04)	12,217	*	1,595	13.06	2,729	*	*	1,328	10.88	2,216	*
Capitol (05)	3,872	*	354	9.14	1,118	*	*	326	8.42	1,063	*
Mid-Atlantic (06)	12,465	3	2,962	23.79	2,964	*	*	1,903	15.27	1,744	*
Southeast (07)	14,265	*	3,021	21.18	3,807	*	*	1,852	12.98	2,230	*
Sunshine (08)	18,013	*	1,493	8.29	6,007	*	*	1,191	6.62	4,231	*
Mid South (09)	13,614	*	3,644	26.77	2,529	*	*	2,405	17.67	1,809	*
Ohio (10)	10,129	*	1,516	14.97	2,310	*	*	1,239	12.24	2,127	*
Vets in Partnership (11)	10,782	*	2,094	19.43	2,472	*	*	1,371	12.72	2,012	*
Great Lakes (12)	10,996	8	1,432	13.10	2,366	*	7	957	8.77	2,335	*
Heartland (15)	11,055	30	2,609	23.87	1,891	*	28	1,841	16.91	1,496	*
South Central (16)	20,571	19	4,958	24.19	4,582	*	6	3,273	15.94	2,896	*
Heart of Texas (17)	11,063	41	2,042	18.83	3,442	*	28	1,259	11.63	1,764	*
Southwest (18)	9,112	187	1,206	15.29	2,743	*	177	843	11.19	1,718	*
Rocky Mtn. (19)	6,439	362	734	17.02	1,668	*	279	482	11.82	1,043	*
Northwest (20)	10,241	219	1,841	20.12	2,893	*	175	1,072	12.18	1,658	*
Sierra Pacific (21)	9,636	75	1,141	12.62	3,105	52	48	734	8.12	2,071	18
Desert Pacific (22)	9,657	56	380	4.51	3,774	*	32	278	3.21	2,778	*
Midwest (23)	13,504	353	3,776	30.58	2,469	*	197	1,669	13.82	1,092	*
<b>Grand Total</b>	<b>226,727</b>	<b>1,371</b>	<b>38,923</b>	<b>17.77</b>	<b>58,380</b>	<b>56</b>	<b>990</b>	<b>25,516</b>	<b>11.69</b>	<b>40,264</b>	<b>22</b>

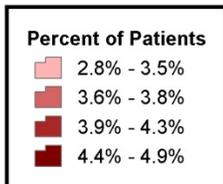
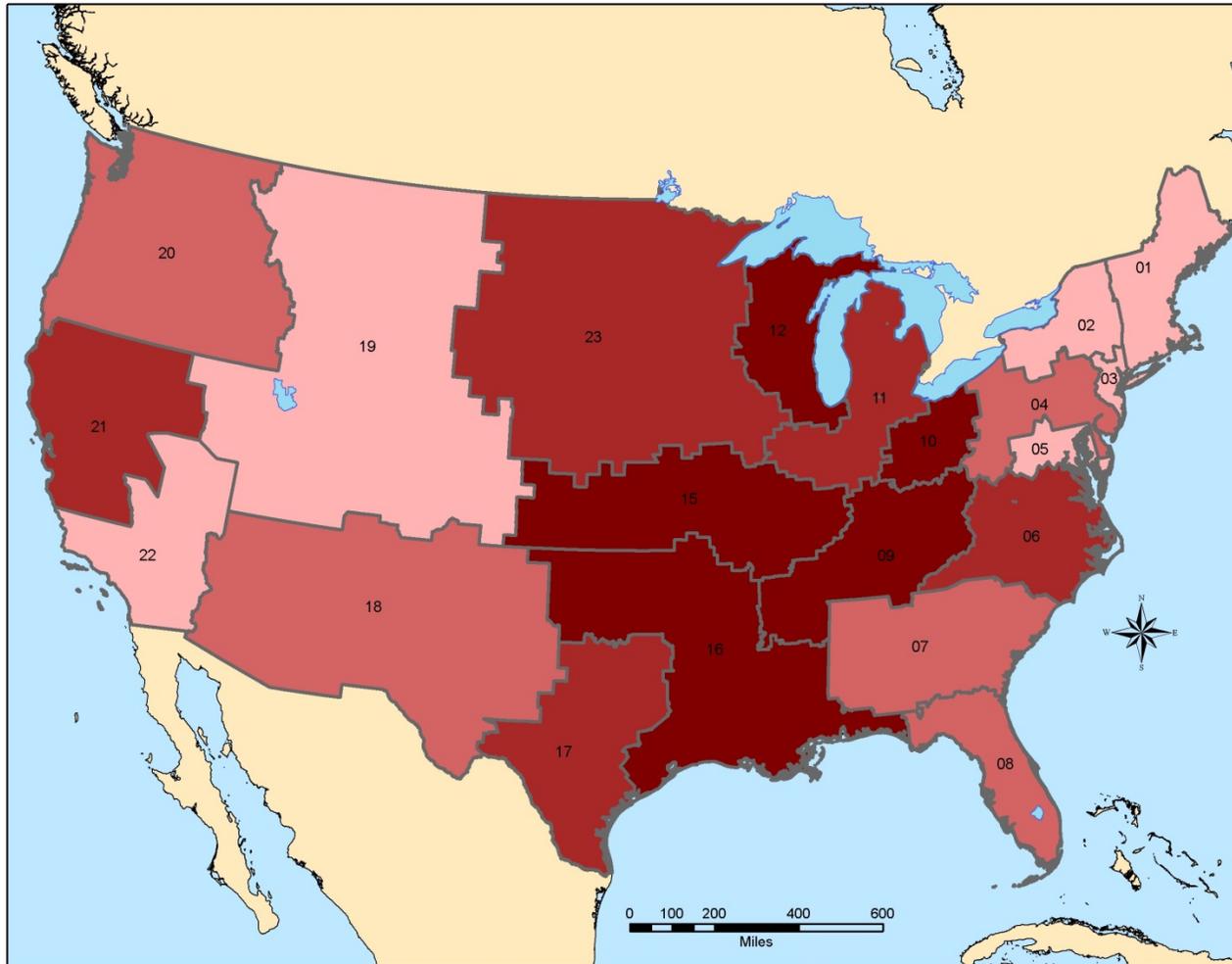


**Map 32:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Priority 1-3  
By VISN FY - 2014

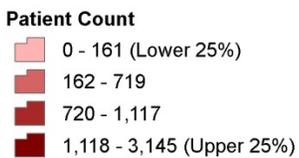
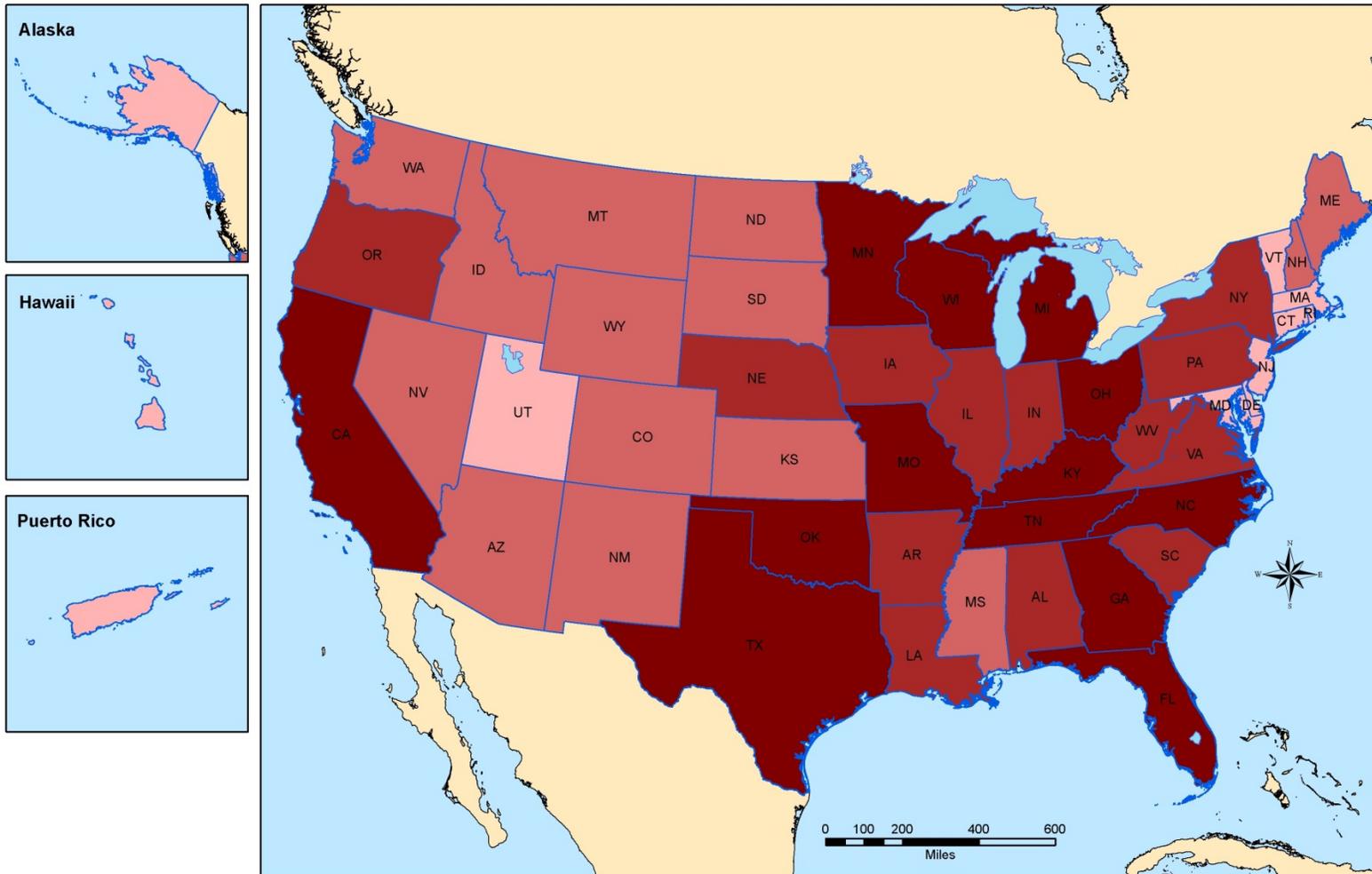
 **GeoSpatial  
Outcomes Division**  
VHA Office of Rural Health

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# Congestive Heart Failure



**Map 33:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Priority 1-3 Of All Rural and Highly Rural VHA Patients Priority 1-3 By VISN FY - 2014



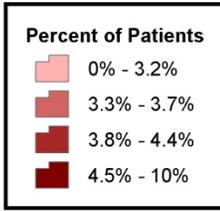
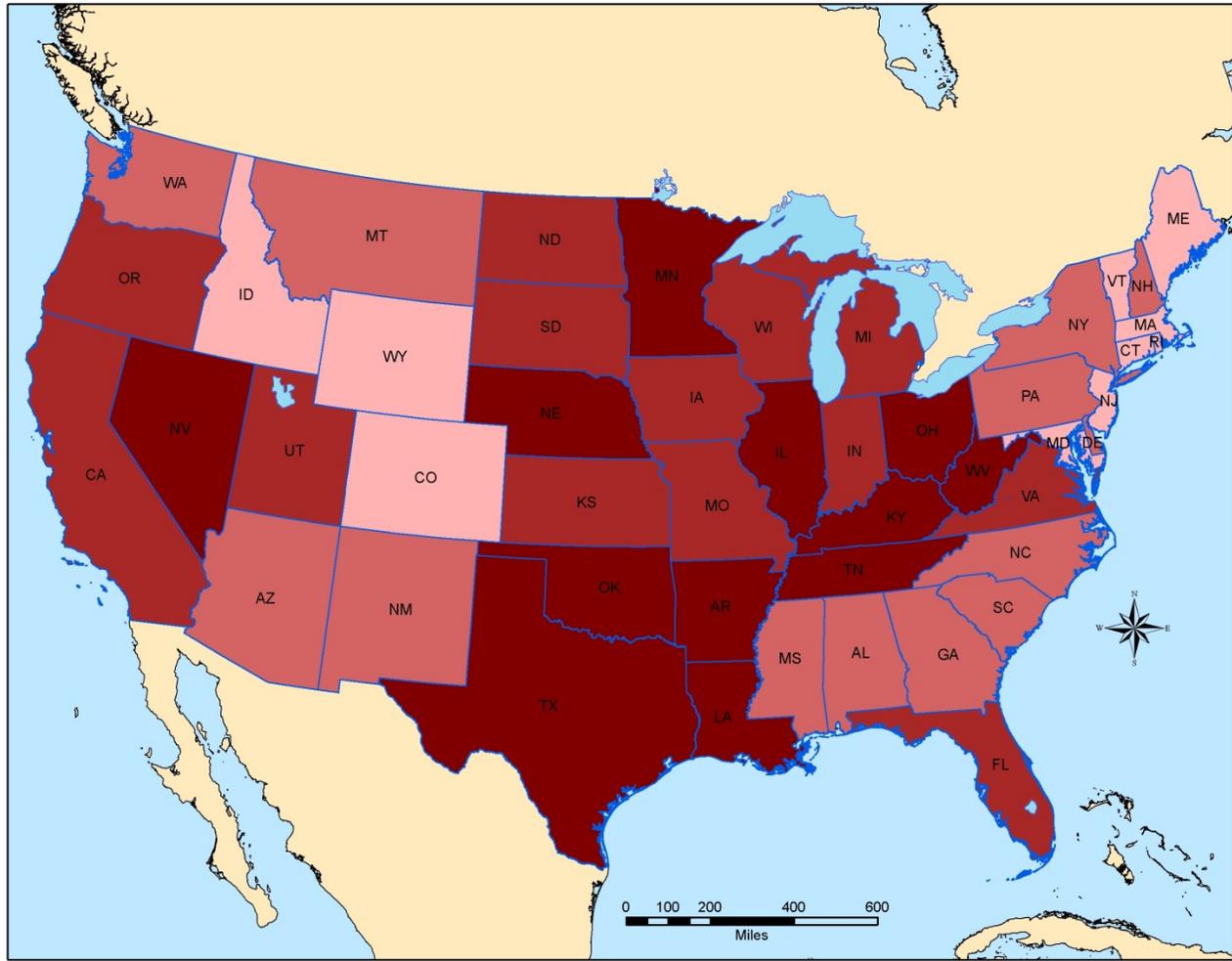
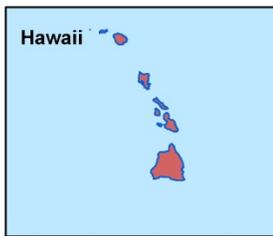
**Map 34:**

Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Priority 1-3  
By State FY - 2014

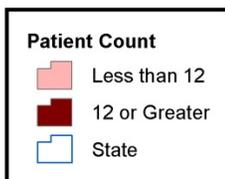
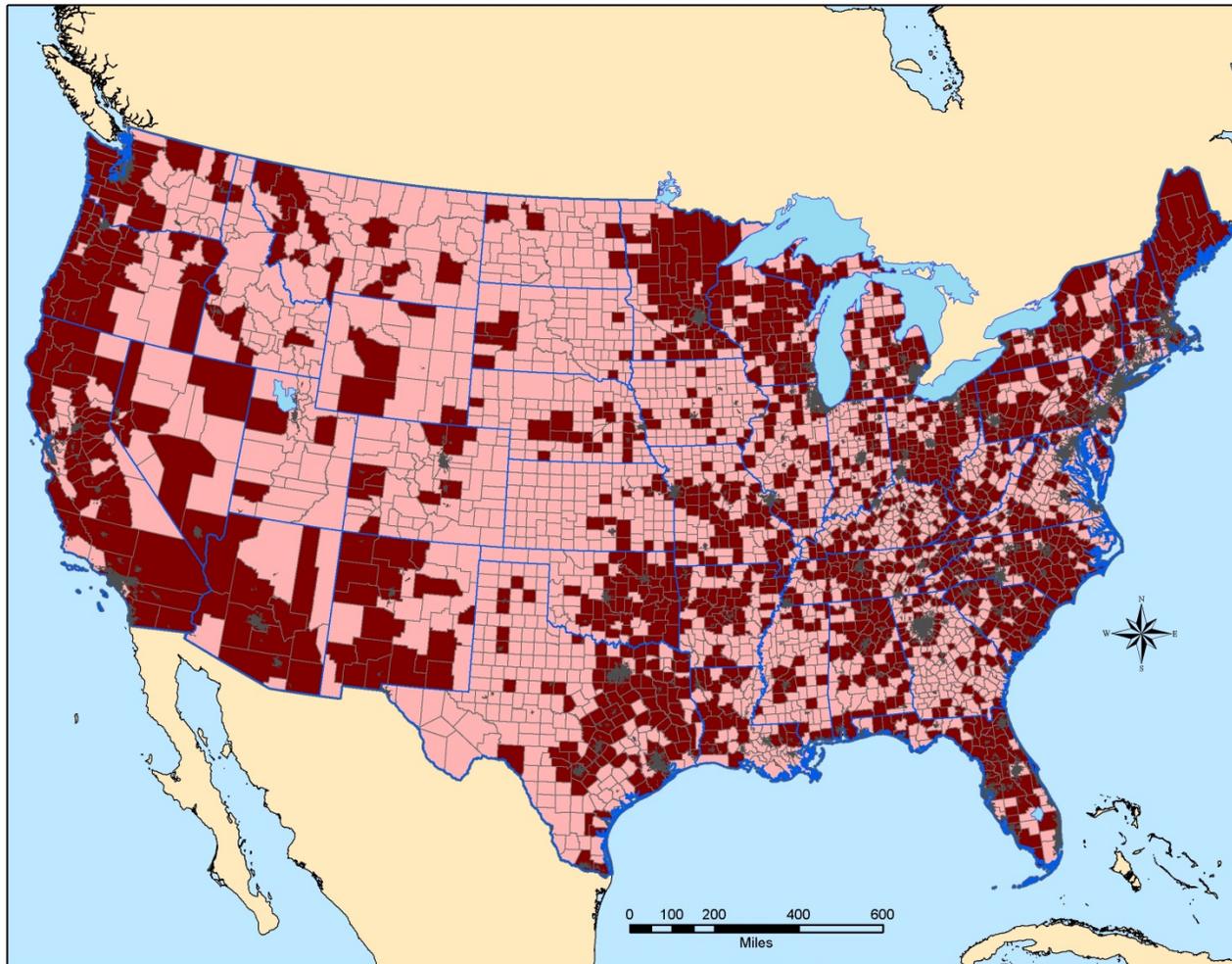
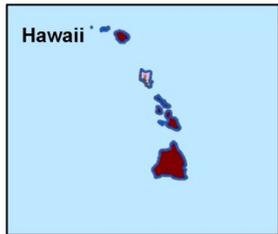


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# Congestive Heart Failure



**Map 35:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Priority 1-3  
Of All Rural and Highly Rural Patients Priority 1-3  
By State FY - 2014

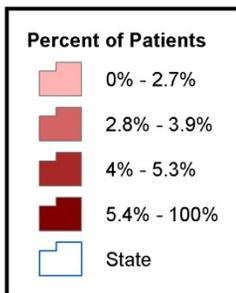
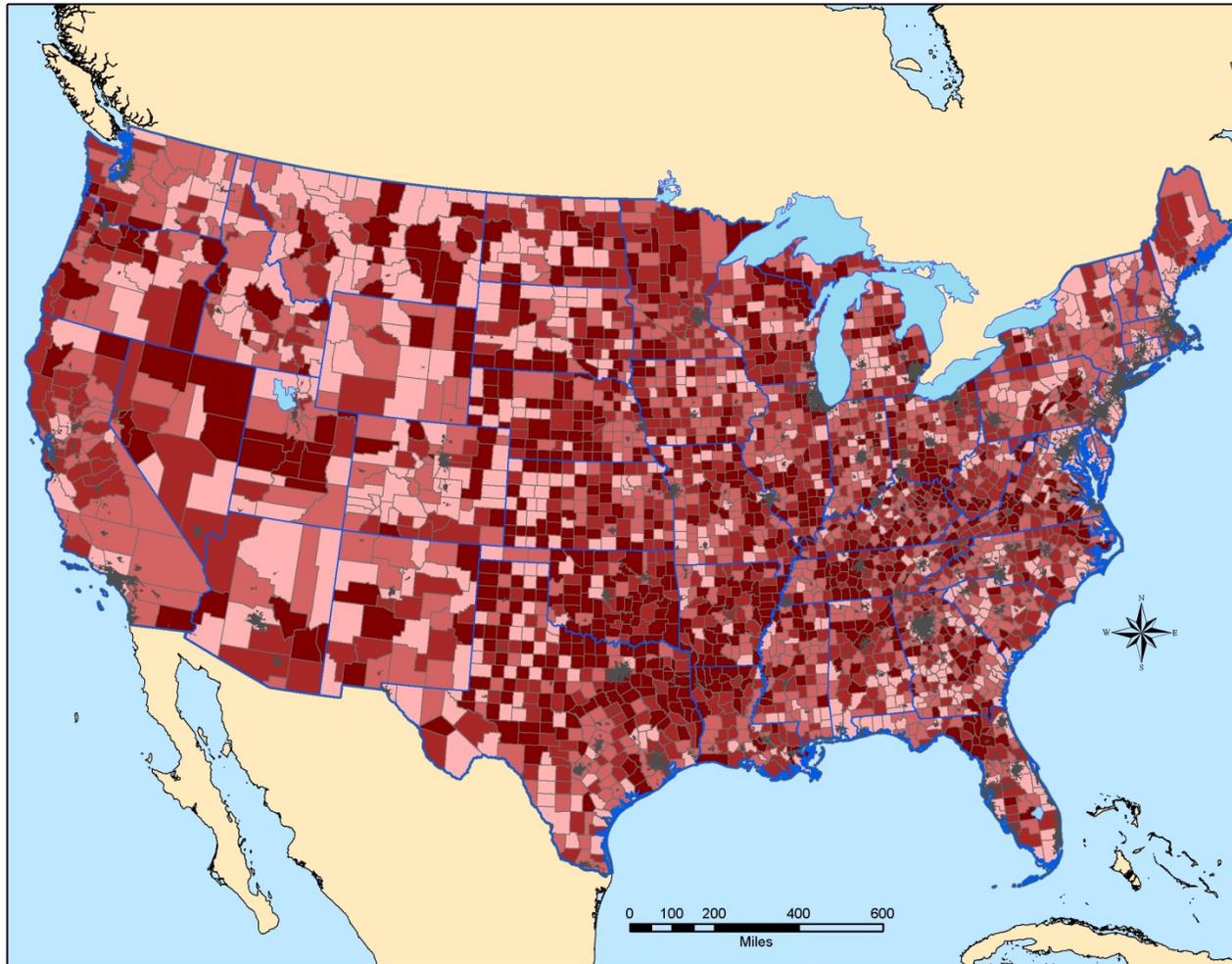


**Map 36:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Priority 1-3  
By County FY - 2014  
Urban Areas "Shaded"

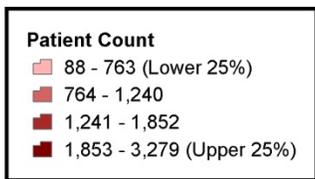
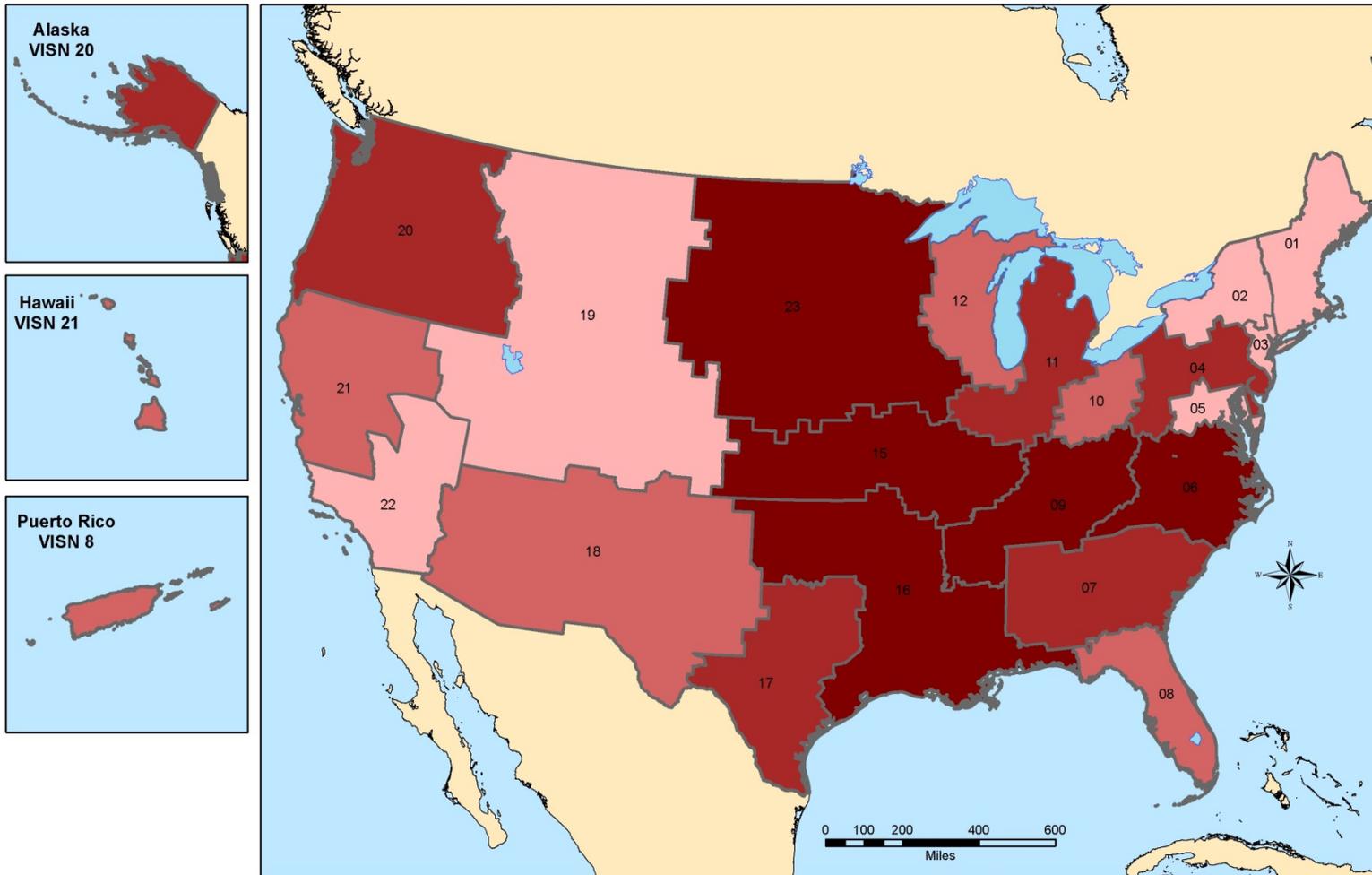


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(Map Creation Date: 8/12/2015)  
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# Congestive Heart Failure



**Map 37:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Priority 1-3 Of All Rural and Highly Rural Patients Priority 1-3 By County FY - 2014  
Urban Areas "Shaded"

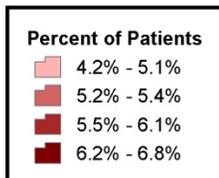
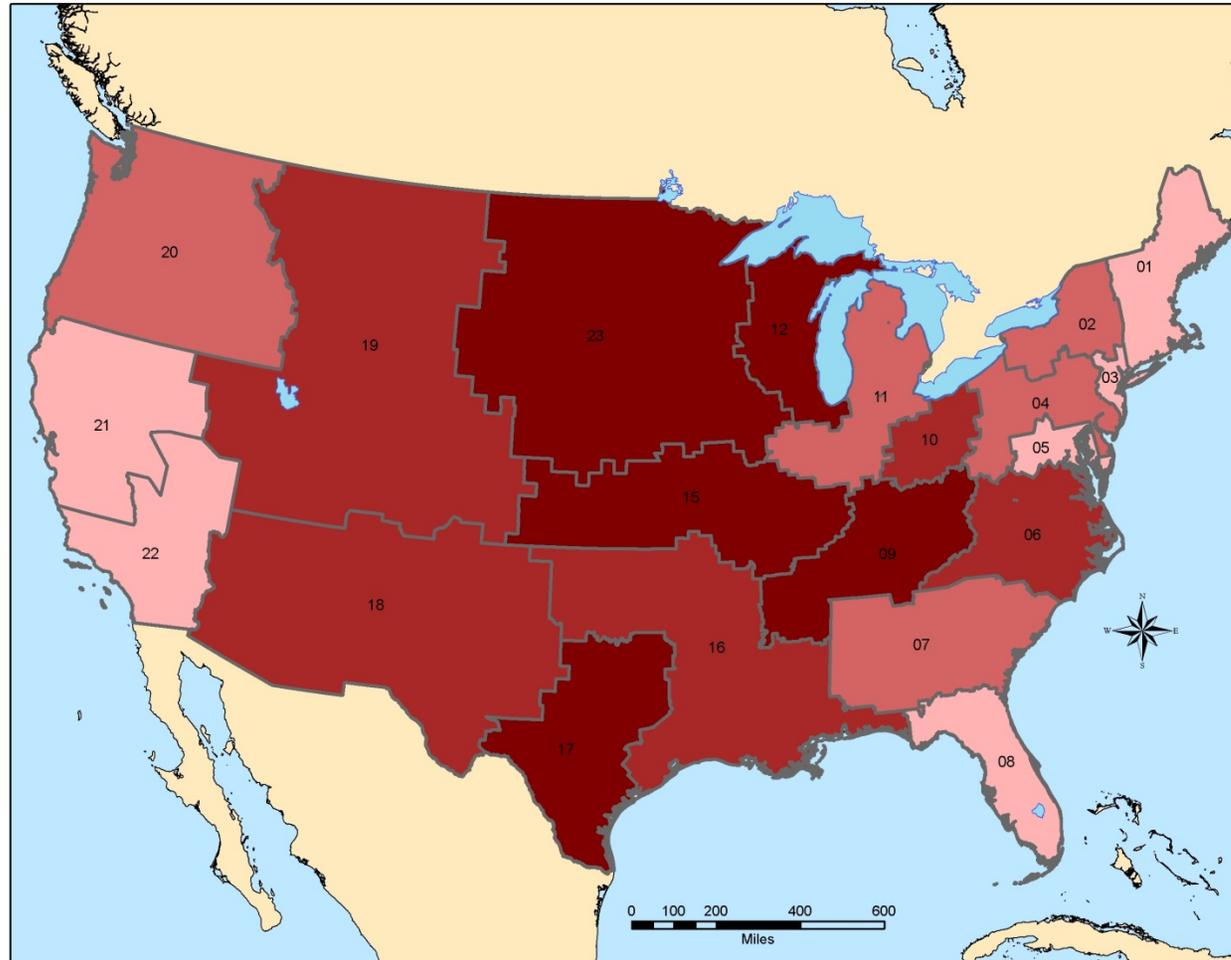


**Map 38:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure, Priority 5  
By VISN FY - 2014

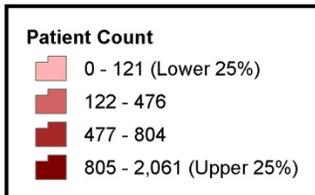
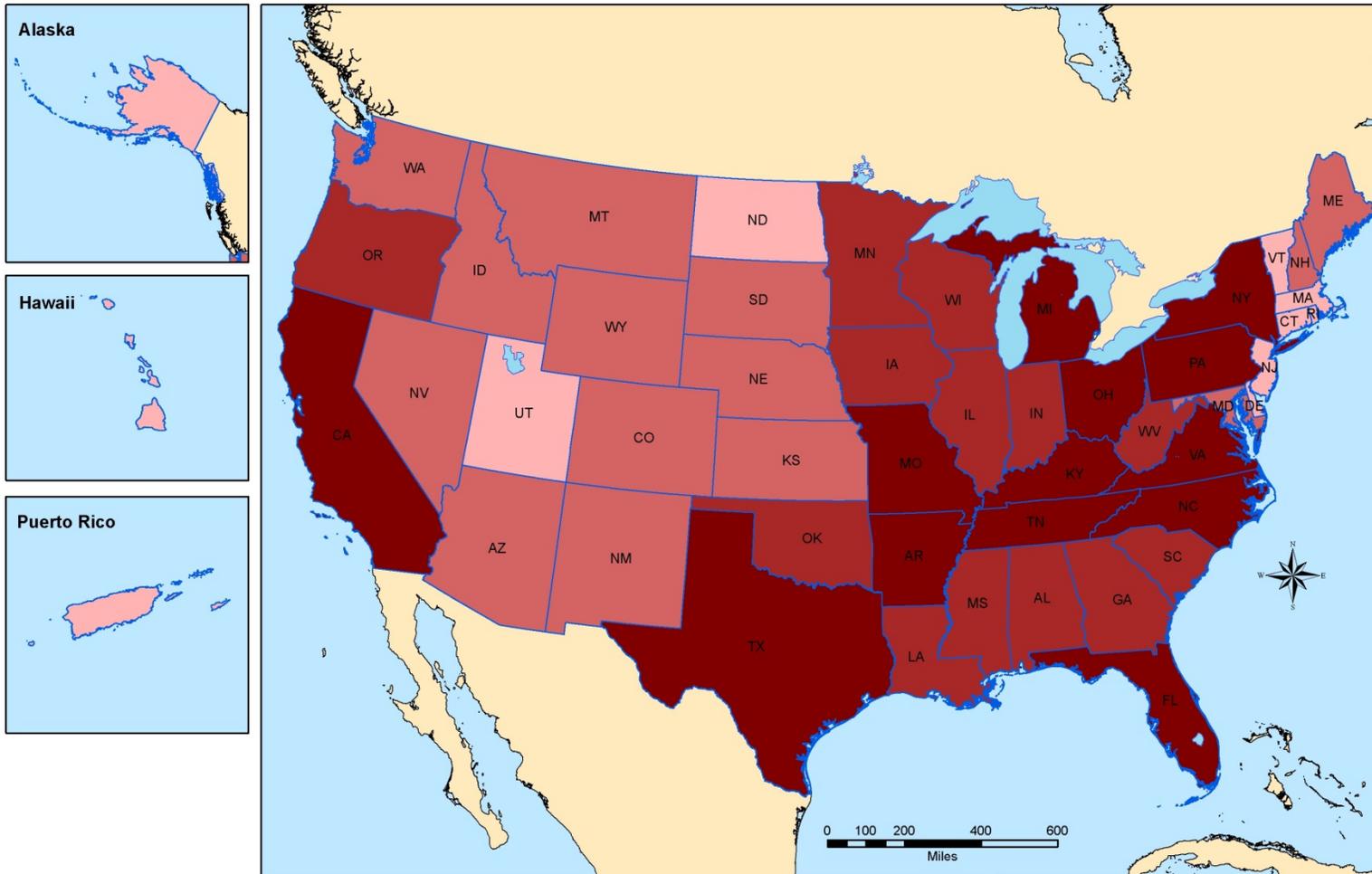


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(Map Creation Date: 8/11/2015)  
Map Information by: PSSG, VSSC, ESRI  
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# Congestive Heart Failure



**Map 39:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Priority 5 Of All Rural and Highly Rural VHA Patients Priority 5 By VISN FY - 2014

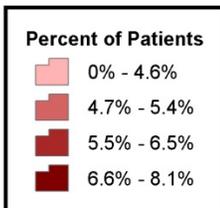
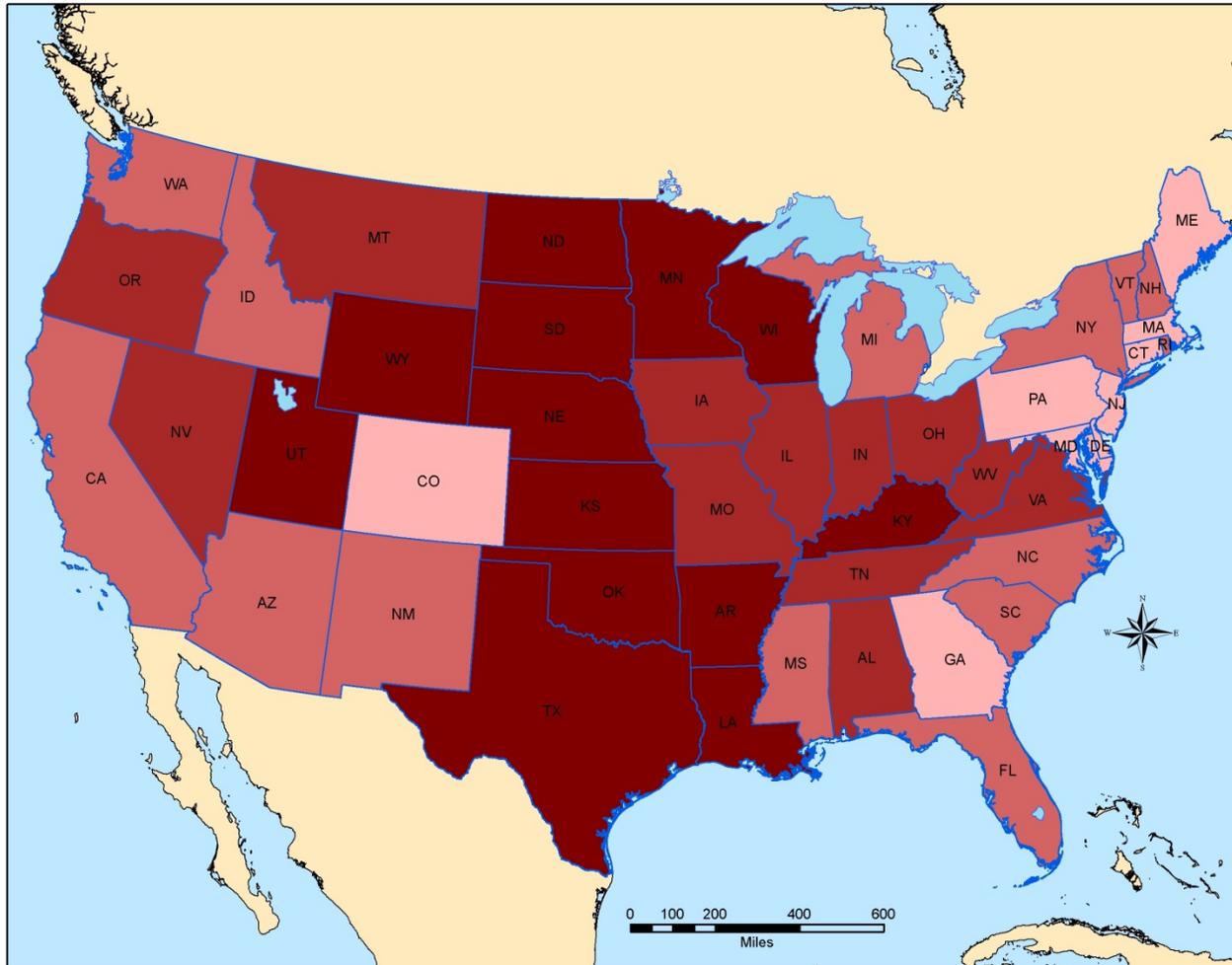


**Map 40:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Priority 5  
By State FY - 2014



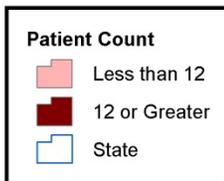
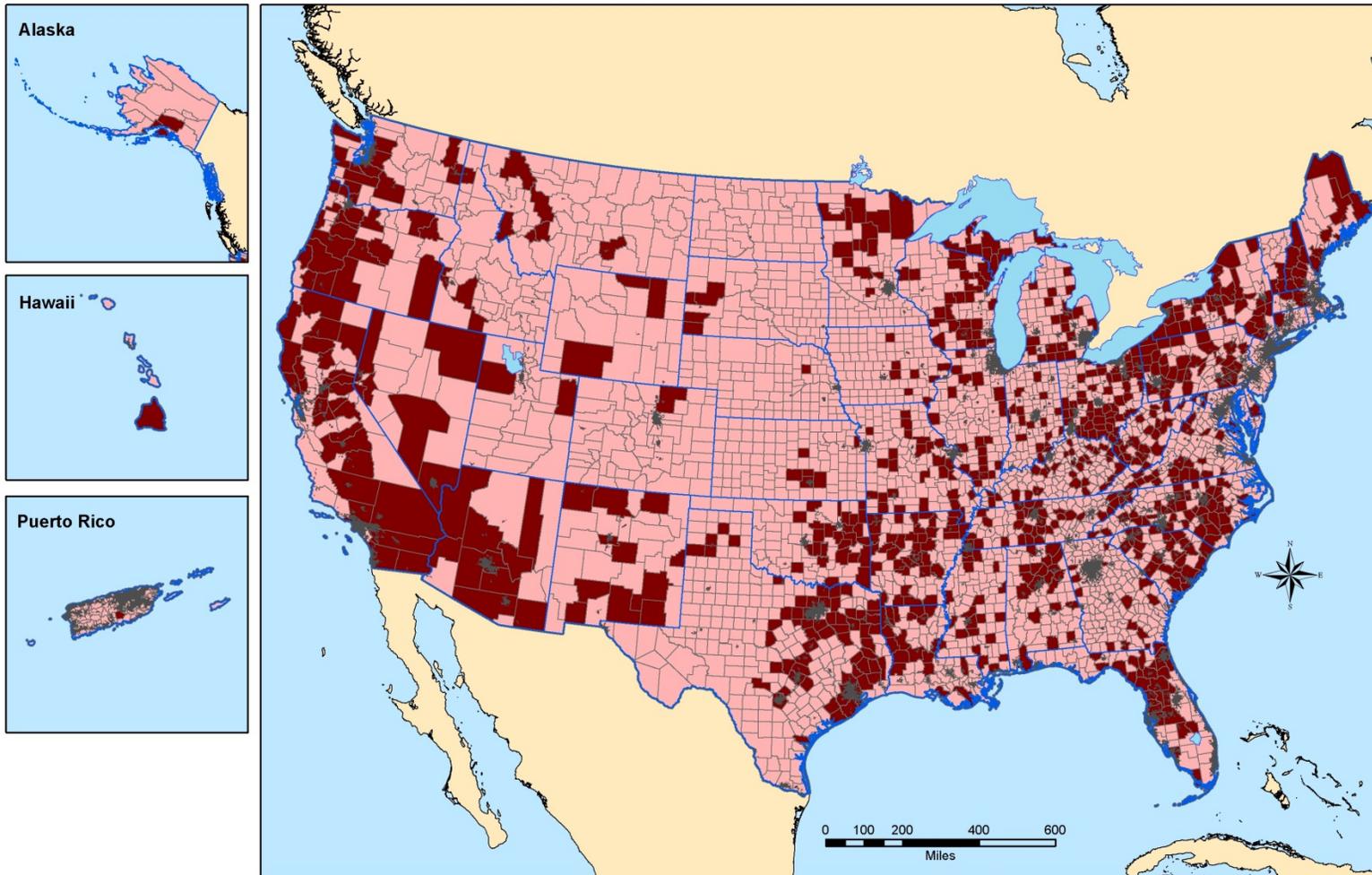
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# Congestive Heart Failure



Map 41:

Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Priority 5  
Of All Rural and Highly Rural Patients Priority 5  
By State FY - 2014

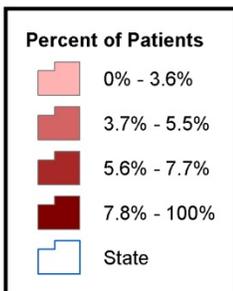
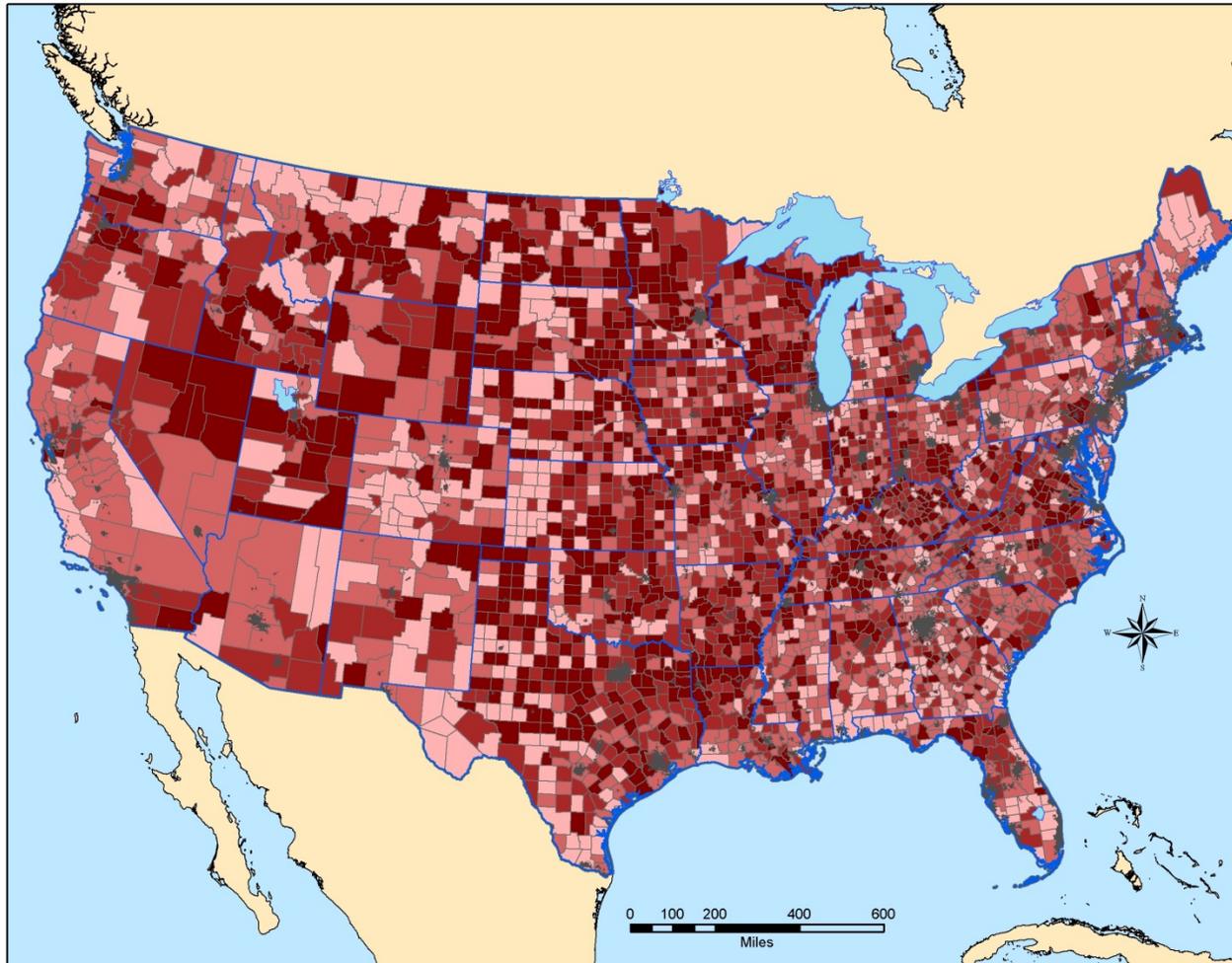


**Map 42:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Priority 5  
By County FY - 2014  
Urban Areas "Shaded"



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Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 43:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Priority 5 Of All Rural and Highly Rural Patients Priority 5 By County FY - 2014  
Urban Areas "Shaded"

### **Section IV Highlights: VHA Patients with Congestive Heart Failure (Outpatient Utilization)**

Table 6 examines overall utilization of VHA health care facilities by those VHA patients with a primary diagnosis of Congestive Heart Failure. That is, patients who may have had an encounter with the diagnosis set as the primary diagnosis. At the National level, 2.08% (N=129,246) of all VHA patients had a primary diagnosis of Congestive Heart Failure. At the network level, the range ran from a low of 2,774 individuals in the Upstate New York Network (VISN 2), representing 2.03%, to a high of 11,848 individuals in the South Central Network (VISN 16), representing 2.36%.

Using the example of the South Central Network (VISN 16), a small percent (0.35%) of all 13,310,260 outpatient encounters were by those VHA patients with a primary diagnosis of Congestive Heart Failure. A closer examination can be conducted for counts and percentages of outpatient encounters by those residing in rural and highly rural areas. For the purposes of simplicity, a combined percentage – indicated in red text – was calculated for both rural and highly rural numbers, both at the network and National level. Again, looking at the South Central Network (VISN 16), combined rural patients with a primary diagnosis of Congestive Heart Failure represented only 0.16% of all outpatient encounters in that network, compared to 0.35% when compared to overall rurality categories combined (highly rural, rural, urban, unknown).

Table 7 provides information on outpatient encounters for all patients with a primary diagnosis of Congestive Heart Failure by rurality. In this table, some very interesting urban-rural comparisons across VISNs emerge. For example, the Midwest Network (VISN 23) had a total of 32,389 outpatient encounters for patients who had a primary diagnosis of Congestive Heart Failure. More than half (57.0%) of the encounters were from patients living in rural or highly rural areas of the VISN. Following VISN 23, two other networks (in rank order, VISNs 9 and 15) also had more than half of encounters from patients living in rural and highly rural areas of the VISN.

# Congestive Heart Failure



Table 6: Outpatient Encounters of Patients with a Primary Diagnosis of Congestive Heart Failure

Overall Resource Utilization- Congestive Heart Failure (Primary Diagnosis Group) Compared to All Users, FY-2014										
Veterans Integrated Service Network	Total Number of Patients	Patients with Congestive Heart Failure		Outpatient Encounters						
		N	%	Total	Congestive Heart Failure					
	N			HR	R	%	U	Unk	%	
New England (01)	253,326	4,959	1.96	7,306,431	97	6,393	0.09	19,668	3	0.36
Upstate NY (02)	136,497	2,774	2.03	4,189,442	31	5,020	0.12	5,508	0	0.25
NY/NJ (03)	174,457	3,447	1.98	5,308,815	0	865	0.02	11,260	0	0.23
Stars and Stripes (04)	310,940	5,803	1.87	8,188,223	13	9,874	0.12	16,322	2	0.32
Capitol (05)	150,012	2,336	1.56	3,919,003	0	2,483	0.06	9,306	1	0.30
Mid-Atlantic (06)	359,692	6,811	1.89	9,682,967	3	8,583	0.09	10,074	2	0.19
Southeast (07)	408,164	8,251	2.02	10,588,864	0	14,592	0.14	17,922	1	0.31
Sunshine (08)	576,411	10,130	1.76	17,255,468	10	10,780	0.06	31,758	2	0.25
Mid South (09)	298,396	7,829	2.62	8,424,188	0	13,037	0.15	10,100	0	0.27
Ohio (10)	231,319	5,621	2.43	7,511,566	47	9,000	0.12	14,813	0	0.32
Vets in Partnership (11)	282,135	5,800	2.06	7,691,758	3	9,493	0.12	12,852	0	0.29
Great Lakes (12)	266,879	6,062	2.27	7,705,668	32	6,175	0.08	15,317	1	0.28
Heartland (15)	245,357	6,213	2.53	7,009,124	470	12,736	0.19	13,045	0	0.37
South Central (16)	502,681	11,848	2.36	13,310,260	71	21,866	0.16	24,060	2	0.35
Heart of Texas (17)	306,581	6,878	2.24	7,950,682	98	10,171	0.13	17,504	2	0.35
Southwest (18)	271,557	5,581	2.06	6,738,226	1,558	7,910	0.14	21,431	10	0.46
Rocky Mtn. (19)	202,350	4,028	1.99	4,987,574	2,281	4,423	0.13	10,856	14	0.35
Northwest (20)	288,322	6,347	2.20	6,791,502	1,387	11,292	0.19	17,635	0	0.45
Sierra Pacific (21)	293,645	5,803	1.98	6,828,680	429	5,808	0.09	19,459	67	0.38
Desert Pacific (22)	328,951	5,593	1.70	8,520,022	202	1,398	0.02	16,880	0	0.22
Midwest (23)	324,728	7,132	2.20	8,146,785	1,467	16,995	0.23	13,927	0	0.40
<b>Grand Total</b>	<b>6,212,400</b>	<b>129,246</b>	<b>2.08</b>	<b>168,055,248</b>	<b>8,199</b>	<b>188,894</b>	<b>0.12</b>	<b>329,697</b>	<b>107</b>	<b>0.31</b>

**Table 7: Outpatient Encounters of Patients with a Primary Diagnosis of Congestive Heart Failure by Rurality**

Veterans Integrated Service Network	Outpatient Encounters by Patients with Primary Congestive Heart Failure DX					
	Total	Rurality				
	N	HR	R	%	U	Unk
New England (01)	26,161	97	6,393	24.81	19,668	3
Upstate NY (02)	10,559	31	5,020	47.84	5,508	0
NY/NJ (03)	12,125	0	865	7.13	11,260	0
VISN 04 (04)	26,211	13	9,874	37.72	16,322	2
Capitol (05)	11,790	0	2,483	21.06	9,306	1
Mid-Atlantic (06)	18,662	3	8,583	46.01	10,074	2
Southeast (07)	32,515	0	14,592	44.88	17,922	1
Sunshine (08)	42,550	10	10,780	25.36	31,758	2
Mid South (09)	23,137	0	13,037	56.35	10,100	0
Ohio (10)	23,860	47	9,000	37.92	14,813	0
Vets in Partnership (11)	22,348	3	9,493	42.49	12,852	0
Great Lakes (12)	21,525	32	6,175	28.84	15,317	1
Heartland (15)	26,251	470	12,736	50.31	13,045	0
South Central (16)	45,999	71	21,866	47.69	24,060	2
Heart of Texas (17)	27,775	98	10,171	36.97	17,504	2
Southwest (18)	30,909	1,558	7,910	30.63	21,431	10
Rocky Mtn. (19)	17,574	2,281	4,423	38.15	10,856	14
Northwest (20)	30,314	1,387	11,292	41.83	17,635	0
Sierra Pacific (21)	25,763	429	5,808	24.21	19,459	67
Desert Pacific (22)	18,480	202	1,398	8.66	16,880	0
Midwest (23)	32,389	1,467	16,995	57.00	13,927	0
<b>TOTAL</b>	<b>526,897</b>	<b>8,199</b>	<b>188,894</b>	<b>37.41</b>	<b>329,697</b>	<b>107</b>

## Congestive Heart Failure



Table 8 examines the overall outpatient encounters at VHA health care facilities by those VHA patients with a secondary diagnosis of Congestive Heart Failure. That is, patients who had an encounter with Congestive Heart Failure as the secondary diagnosis. At the National level, 3.03% (N=188,053) of all VHA patients had a secondary diagnosis of Congestive Heart Failure. At the network level, the range ran from a low of 3,190 individuals in the Capitol Network (VISN 5), representing 2.13%, to a high of 16,789 individuals in the South Central Network (VISN 16), representing 3.34%.

In Table 9 (similar to Table 7 for patients with a primary diagnosis of Congestive Heart Failure) information on outpatient encounters for all patients with a secondary diagnosis of Congestive Heart Failure by rurality is reported. The percentage of encounters by rural and highly rural patients constituted a large share of the total Congestive Heart Failure encounters in VISN 23 (62.6%). Following VISN 23, five other networks (in rank order, VISNs 9, 16, 15, 6, and 2) had more than half of the encounters from patients with a secondary diagnosis of Congestive Heart Failure living in rural and highly rural areas of the VISN.

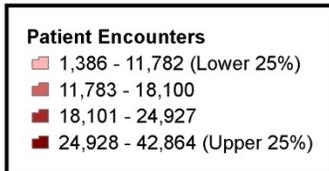
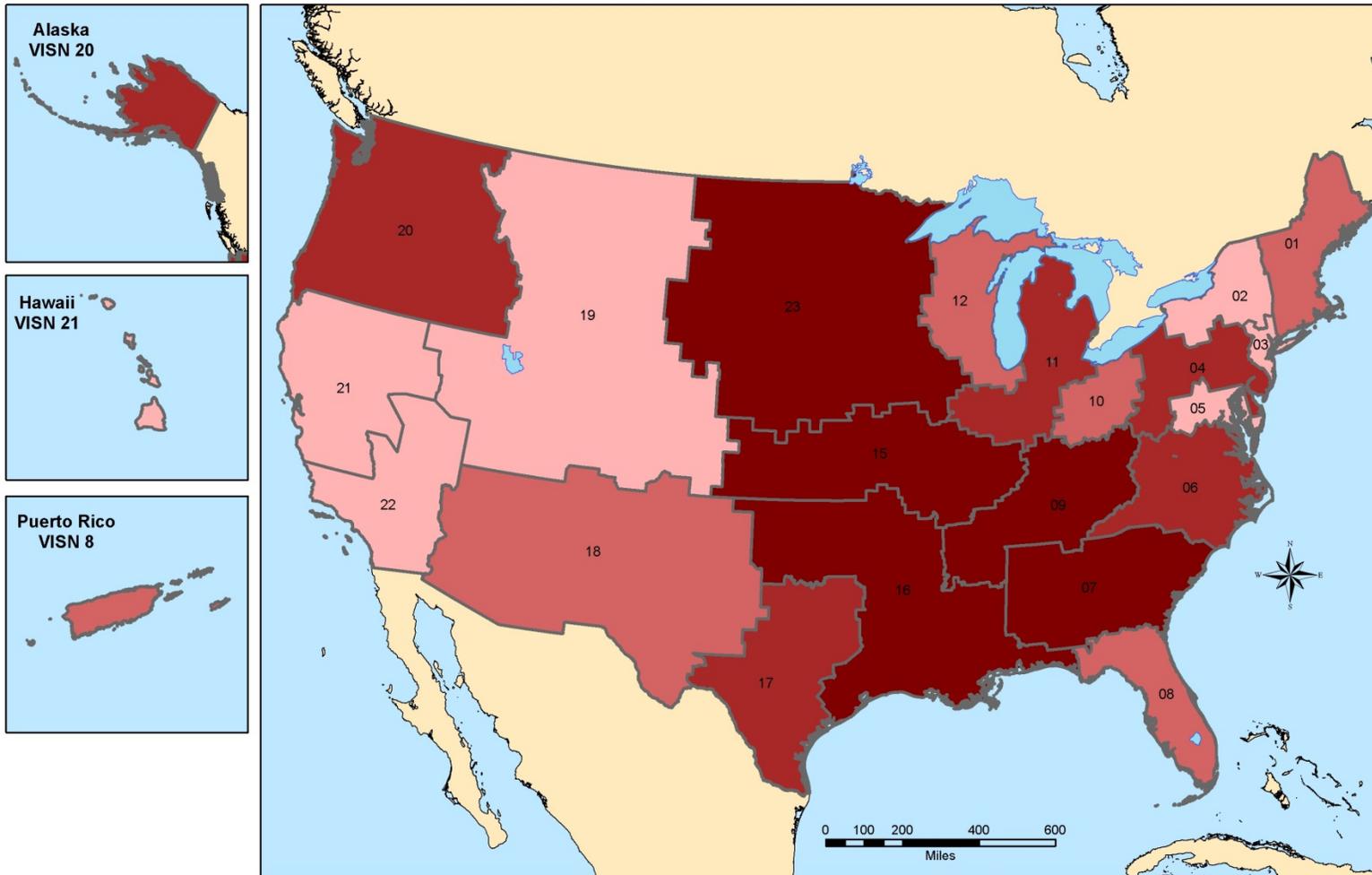
**Table 8: Outpatient Encounters of Patients with a Secondary Diagnosis of Congestive Heart Failure**

Overall Resource Utilization- Congestive Heart Failure (Secondary Diagnosis Group) Compared to All Users, FY-2014										
Veterans Integrated Service Network	Total Number of Patients	Patients with Congestive Heart Failure		Outpatient Encounters						
		N	%	Total	Congestive Heart Failure					
	N			HR	R	%	U	Unk	%	
New England (01)	253,326	6,993	2.76	7,306,431	56	6,652	0.09	16,159	0	0.31
Upstate NY (02)	136,497	4,121	3.02	4,189,442	8	5,021	0.12	4,986	0	0.24
NY/NJ (03)	174,457	4,775	2.74	5,308,815	1	520	0.01	10,020	0	0.20
Stars and Stripes (04)	310,940	10,536	3.39	8,188,223	2	9,847	0.12	15,209	1	0.31
Capitol (05)	150,012	3,190	2.13	3,919,003	0	1,676	0.04	6,674	1	0.21
Mid-Atlantic (06)	359,692	10,599	2.95	9,682,967	10	16,331	0.17	15,714	2	0.33
Southeast (07)	408,164	11,384	2.79	10,588,864	0	10,792	0.10	12,891	1	0.22
Sunshine (08)	576,411	15,166	2.63	17,255,468	9	6,745	0.04	26,859	1	0.19
Mid South (09)	298,396	11,565	3.88	8,424,188	0	21,021	0.25	16,952	0	0.45
Ohio (10)	231,319	8,724	3.77	7,511,566	20	9,033	0.12	16,337	0	0.34
Vets in Partnership (11)	282,135	8,956	3.17	7,691,758	0	9,265	0.12	11,548	1	0.27
Great Lakes (12)	266,879	9,209	3.45	7,705,668	151	8,379	0.11	19,043	2	0.36
Heartland (15)	245,357	9,227	3.76	7,009,124	208	13,359	0.19	12,545	0	0.37
South Central (16)	502,681	16,789	3.34	13,310,260	49	20,878	0.16	17,414	0	0.29
Heart of Texas (17)	306,581	8,839	2.88	7,950,682	111	8,090	0.10	12,086	1	0.26
Southwest (18)	271,557	7,231	2.66	6,738,226	750	4,939	0.08	11,080	16	0.25
Rocky Mtn. (19)	202,350	5,143	2.54	4,987,574	1,454	3,404	0.10	10,713	3	0.31
Northwest (20)	288,322	8,346	2.89	6,791,502	1,037	8,778	0.14	12,036	1	0.32
Sierra Pacific (21)	293,645	7,981	2.72	6,828,680	156	5,389	0.08	15,955	79	0.32
Desert Pacific (22)	328,951	8,158	2.48	8,520,022	190	1,806	0.02	19,092	0	0.25
Midwest (23)	324,728	11,121	3.42	8,146,785	1,530	11,822	0.16	7,976	0	0.26
<b>Grand Total</b>	<b>6,212,400</b>	<b>188,053</b>	<b>3.03</b>	<b>168,055,248</b>	<b>5,742</b>	<b>183,747</b>	<b>0.11</b>	<b>291,289</b>	<b>109</b>	<b>0.29</b>

# Congestive Heart Failure

Table 9: Outpatient Encounters of Patients with a Secondary Diagnosis of Congestive Heart Failure by Rurality

Veterans Integrated Service Network	Outpatient Encounters by Patients with Secondary Congestive Heart Failure DX					
	Total	Rurality				
	N	HR	R	%	U	Unk
New England (01)	22,867	56	6,652	29.33	16,159	0
Upstate NY (02)	10,015	8	5,021	50.21	4,986	0
NY/NJ (03)	10,541	1	520	4.94	10,020	0
VISN 04 (04)	25,059	2	9,847	39.30	15,209	1
Capitol (05)	8,351	0	1,676	20.07	6,674	1
Mid-Atlantic (06)	32,057	10	16,331	50.97	15,714	2
Southeast (07)	23,684	0	10,792	45.57	12,891	1
Sunshine (08)	33,614	9	6,745	20.09	26,859	1
Mid South (09)	37,973	0	21,021	55.36	16,952	0
Ohio (10)	25,390	20	9,033	35.66	16,337	0
Vets in Partnership (11)	20,814	0	9,265	44.51	11,548	1
Great Lakes (12)	27,575	151	8,379	30.93	19,043	2
Heartland (15)	26,112	208	13,359	51.96	12,545	0
South Central (16)	38,341	49	20,878	54.58	17,414	0
Heart of Texas (17)	20,288	111	8,090	40.42	12,086	1
Southwest (18)	16,785	750	4,939	33.89	11,080	16
Rocky Mtn. (19)	15,574	1,454	3,404	31.19	10,713	3
Northwest (20)	21,852	1,037	8,778	44.92	12,036	1
Sierra Pacific (21)	21,579	156	5,389	25.70	15,955	79
Desert Pacific (22)	21,088	190	1,806	9.47	19,092	0
Midwest (23)	21,328	1,530	11,822	62.60	7,976	0
<b>TOTAL</b>	<b>480,887</b>	<b>5,742</b>	<b>183,747</b>	<b>39.40</b>	<b>291,289</b>	<b>109</b>

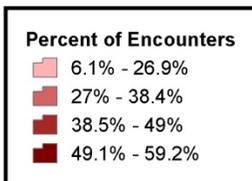
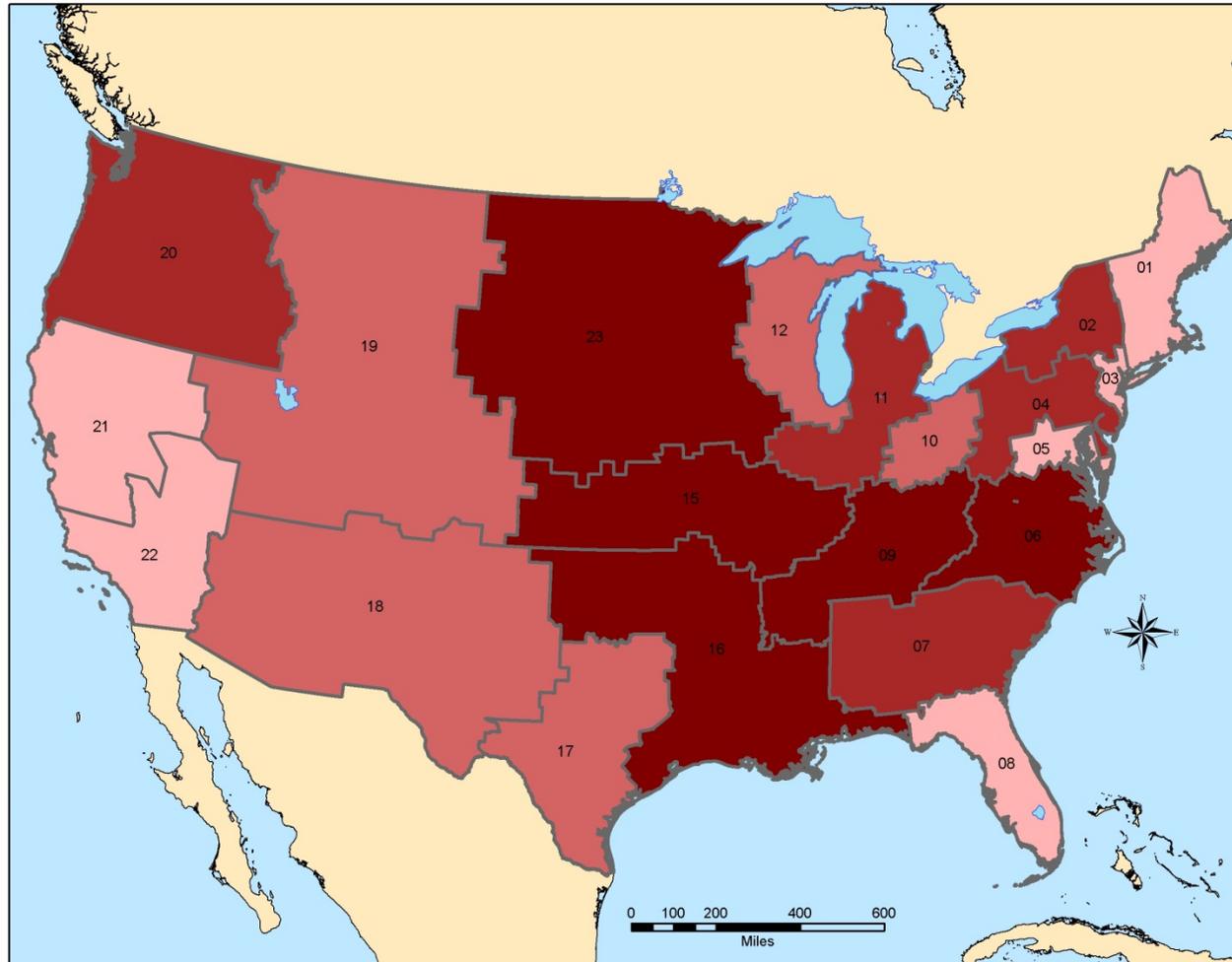


**Map 44:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Encounters  
By VISN FY - 2014

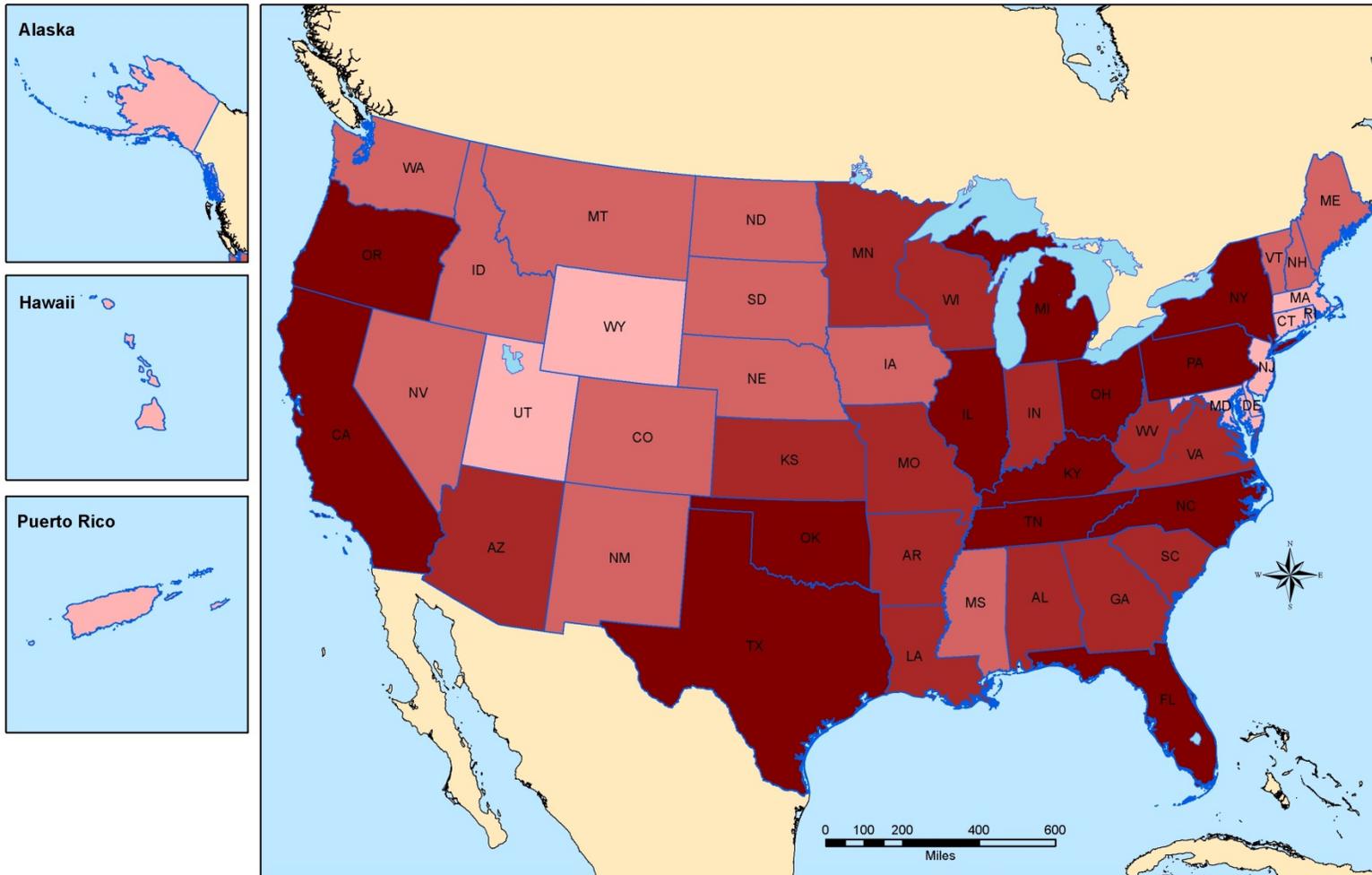


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GeoSpatial Outcomes Division  
(Map Creation Date: 8/13/2015)  
Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 45:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Encounters Of All VHA Patient Congestive Heart Failure Encounters By VISN FY - 2014



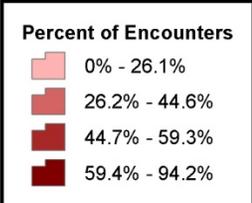
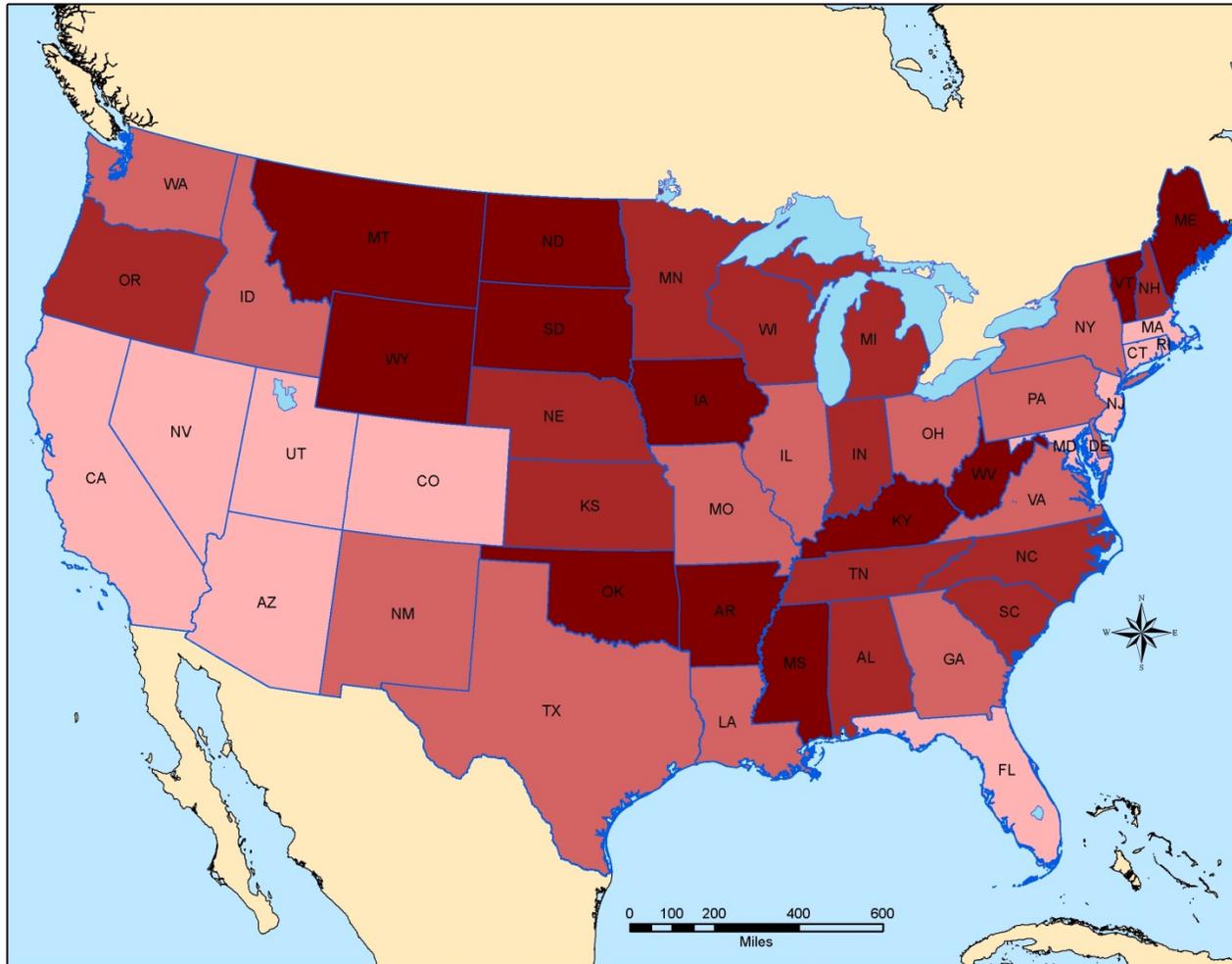
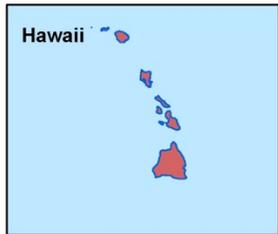
Patient Encounters	
<span style="display:inline-block; width:15px; height:10px; background-color:#f8d7da;"></span>	0 - 1,880 (Lower 25%)
<span style="display:inline-block; width:15px; height:10px; background-color:#e2d9e2;"></span>	1,881 - 6,962
<span style="display:inline-block; width:15px; height:10px; background-color:#c6c6c6;"></span>	6,963 - 11,176
<span style="display:inline-block; width:15px; height:10px; background-color:#999999;"></span>	11,177 - 28,567 (Upper 25%)

**Map 46:**  
Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure  
Encounters  
By State FY - 2014

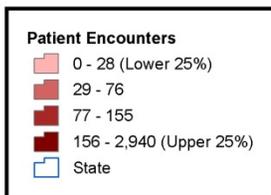
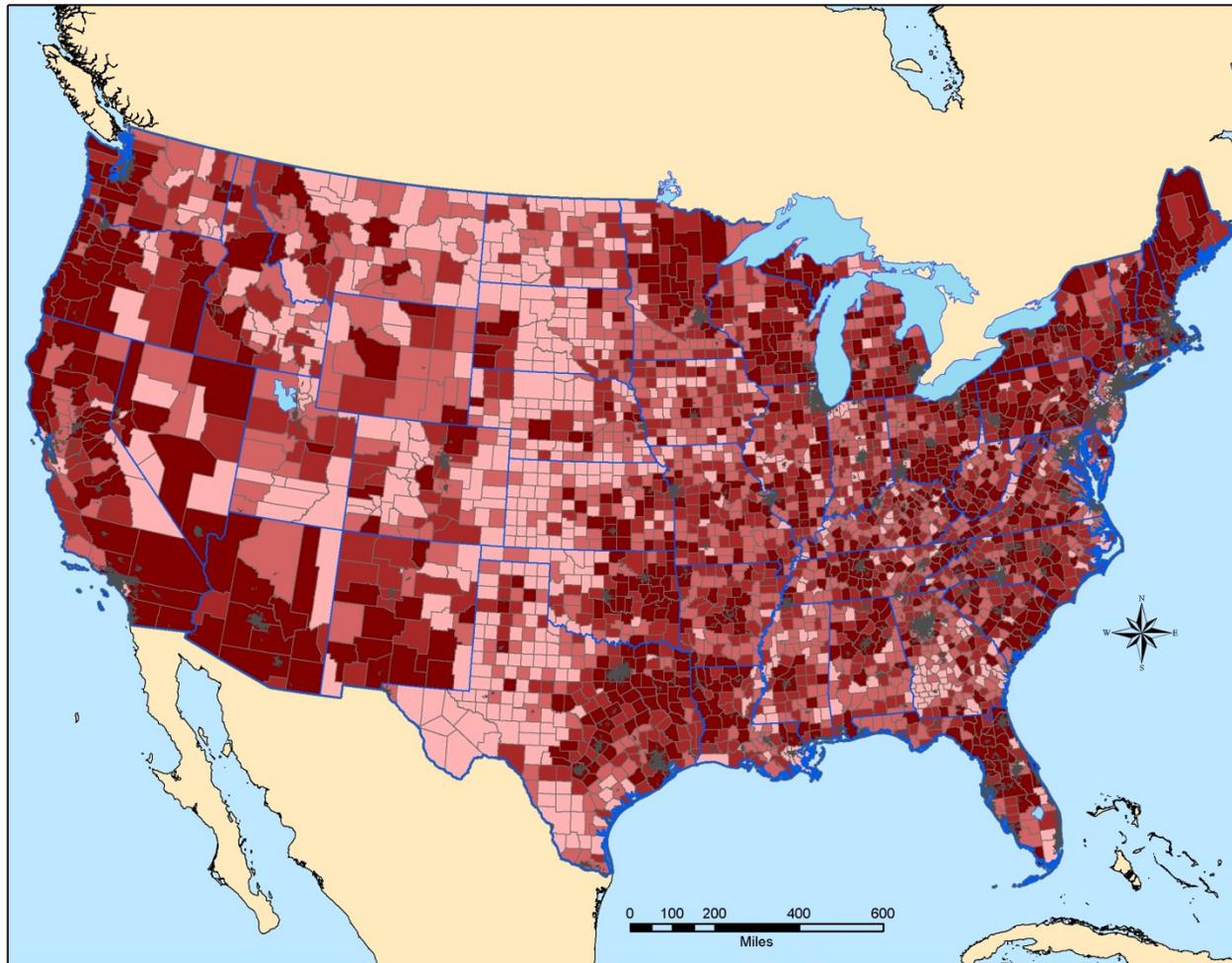
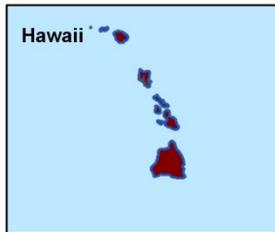
 **GeoSpatial  
Outcomes Division**  
VHA Office of Rural Health

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GeoSpatial Outcomes Division  
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# Congestive Heart Failure



**Map 47:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Encounters Of All VHA Patient Congestive Heart Failure Encounters By State FY - 2014



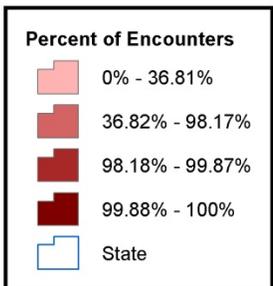
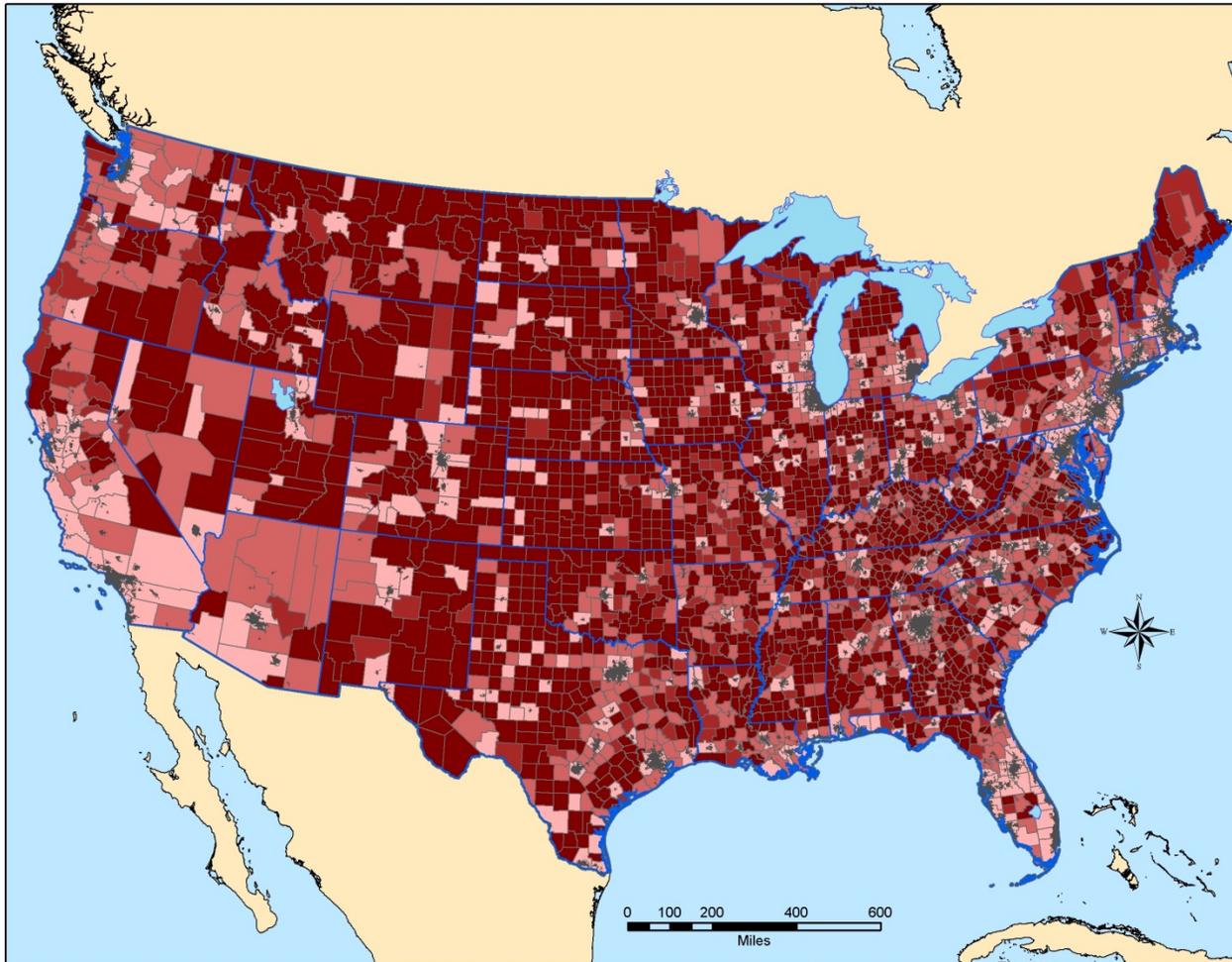
**Map 48:**

Number of Rural and Highly Rural VHA Patients  
with Congestive Heart Failure Encounters  
By County FY - 2014  
Urban Areas "Shaded"



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GeoSpatial Outcomes Division  
(Map Creation Date: 8/12/2015)  
Map Information by: PSSG, VSSC, ESRI  
ArcGIS 10.2x

# Congestive Heart Failure



**Map 49:**  
Percent of Rural and Highly Rural VHA Patients with Congestive Heart Failure, Encounters Of All VHA Congestive Heart Failure Encounters By County FY - 2014  
Urban Areas "Shaded"

## References

1) Diagnosis Cube Documentation, available at:

<http://vaww.vssc.med.va.gov/VSSCEnhancedProductManagement/DisplayDocument.aspx?DocumentID=16>

NOTE: This is an internal VA website and is not accessible to the public.

2) Enrollment Priority Groups, available at:

[http://www.va.gov/healthbenefits/resources/publications/IB10-441\\_enrollment\\_priority\\_groups.pdf](http://www.va.gov/healthbenefits/resources/publications/IB10-441_enrollment_priority_groups.pdf).

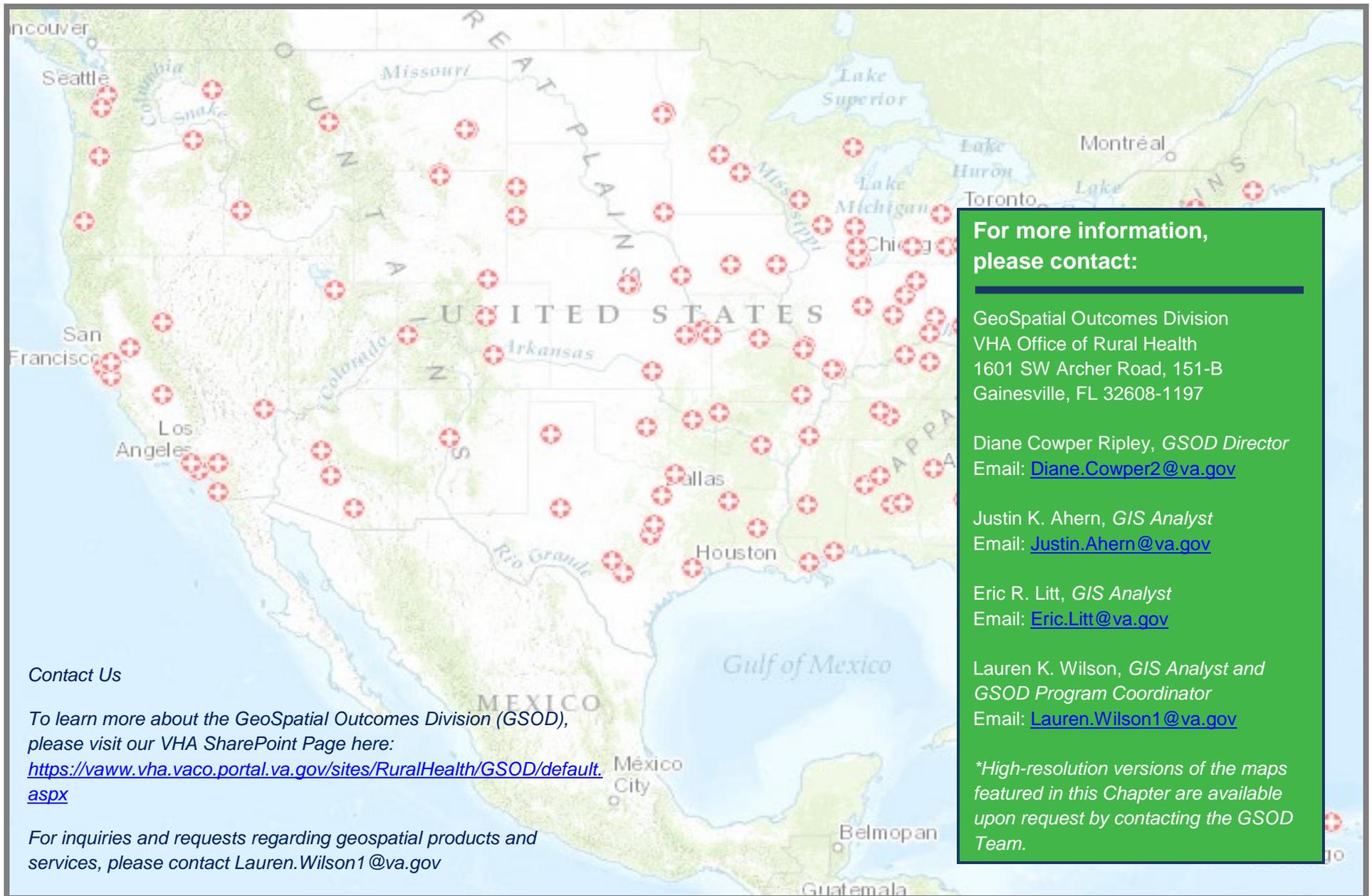
## Project Team

**Diane C. Cowper Ripley, Ph.D.** is presently Site Co- Director of the HSR&D-funded Center of Innovation on Disability and Rehabilitation Research (CINDRR) and the Director of the Veterans Rural Health Resource Center-Eastern Region's GeoSpatial Outcomes Division (GSOD). Her research has focused on Veterans' access and utilization issues for over 31 years.

**Justin K. Ahern, B.A.** is a geographer and the newest staff member of the GeoSpatial Outcomes Division. He hopes to bring his diversity of skills and experiences to satisfy the GSOD's mission of supporting both Research and Operations related to improving access to health care for rural Veterans.

**Eric R. Litt, B.A.** is a geographer and has been with the VA since 2006. He also serves as Deputy Director of the GeoSpatial Outcomes Division. Mr. Litt has a strong interest in and deep commitment to assisting our Veterans by providing geospatial analyses that ultimately may improve access to health care services.

**Lauren K. Wilson, B.S.** serves as the program coordinator and GIS Analyst with the GeoSpatial Outcomes Division. She has been employed with the VA since 2009 and has been using GIS tools since 2005. Her main focus is geospatial analyses and geostatistics and their myriad uses for evidence-based research and policy influence for meaningful change in access to health care for rural Veterans.



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*\*High-resolution versions of the maps featured in this Chapter are available upon request by contacting the GSOD Team.*

**Contact Us**

To learn more about the GeoSpatial Outcomes Division (GSOD), please visit our VHA SharePoint Page here: <https://vaww.vha.vaco.portal.va.gov/sites/RuralHealth/GSOD/default.aspx>

For inquiries and requests regarding geospatial products and services, please contact [Lauren.Wilson1@va.gov](mailto:Lauren.Wilson1@va.gov)