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# 7 Maps At-A-Glance

In this section, we placed multiple maps on a page to enhance the reader's ability to visually compare geographic patterns. To ease visual comparison across maps in this section, we only included the continental United States, and we omitted the frequency distribution graphs.

### Stroke Subtype

The first set of maps (page 142) compares the geographic patterns of different stroke subtypes for the total population of Medicare beneficiaries in this *Atlas*. The next sets of maps (pages 143–146) compare the geographic patterns for each of the stroke subtypes by race/ethnicity.

#### **Stroke Subtypes**

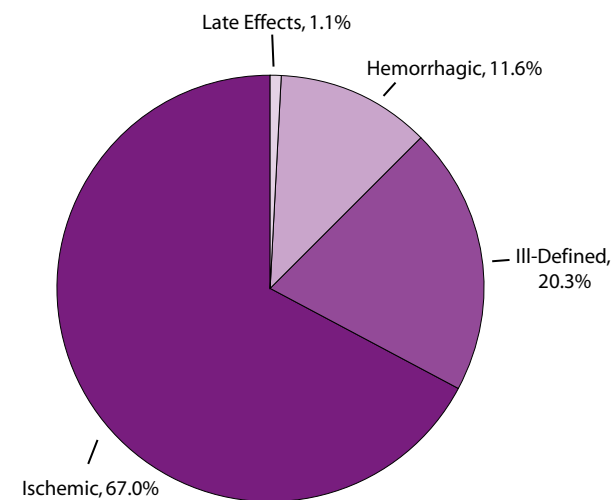
**Ischemic Stroke**—a stroke caused by a deficiency of blood to the brain, usually due to the functional constriction or blockage of a blood vessel.

**Hemorrhagic Stroke**—a stroke caused by the escape of blood (bleeding) to the brain, usually due to the rupture of a blood vessel.

**Ill-Defined Stroke**—diagnosis or classification used when there is not enough medical information to classify a stroke as ischemic or hemorrhagic.

Two-thirds (67.0%) of the stroke hospitalizations among Medicare beneficiaries in this *Atlas* were ischemic, 11.6% were hemorrhagic, 20.3% were ill-defined, and 1.1% were late effects from a stroke (**Figure 7.1**). Hospitalizations due to late effects from a stroke were not mapped in this *Atlas* because the numbers are too small to produce stable county-level rates.

**Figure 7.1 Percentage of stroke hospitalizations, by stroke subtype—Medicare beneficiaries ages 65 and older, 1995–2002**



## Discharge Status

For this section, the first set of maps (pages 148–149) compares the geographic patterns of different discharge destinations for the total population of Medicare beneficiaries in this study. The next sets of maps (pages 150–155) compare the geographic patterns for each discharge destinations by race/ethnicity.

### **Discharge Destinations\***

**Home**—residence or place other than a health care facility where patient receives self-care, health service care, or IV drug therapy.

**Skilled Nursing Facility**—facility that meets specific regulatory certification requirements and that primarily provides inpatient skilled nursing care and related services to patients who require medical, nursing, or rehabilitative services but does not provide the level of care or treatment available in a hospital.

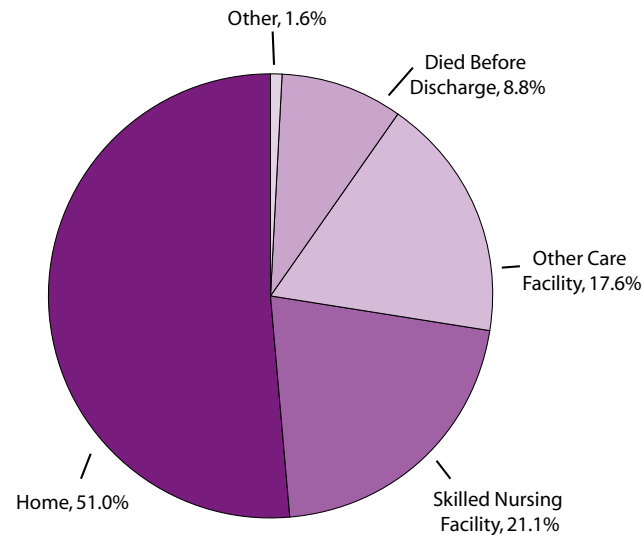
**Other Care Facility**—intermediate care, short-term care, or other type of facility. This category does not include skilled nursing facilities.

**Any Care Facility**—skilled nursing, intermediate care, short-term care, or other type of facility. This category includes skilled nursing facilities and other care facilities (listed above).

**Died Before Discharge**—patient died during the hospital stay.

**Died Within 30 Days**—patient died within 30 days of admission to the hospital for a stroke.

**Figure 7.2 Percentage of stroke hospitalizations, by discharge status—Medicare beneficiaries ages 65 and older, 1995–2002**



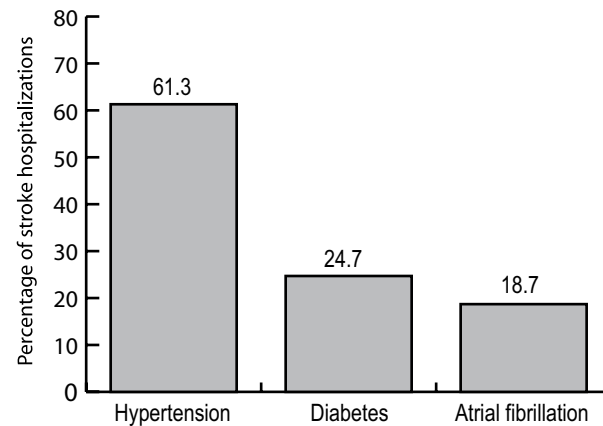
During 1995–2000, more than half of all Medicare beneficiaries hospitalized for a stroke were discharged home (51.0%). Skilled nursing facilities were the second largest destination (21.1%), followed by other care facilities (17.6%) and other discharge outcomes (1.6%). (This category is not reported in Section 3 because it is so small.) In addition, 8.8% of patients died before discharge (**Figure 7.2**), and 13.9% died within 30 days of being admitted to the hospital.

\* Categories of discharge destination defined by Centers for Medicare & Medicaid Services.

## Selected Comorbidities

For this section, the first set of maps (page 157) compares the geographic patterns of hypertension, diabetes, and atrial fibrillation for the total population of Medicare beneficiaries in this *Atlas*. The next sets of maps (pages 158–160) compare the geographic patterns for each of the selected comorbidities by race/ethnicity.

**Figure 7.3 Percentage of stroke hospitalizations with selected comorbidities—Medicare beneficiaries ages 65 and older, 1995–2002**



## Selected Comorbidities

**Atrial fibrillation**—a type of abnormal heart rhythm.

**Diabetes**—a metabolic disorder characterized by inadequate secretion or use of insulin and excessive amounts of sugar in the blood.

**Hypertension**—the condition of repeatedly having an abnormally high blood pressure. The current clinical definition is systolic blood pressure  $\geq 140$  mm/Hg and/or diastolic blood pressure  $\geq 90$  mm/Hg.

Among the stroke hospitalizations examined in this *Atlas*, 61.3% included a diagnosis of hypertension, 24.7% included a diagnosis of diabetes, and 18.7% included a diagnosis of atrial fibrillation (**Figure 7.3**).

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## A Note on Methods

Stroke hospitalizations were defined as those for which the principal diagnosis on the Medicare hospital claim form was cerebrovascular disease, indicated by codes 430–434 and 436–438 according to the *International Classification of Diseases, 9<sup>th</sup> Revision, Clinical Modification* (ICD-9-CM). Hospitalizations for which the principal diagnosis was transient ischemic attacks (ICD-9-CM code 435) were excluded.

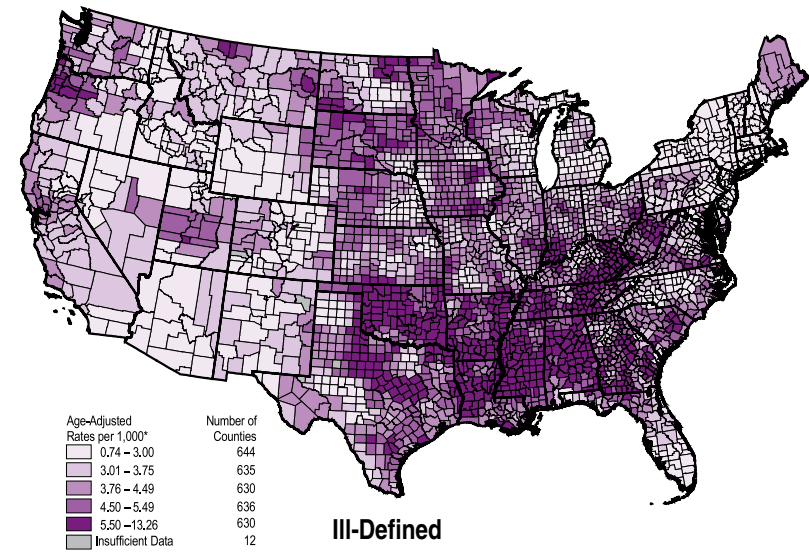
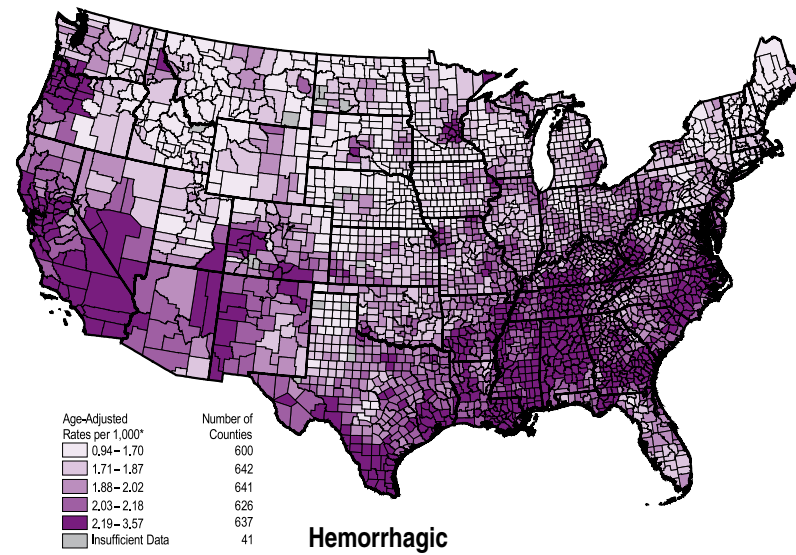
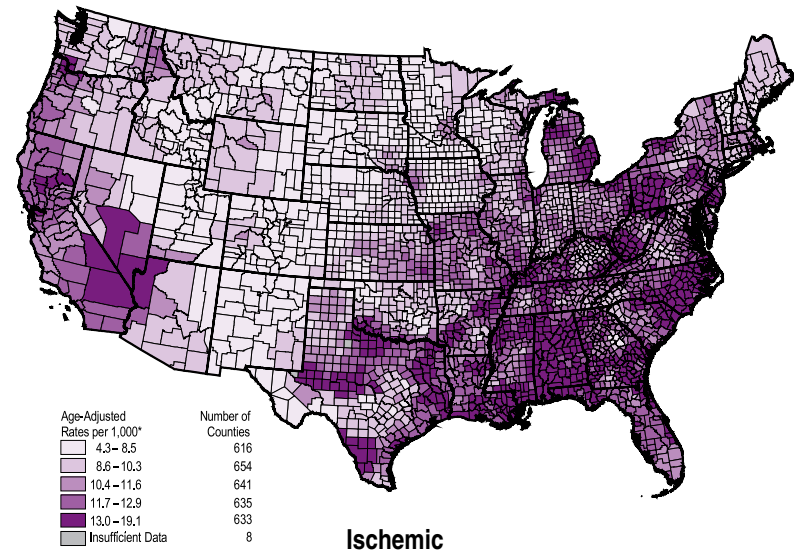
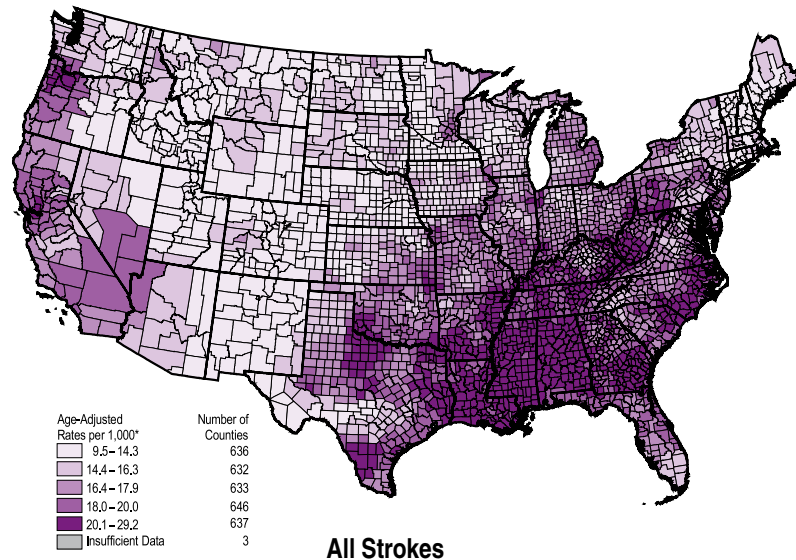
For each map, the counties are categorized according to quintile; the darkest color represents counties with the highest rates or percentages (depending on the data being presented), and the lightest color represents counties with the lowest rates or percentages. All county-level rates and percentages have been spatially smoothed to enhance the stability in counties with small populations. Counties are categorized as having “insufficient data” if the sum of stroke hospitalizations in the index county plus the neighboring counties is less than 20 or if the Medicare population is less than 10. For percentages, a relative standard error  $\geq 30\%$  is an additional criterion for categorizing a county as having insufficient data. For a detailed explanation of the methods, see Appendix B.

## A Cautionary Note

In the Medicare data sets, the accuracy of codes for Hispanic race and ethnicity is limited because these codes are not reported separately. For example, a person who is white and Hispanic is reported as either white or Hispanic. This reporting practice can result in misclassification of race and ethnicity. According to 1996 data, the probability that the racial/ethnic designation on Medicare claim forms is correct is 96.6% for whites and 95.5% for blacks, but only 19.4% for Hispanics. At the same time, the probability that a person identified as Hispanic in the Medicare data set is actually Hispanic is 98% (Arday SL, Arday DR, Monroe A, Zhang MD. HCFA’s racial and ethnic data: current accuracy and recent improvements. *Health Care Financing Review* 2000;21[4]:107–16). Together, these data suggest that Hispanics are underreported in the Medicare data sets and that this underreporting could introduce bias into the results presented here.

# Medicare Beneficiaries Ages 65 and Older 1995–2002

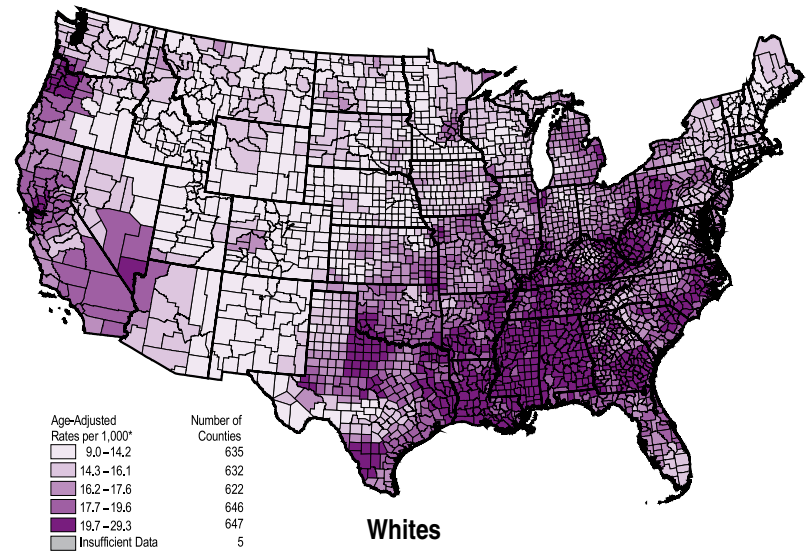
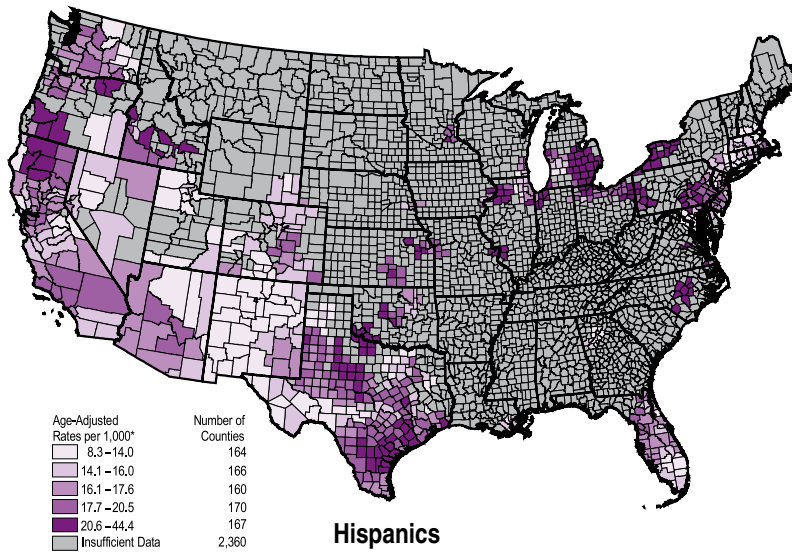
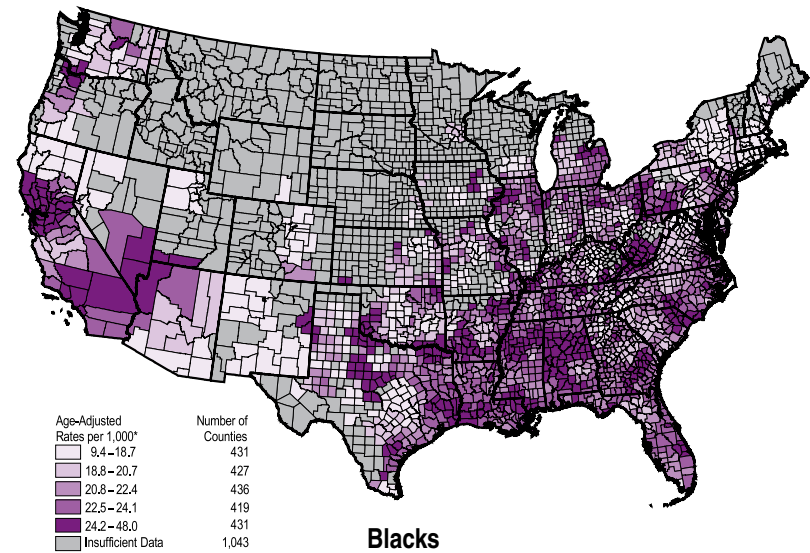
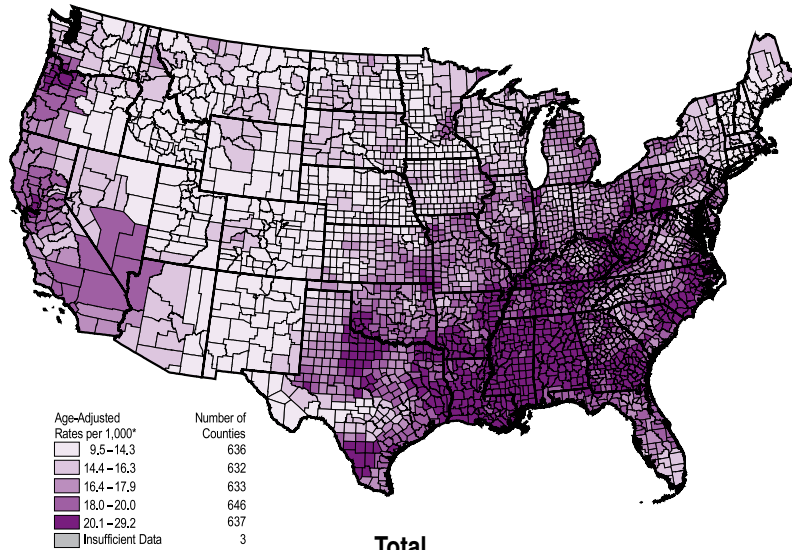
# Stroke Hospitalization Rates Total Population



\* Stroke hospitalization rates are spatially smoothed to enhance the stability of rates in counties with small populations.

## Medicare Beneficiaries Ages 65 and Older 1995–2002

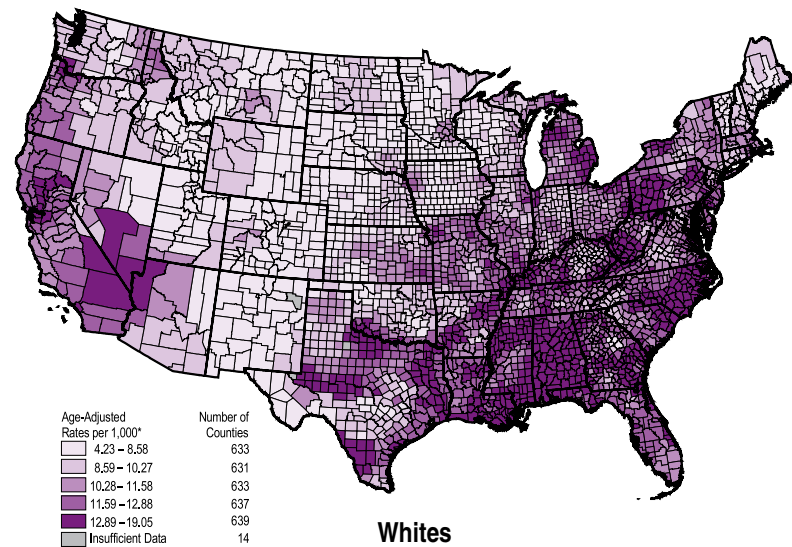
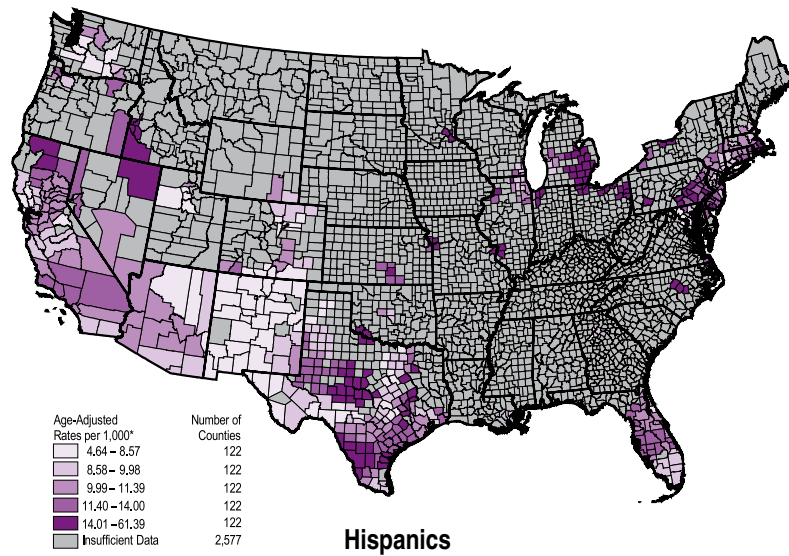
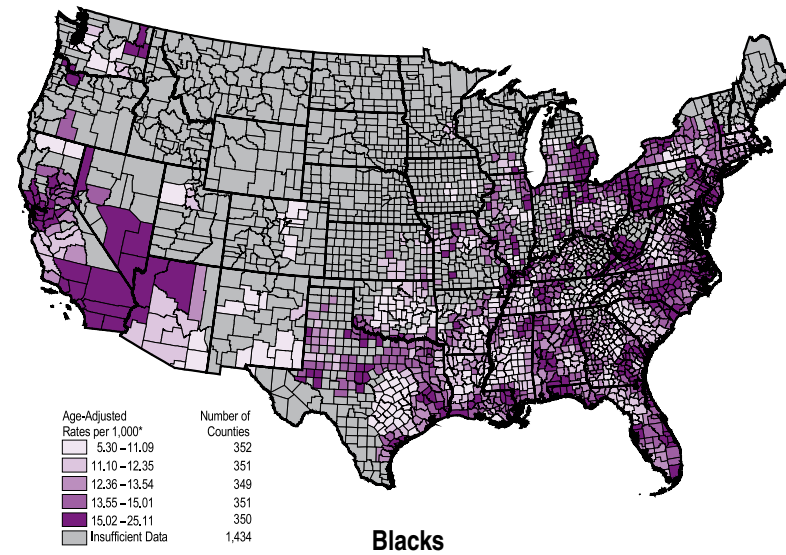
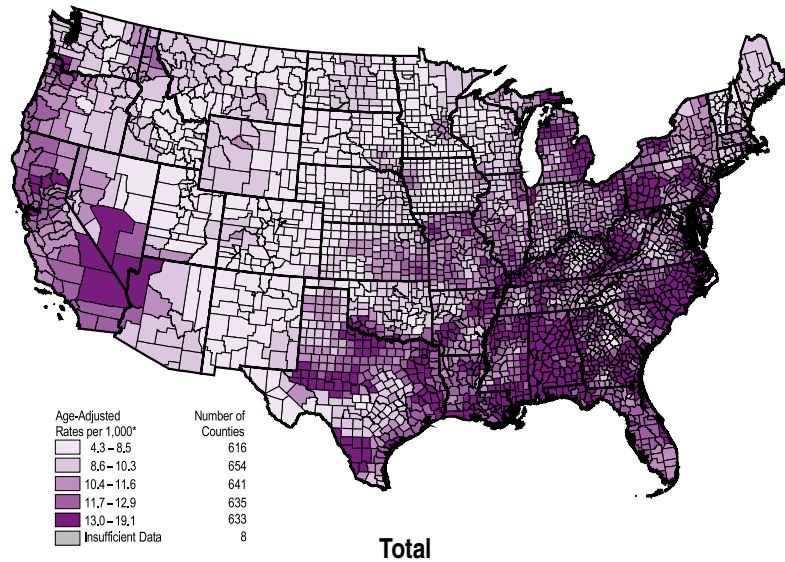
## Stroke Hospitalization Rates All Strokes



\* Stroke hospitalization rates are spatially smoothed to enhance the stability of rates in counties with small populations.

## Medicare Beneficiaries Ages 65 and Older 1995–2002

## Stroke Hospitalization Rates Ischemic Strokes

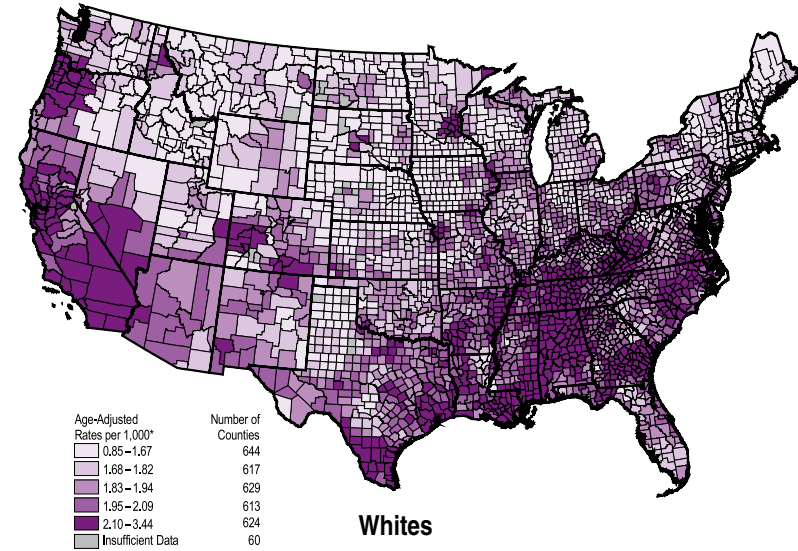
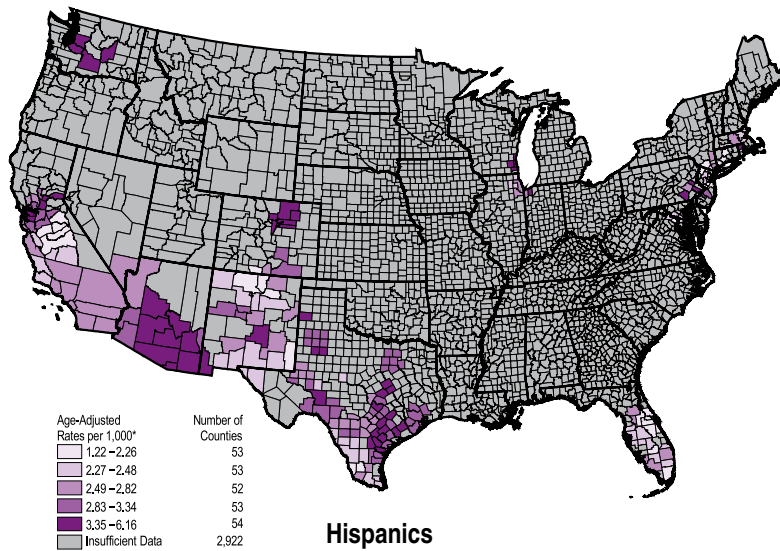
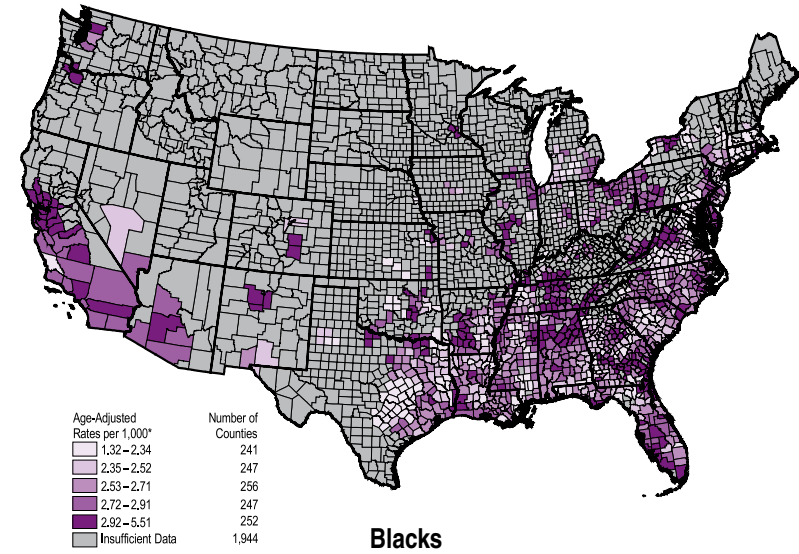
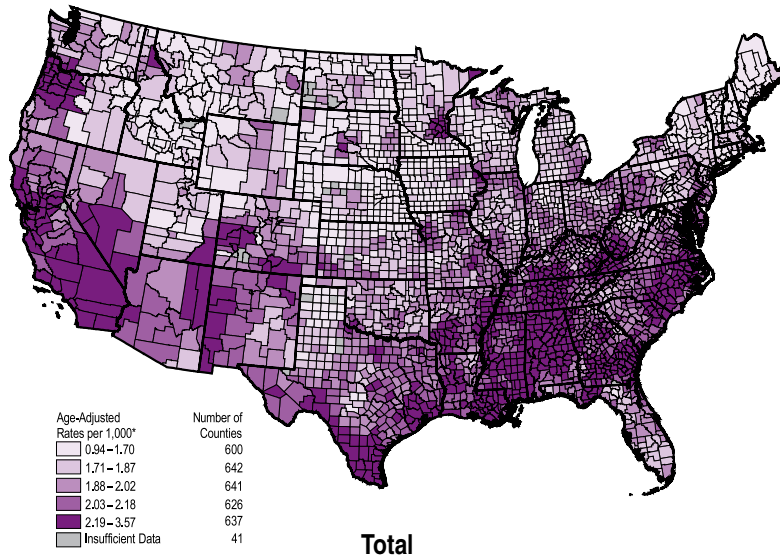


\* Stroke hospitalization rates are spatially smoothed to enhance the stability of rates in counties with small populations.



# Medicare Beneficiaries Ages 65 and Older 1995–2002

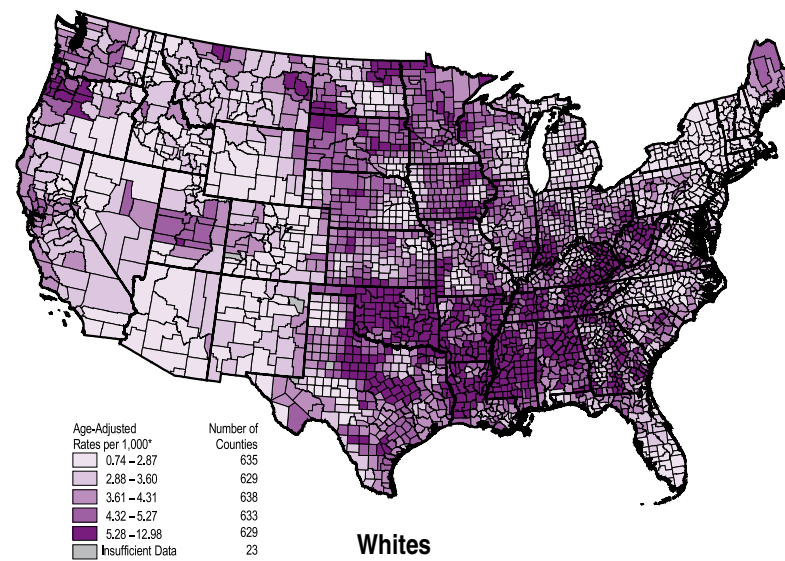
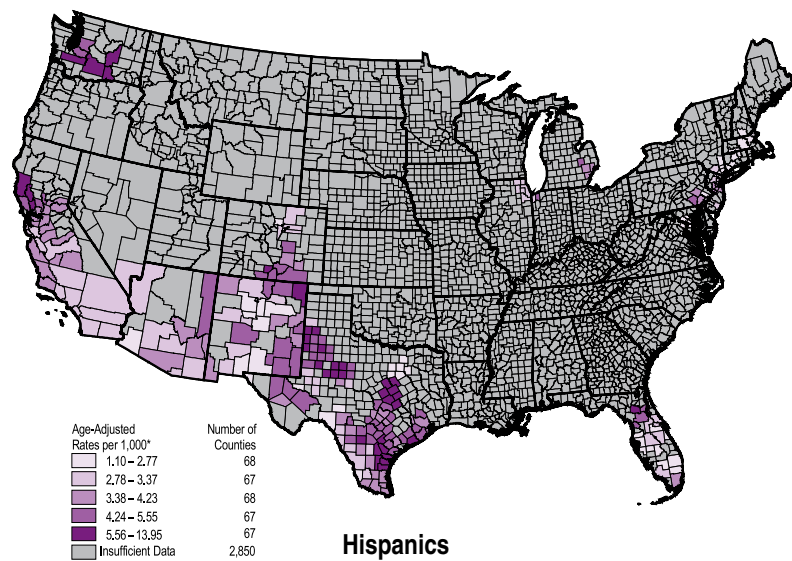
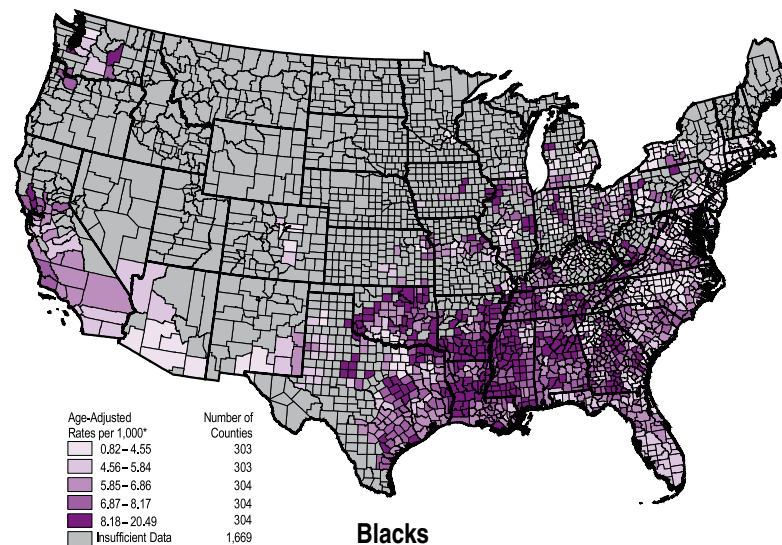
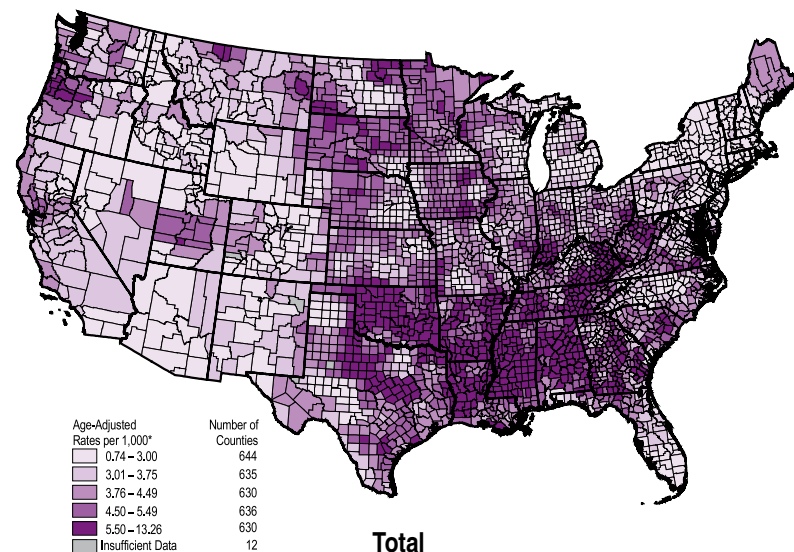
# Stroke Hospitalization Rates Hemorrhagic Strokes



\* Stroke hospitalization rates are spatially smoothed to enhance the stability of rates in counties with small populations.

## Medicare Beneficiaries Ages 65 and Older 1995–2002

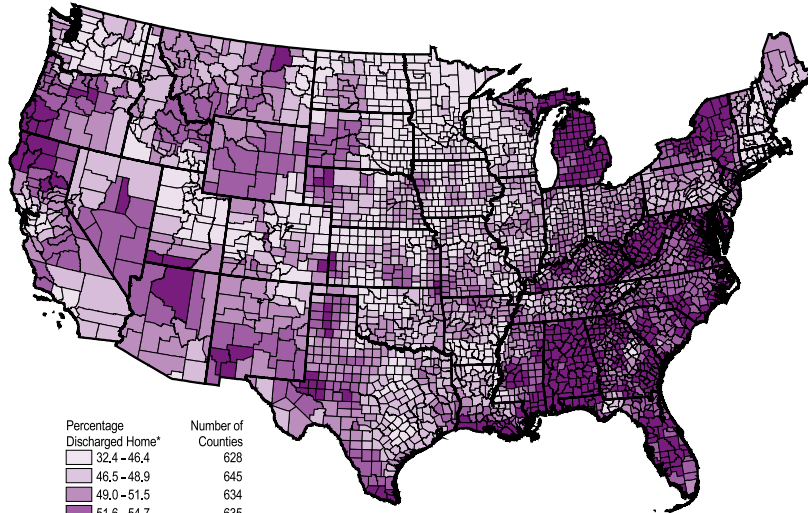
## Stroke Hospitalizations III-Defined Strokes



\* Stroke hospitalization rates are spatially smoothed to enhance the stability of rates in counties with small populations.

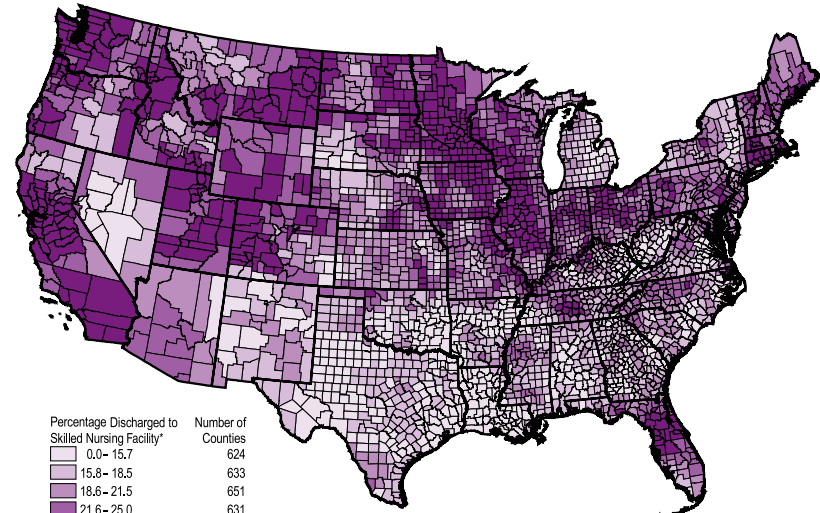
# Medicare Beneficiaries Ages 65 and Older 1995–2002

# Stroke Hospitalizations Discharge Status



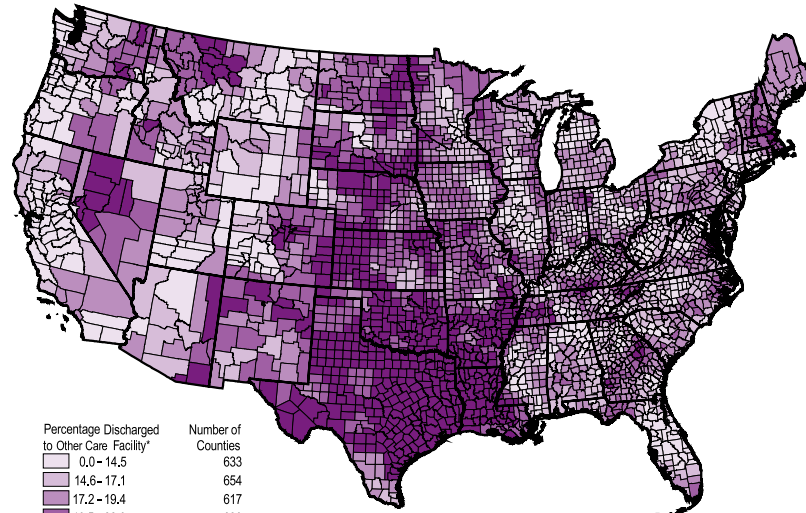
Percentage Discharged Home*	Number of Counties
32.4–46.4	628
46.5–48.9	645
49.0–51.5	634
51.6–54.7	635
54.8–96.3	642
Insufficient Data	3

**Discharged Home**



Percentage Discharged to Skilled Nursing Facility*	Number of Counties
0.0–15.7	624
15.8–18.5	633
18.6–21.5	651
21.6–25.0	631
25.1–37.6	643
Insufficient Data	5

**Skilled Nursing Facility**



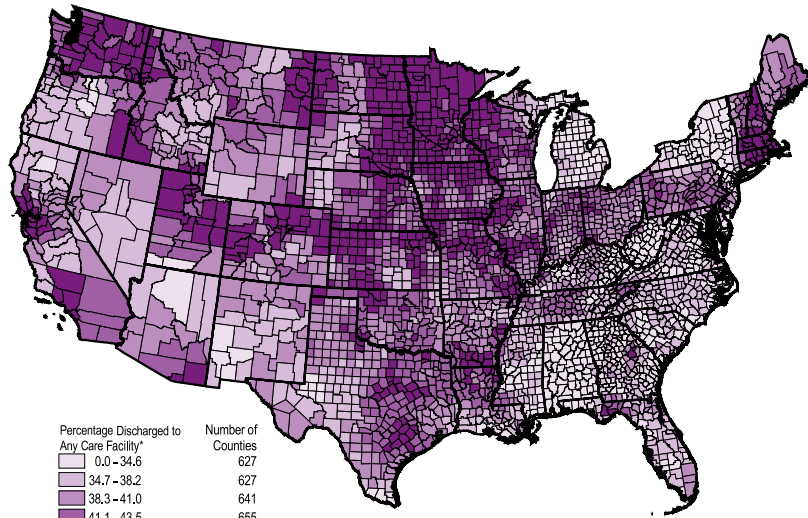
Percentage Discharged to Other Care Facility*	Number of Counties
0.0–14.5	633
14.6–17.1	654
17.2–19.4	617
19.5–22.9	638
23.0–35.7	640
Insufficient Data	5

**Other Care Facility**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

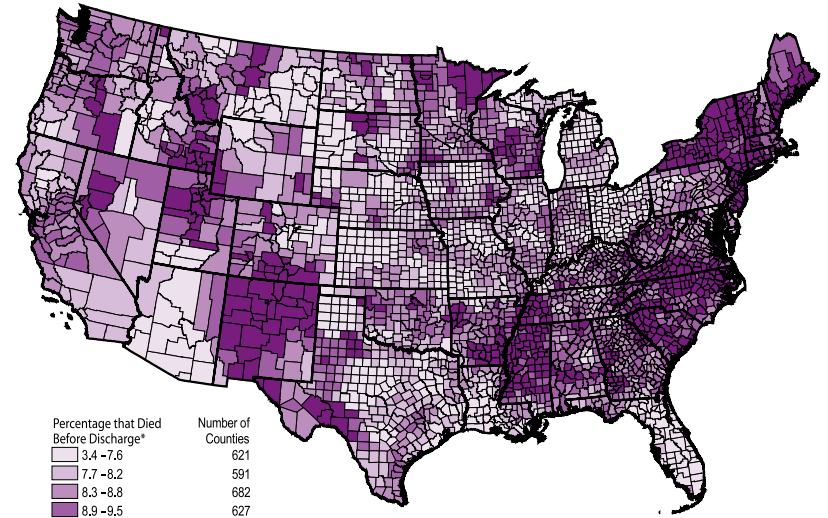
# Medicare Beneficiaries Ages 65 and Older 1995–2002

# Stroke Hospitalizations Discharge Status



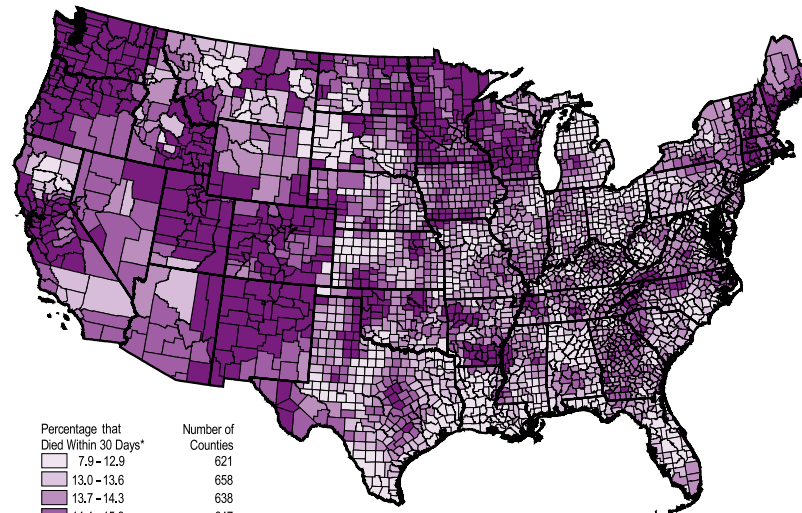
Percentage Discharged to Any Care Facility*	Number of Counties
0.0 - 34.6	627
34.7 - 38.2	627
38.3 - 41.0	641
41.1 - 43.5	655
43.6 - 59.0	634
Insufficient Data	3

**Discharged to Any Care Facility**



Percentage that Died Before Discharge*	Number of Counties
3.4 - 7.6	621
7.7 - 8.2	591
8.3 - 8.8	662
8.9 - 9.5	627
9.6 - 18.1	656
Insufficient Data	10

**Died Before Discharge**



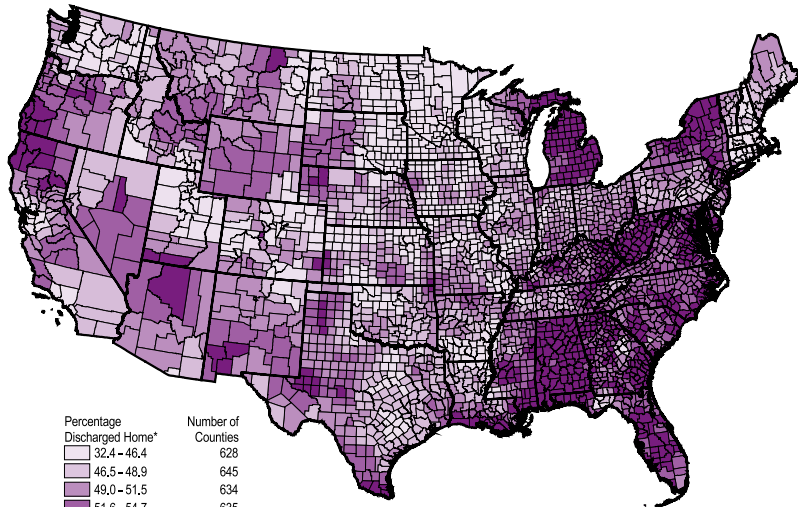
Percentage that Died Within 30 Days*	Number of Counties
7.9 - 12.9	621
13.0 - 13.6	658
13.7 - 14.3	638
14.4 - 15.3	647
15.4 - 23.0	616
Insufficient Data	7

**Died Within 30 Days**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

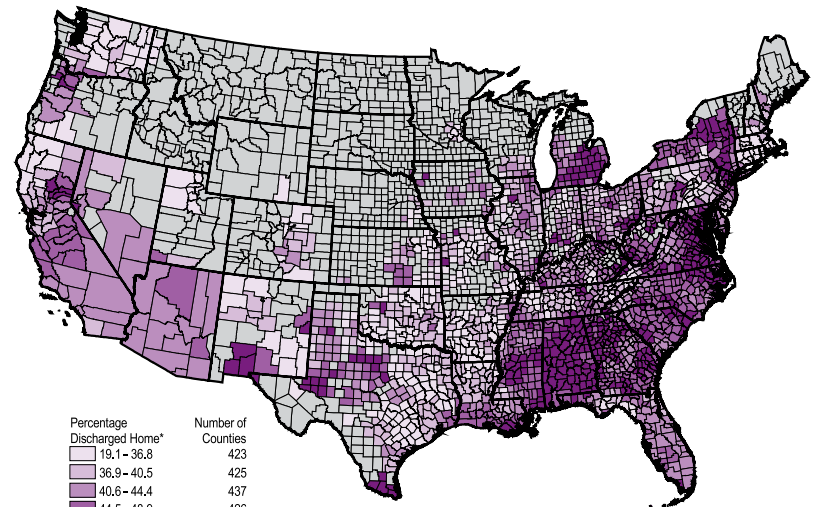
## Medicare Beneficiaries Ages 65 and Older 1995–2002

## Stroke Hospitalizations Discharged Home



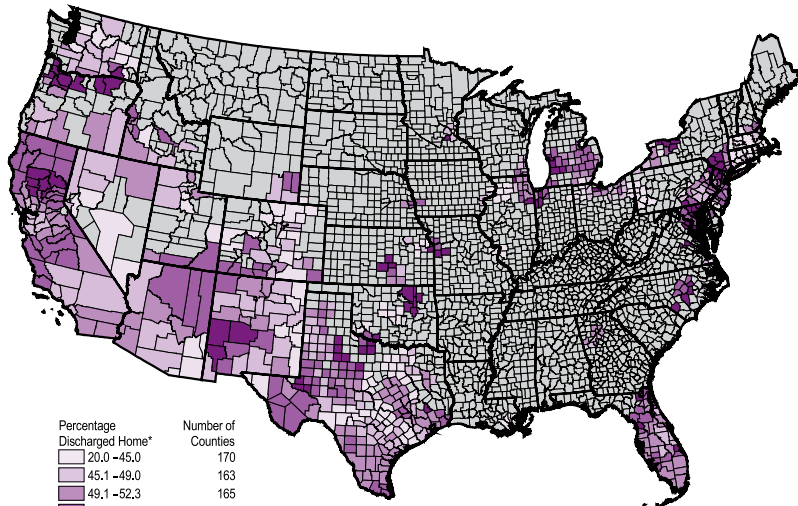
Percentage Discharged Home*	Number of Counties
32.4–46.4	628
46.5–48.9	645
49.0–51.5	634
51.6–54.7	635
54.8–96.3	642
Insufficient Data	3

**Total**



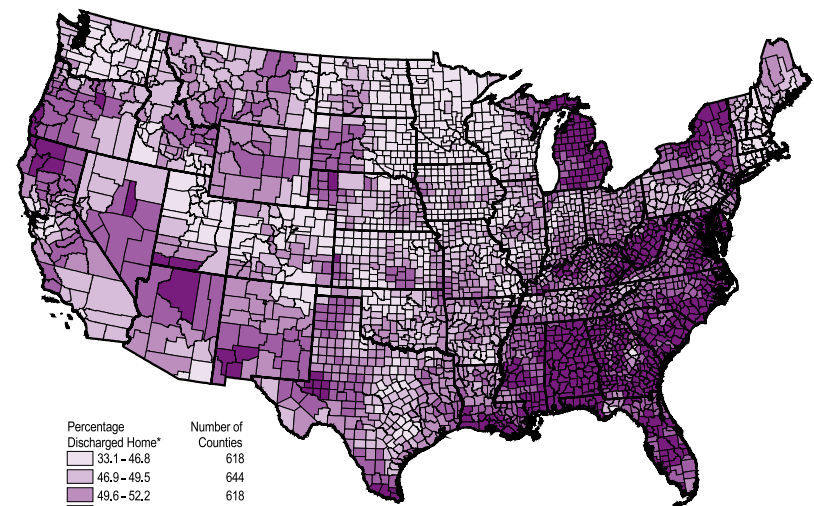
Percentage Discharged Home*	Number of Counties
19.1–36.8	423
36.9–40.5	425
40.6–44.4	437
44.5–48.9	426
49.0–95.9	433
Insufficient Data	1,043

**Blacks**



Percentage Discharged Home*	Number of Counties
20.0–45.0	170
45.1–49.0	163
49.1–52.3	165
52.4–58.9	163
59.0–93.2	166
Insufficient Data	2,360

**Hispanics**



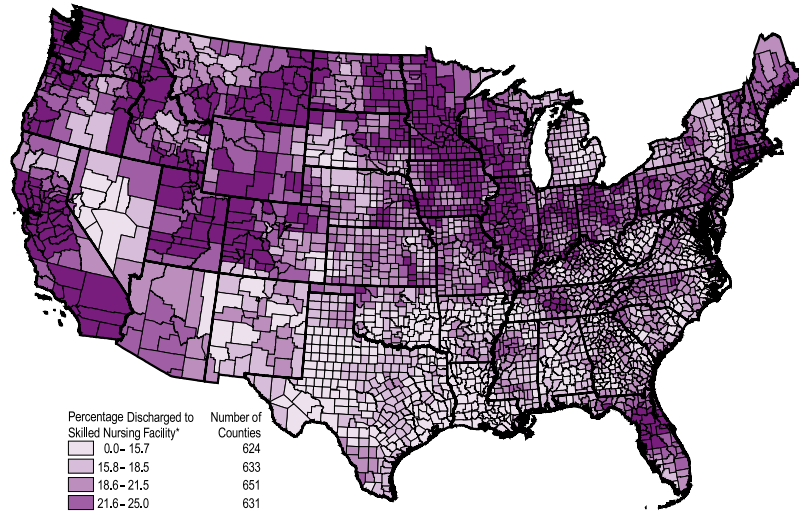
Percentage Discharged Home*	Number of Counties
33.1–46.8	618
46.9–49.5	644
49.6–52.2	618
52.3–55.8	636
55.9–95.6	666
Insufficient Data	5

**Whites**

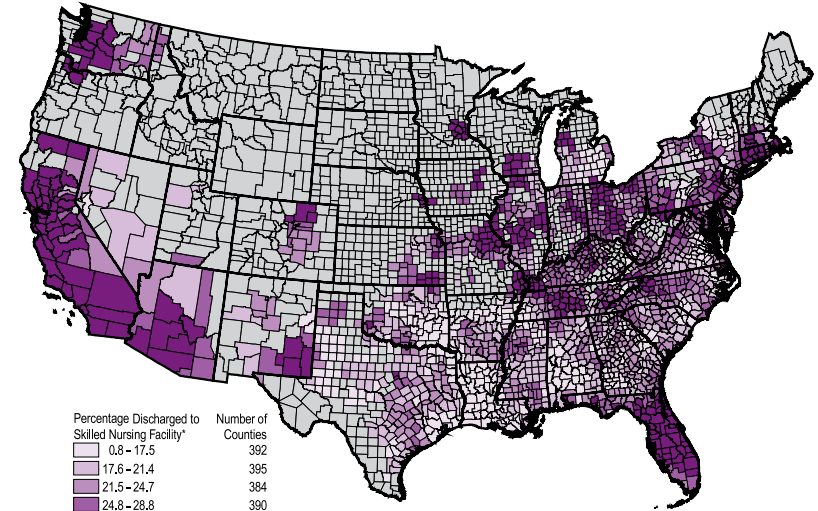
\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

## Medicare Beneficiaries Ages 65 and Older 1995–2002

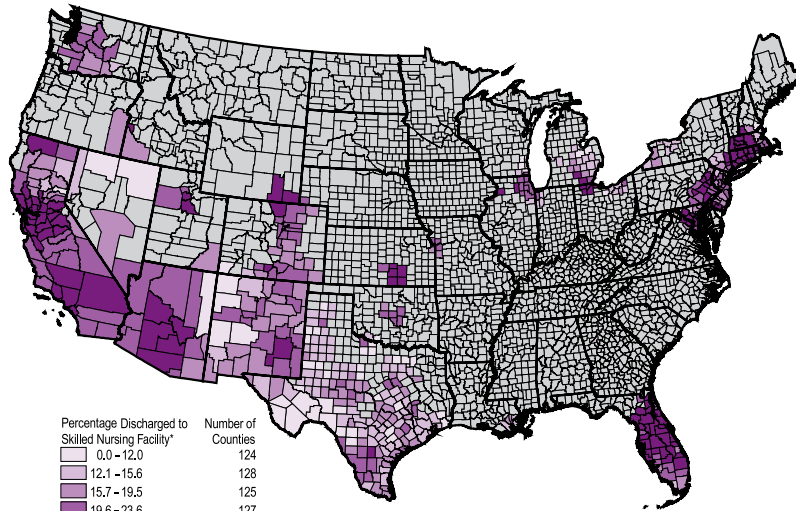
## Stroke Hospitalizations Discharged to Skilled Nursing Facility



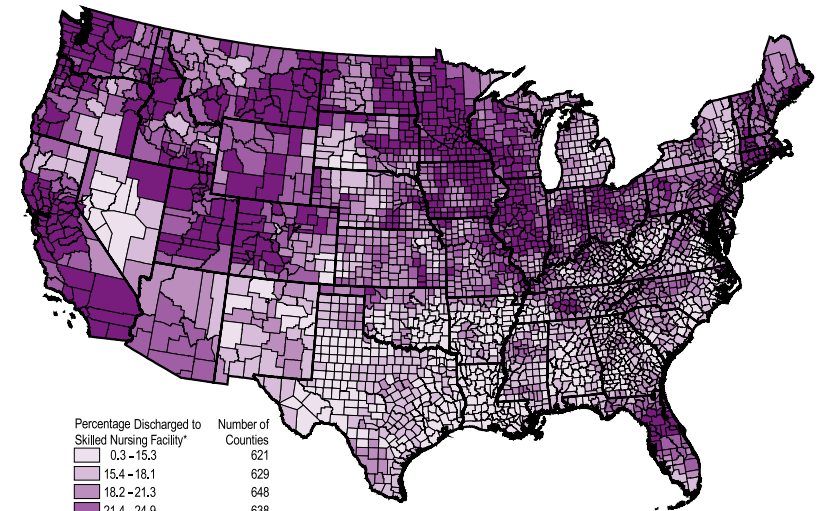
**Total**



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**Hispanics**

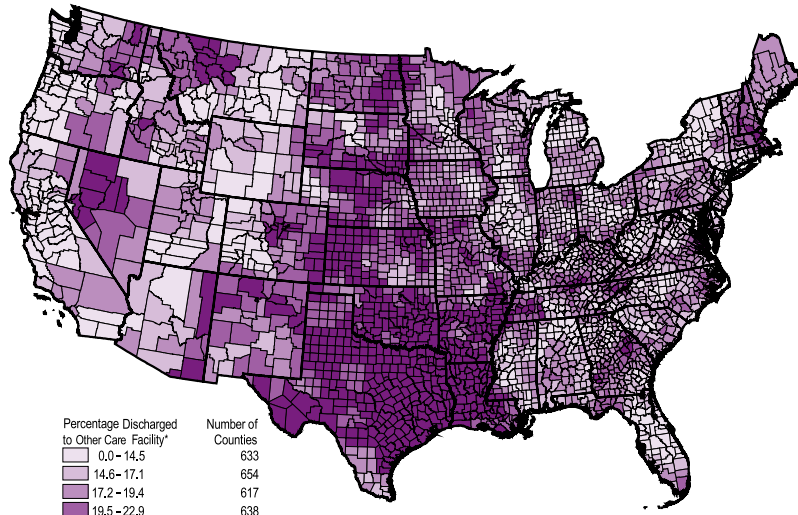


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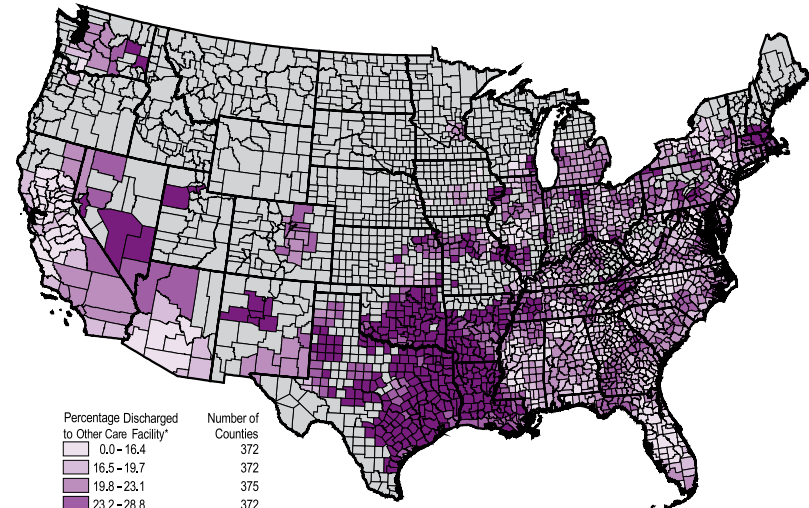
\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

## Medicare Beneficiaries Ages 65 and Older 1995–2002

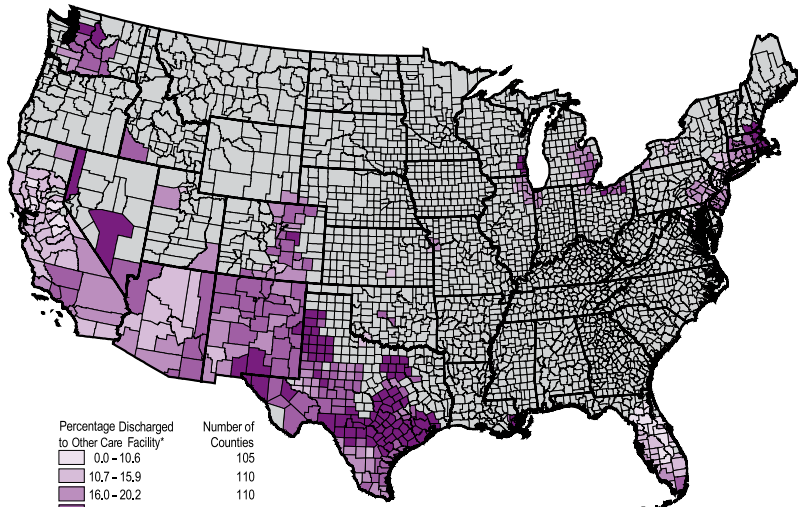
## Stroke Hospitalizations Discharged to Other Care Facility



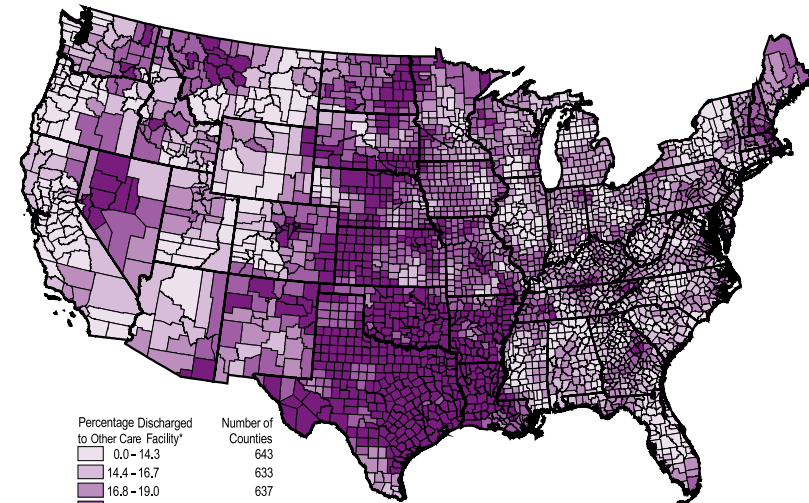
**Total**



**Blacks**



**Hispanics**

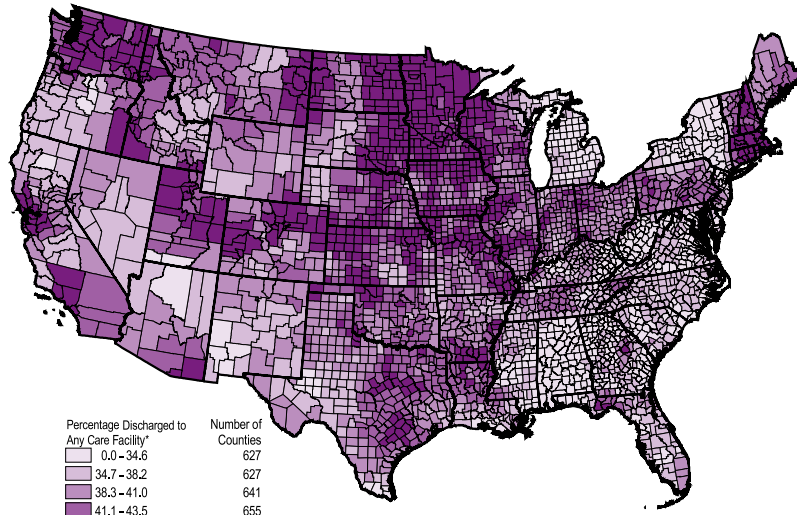


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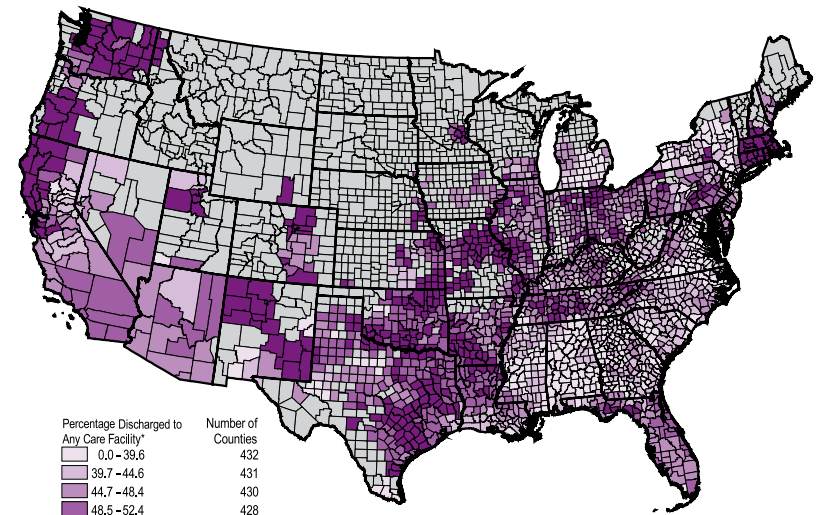
\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

# Medicare Beneficiaries Ages 65 and Older 1995–2002

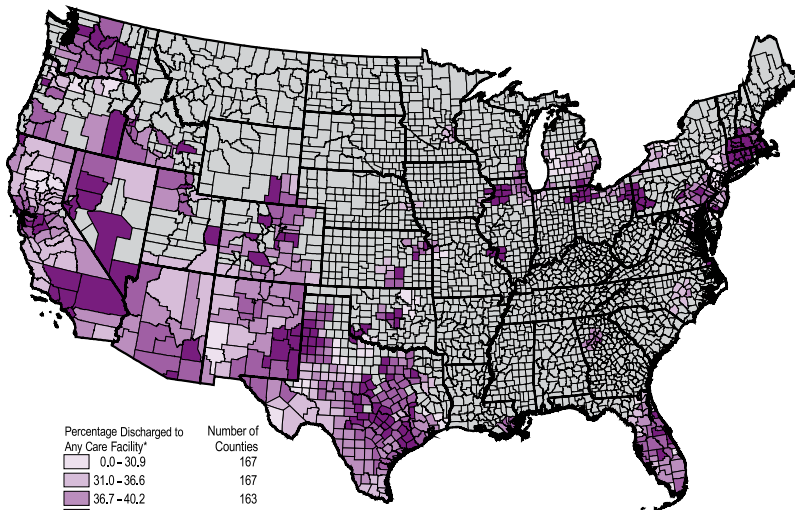
# Stroke Hospitalizations Discharged to Any Care Facility



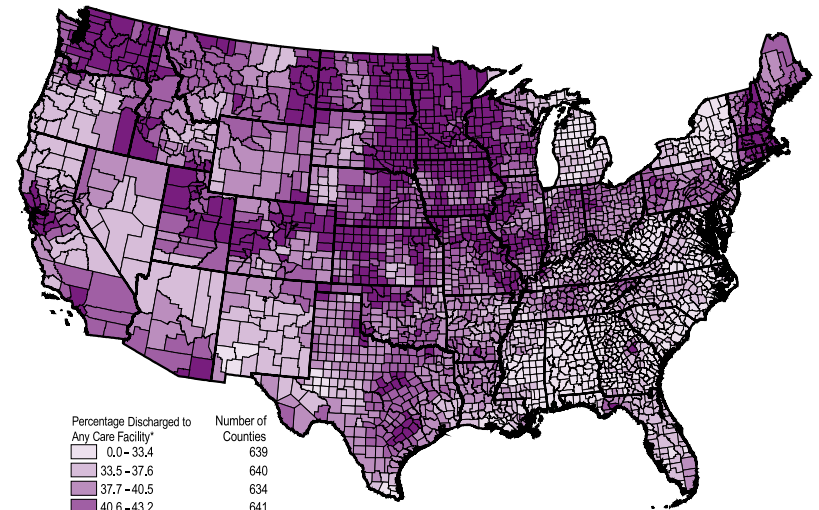
**Total**



**Blacks**



**Hispanics**



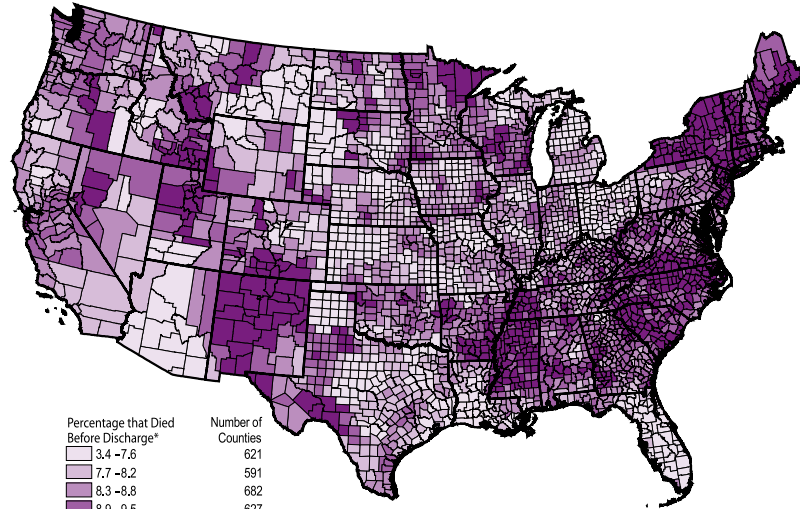
**Whites**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

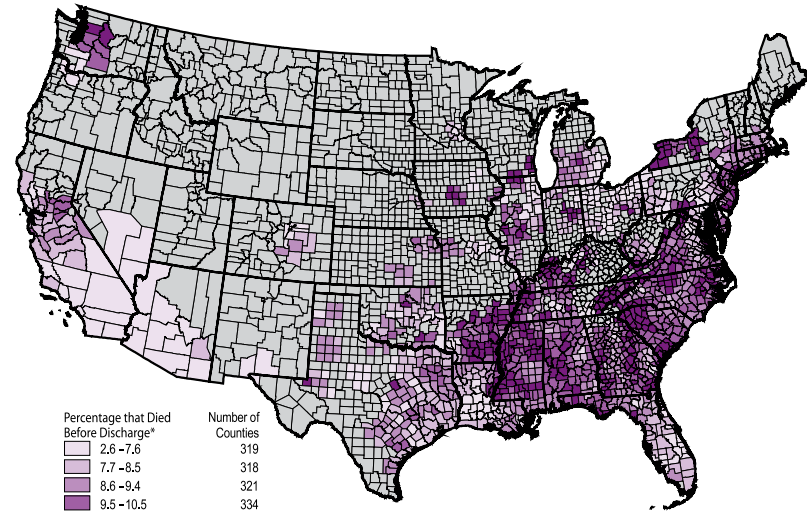


# Medicare Beneficiaries Ages 65 and Older 1995–2002

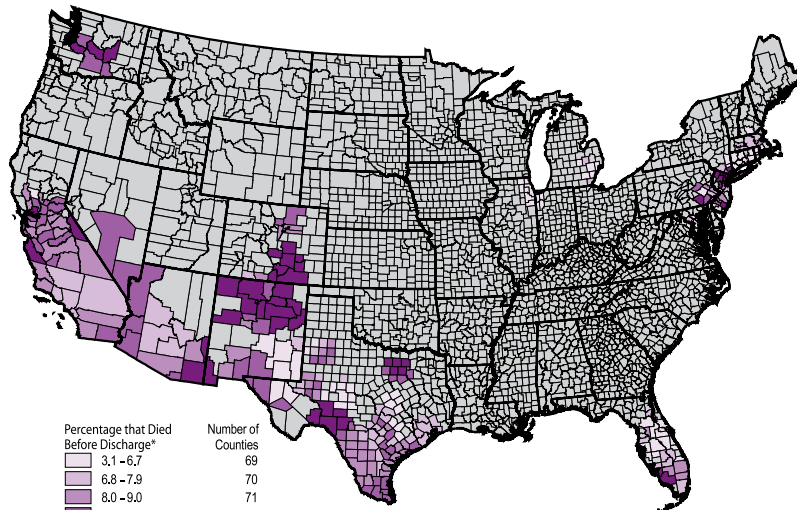
# Stroke Hospitalizations Died Before Discharge



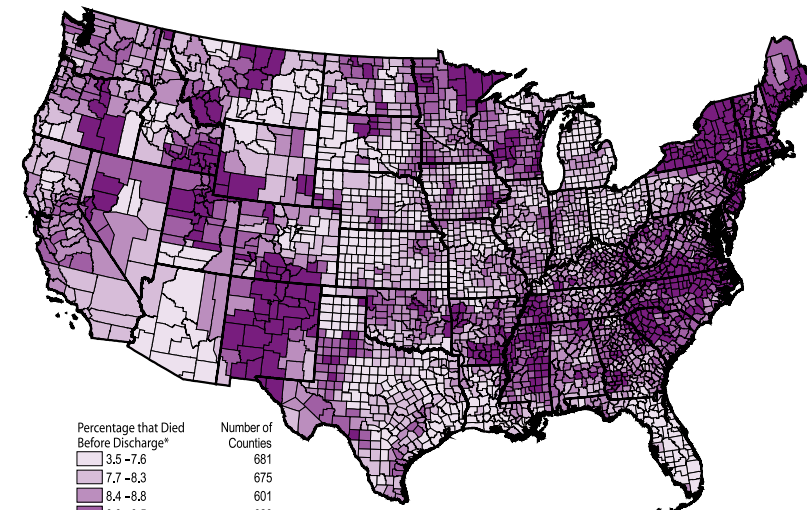
**Total**



**Blacks**



**Hispanics**

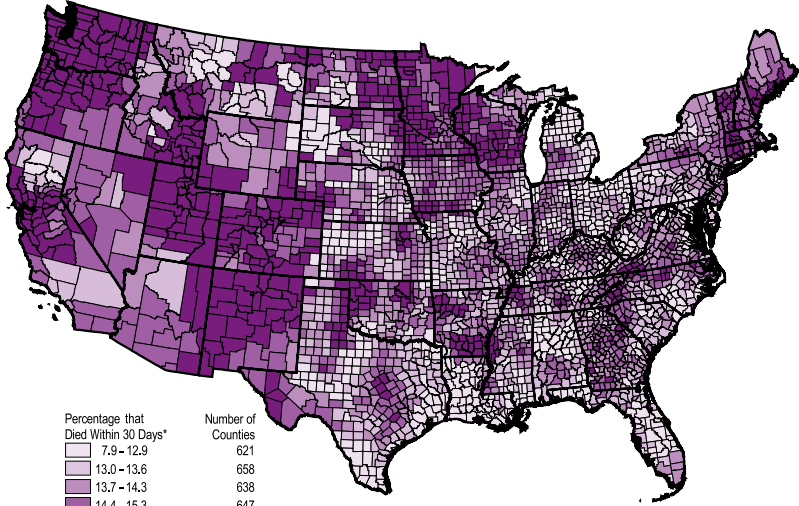


**Whites**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

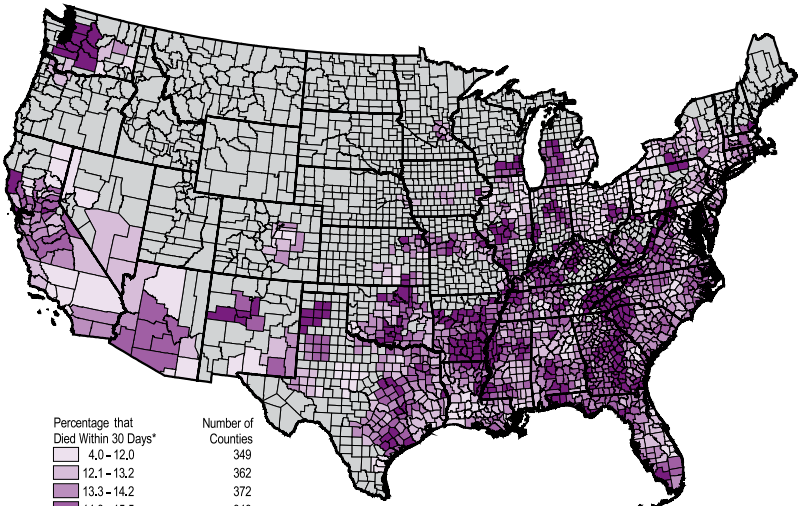
# Medicare Beneficiaries Ages 65 and Older 1995–2002

# Stroke Hospitalizations Died Within 30 Days



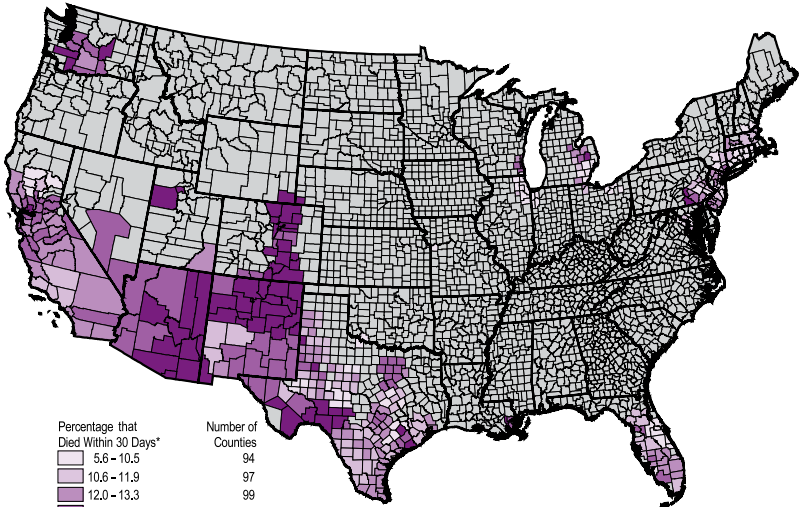
Percentage that Died Within 30 Days*	Number of Counties
7.9–12.9	621
13.0–13.6	658
13.7–14.3	638
14.4–15.3	647
15.4–23.0	616
Insufficient Data	7

**Total**



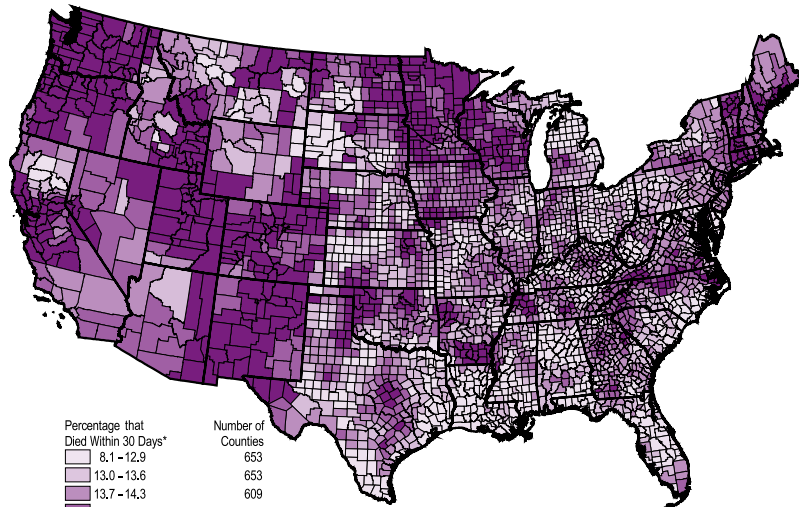
Percentage that Died Within 30 Days*	Number of Counties
4.0–12.0	349
12.1–13.2	362
13.3–14.2	372
14.3–15.5	348
15.6–27.7	357
Insufficient Data	1,399

**Blacks**



Percentage that Died Within 30 Days*	Number of Counties
5.6–10.5	94
10.6–11.9	97
12.0–13.3	99
13.4–15.4	95
15.5–17.3	100
Insufficient Data	2,702

**Hispanics**



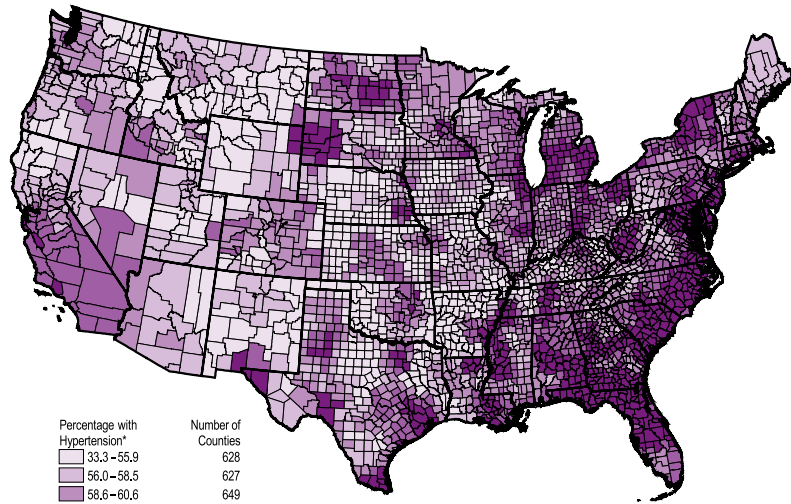
Percentage that Died Within 30 Days*	Number of Counties
8.1–12.9	653
13.0–13.6	653
13.7–14.3	609
14.4–15.3	627
15.4–27.2	630
Insufficient Data	15

**Whites**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

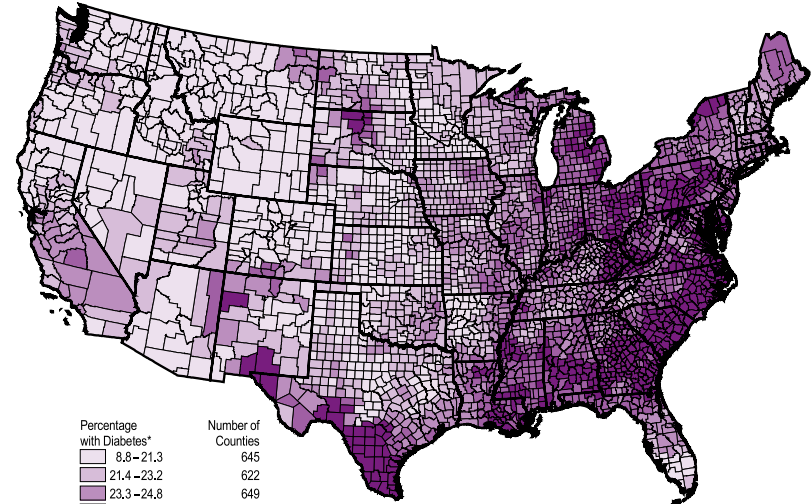
# Medicare Beneficiaries Ages 65 and Older 1995–2002

# Stroke Hospitalizations Selected Comorbidities



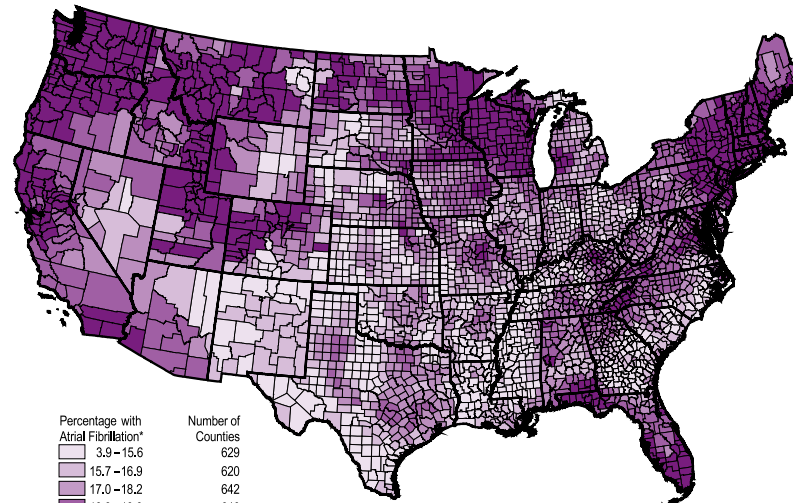
Percentage with Hypertension*	Number of Counties
33.3–55.9	628
56.0–58.5	627
58.6–60.6	649
60.7–62.8	641
62.9–73.2	639
Insufficient Data	3

**Hypertension**



Percentage with Diabetes*	Number of Counties
8.8–21.3	645
21.4–23.2	622
23.3–24.8	649
24.9–26.5	639
26.6–62.0	627
Insufficient Data	5

**Diabetes**



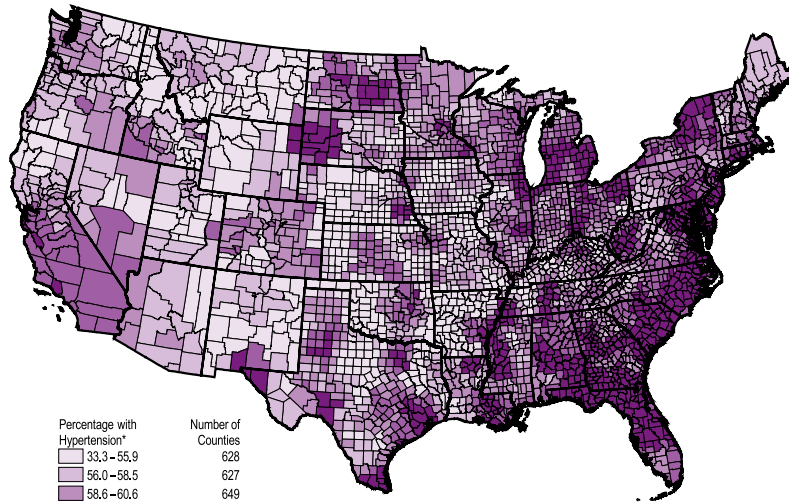
Percentage with Atrial Fibrillation*	Number of Counties
3.9–15.6	629
15.7–16.9	620
17.0–18.2	642
18.3–19.8	646
19.9–26.0	645
Insufficient Data	5

**Atrial Fibrillation**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

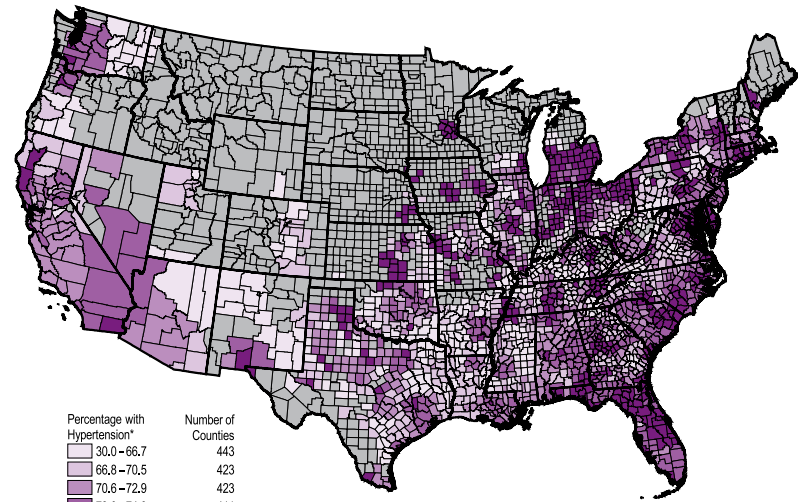
## Medicare Beneficiaries Ages 65 and Older 1995–2002

## Stroke Hospitalizations Hypertension



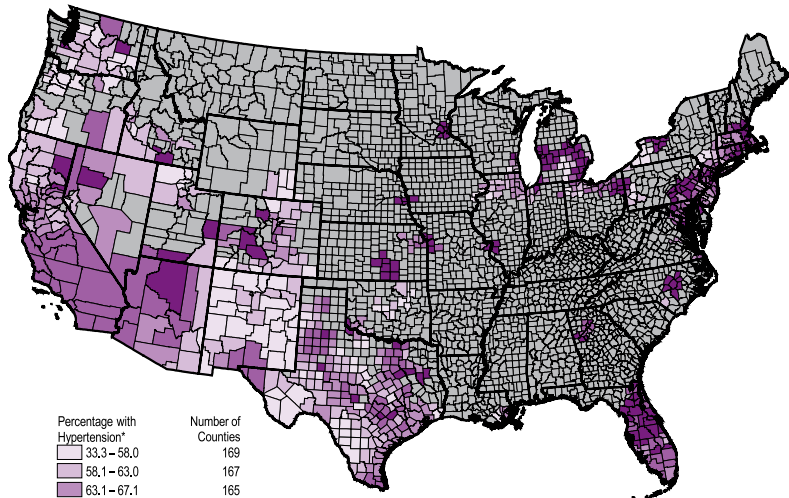
Percentage with Hypertension*	Number of Counties
33.3–55.9	628
56.0–58.5	627
58.6–60.6	649
60.7–62.8	641
62.9–73.2	639
Insufficient Data	3

**Total**



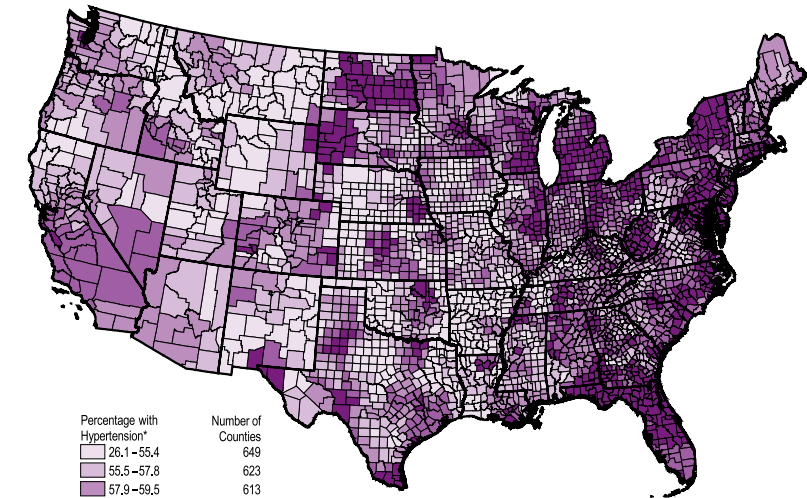
Percentage with Hypertension*	Number of Counties
30.0–66.7	443
66.8–70.5	423
70.6–72.9	423
73.0–74.9	411
75.0–92.6	444
Insufficient Data	1,043

**Blacks**



Percentage with Hypertension*	Number of Counties
33.3–58.0	169
58.1–63.0	167
63.1–67.1	165
67.2–70.7	163
70.8–100.0	163
Insufficient Data	2,360

**Hispanics**



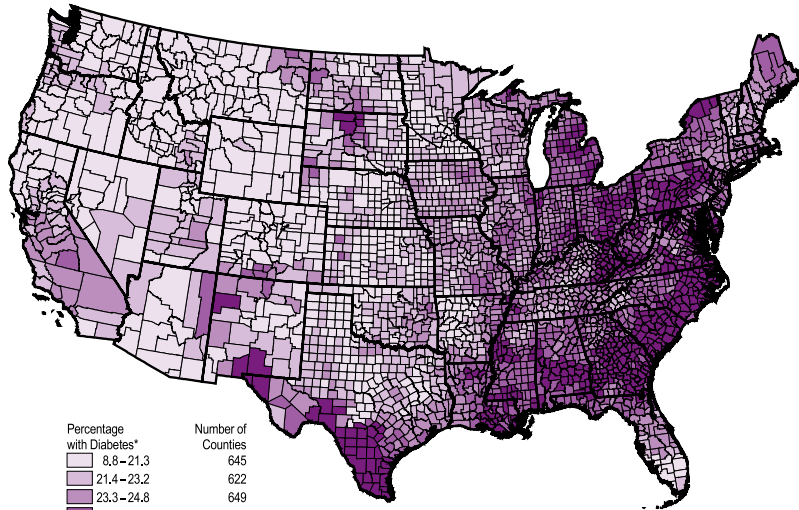
Percentage with Hypertension*	Number of Counties
26.1–55.4	649
55.5–57.8	623
57.9–59.5	613
59.6–61.3	654
61.4–80.0	643
Insufficient Data	5

**Whites**

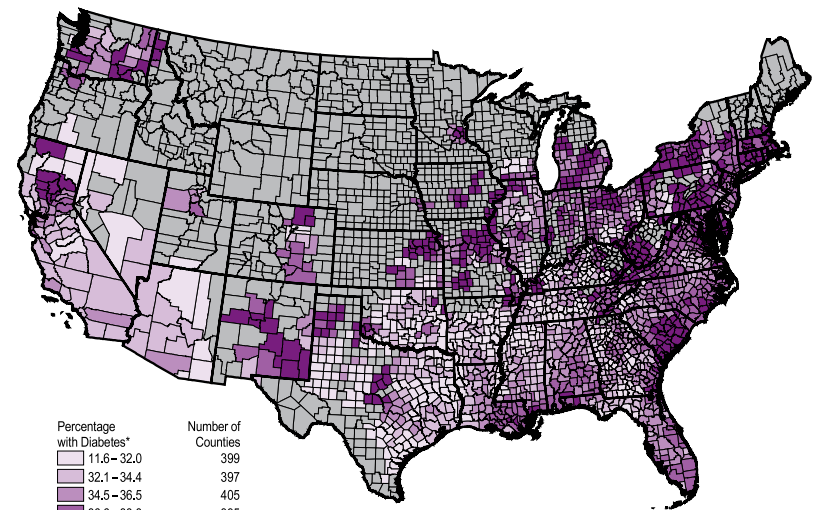
\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

# Medicare Beneficiaries Ages 65 and Older 1995–2002

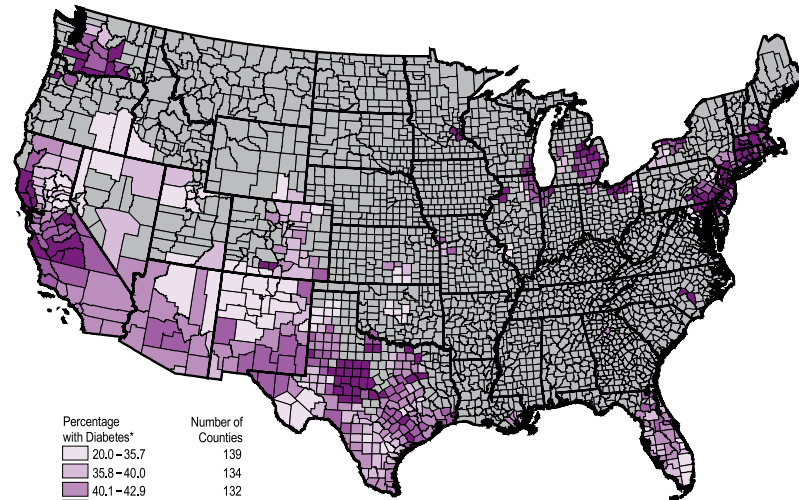
# Stroke Hospitalizations Diabetes



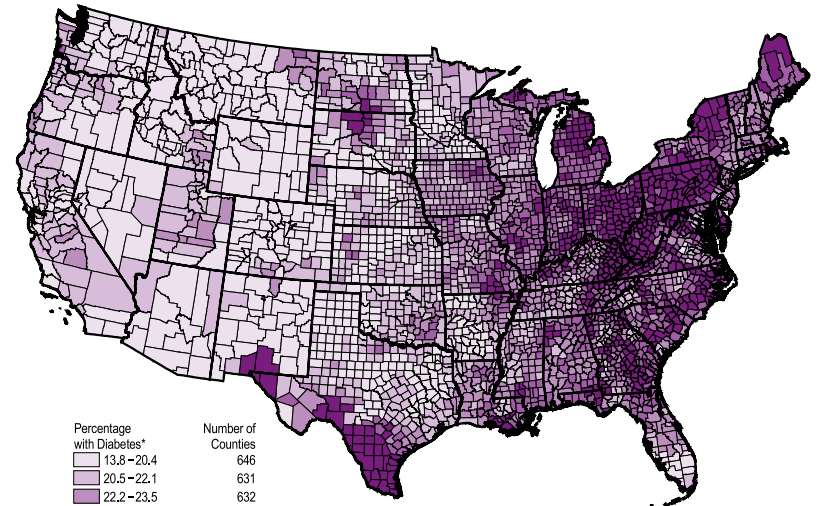
**Total**



**Blacks**



**Hispanics**

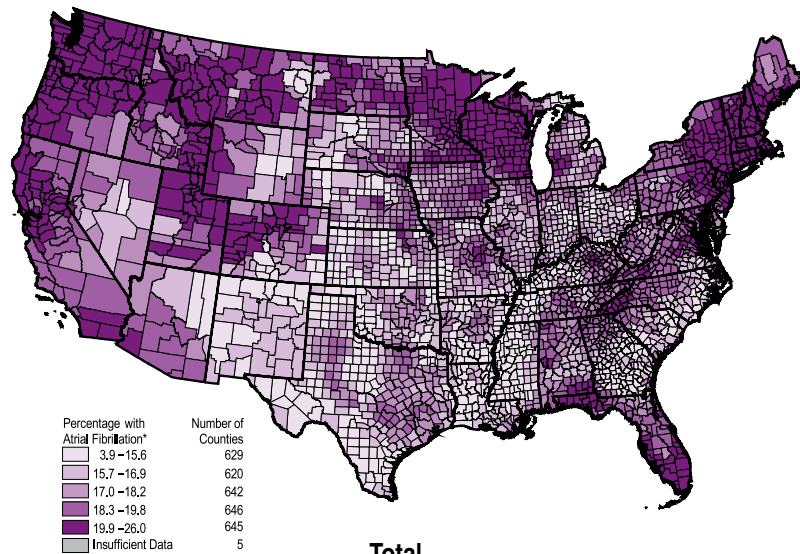


**Whites**

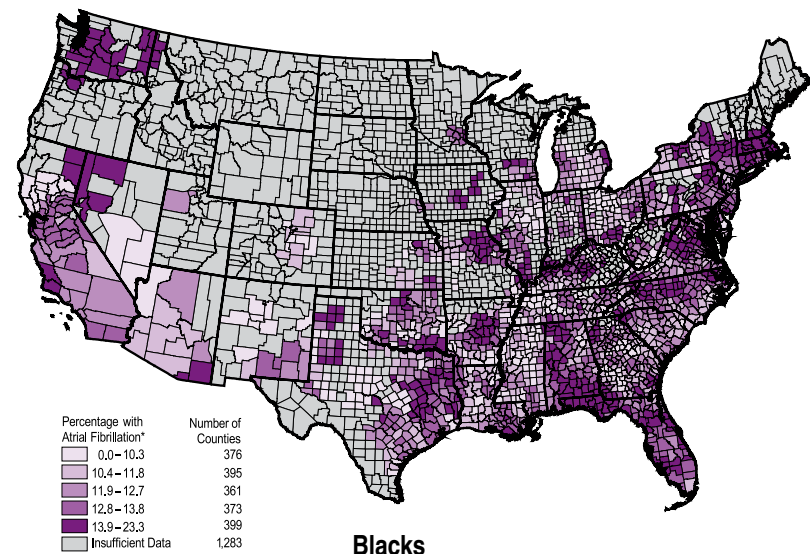
\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.

## Medicare Beneficiaries Ages 65 and Older 1995–2002

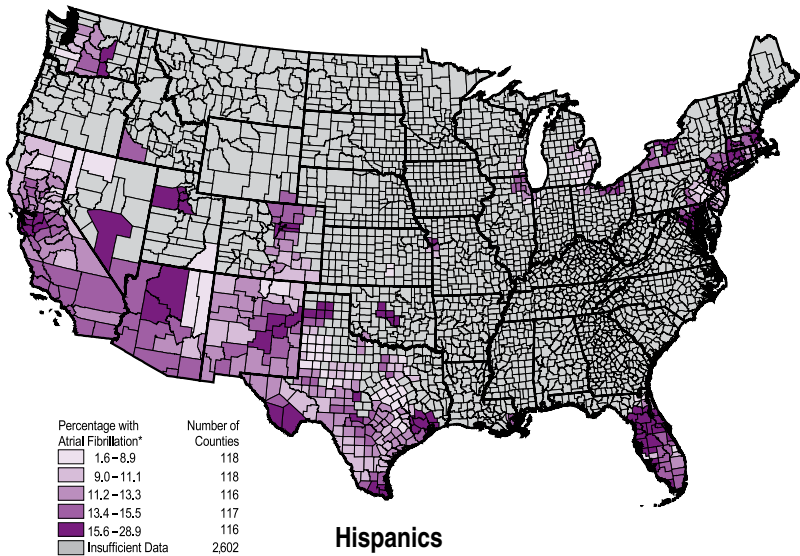
## Stroke Hospitalizations Atrial Fibrillation



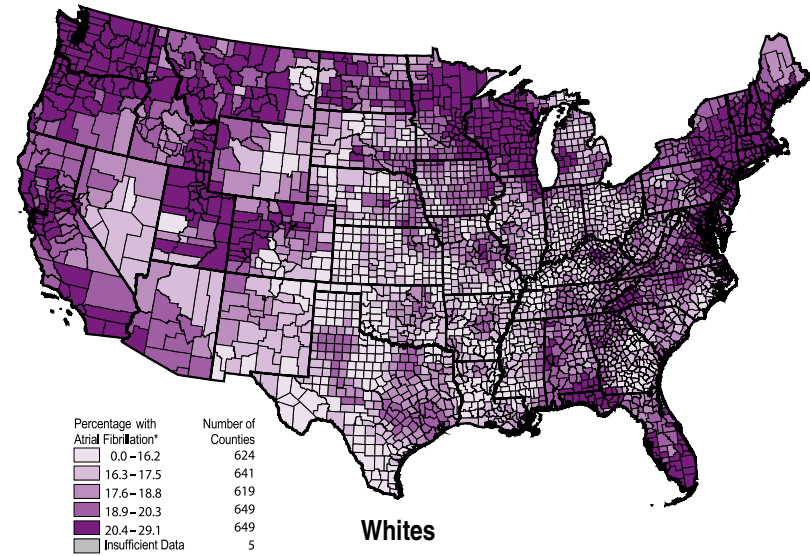
**Total**



**Blacks**



**Hispanics**



**Whites**

\* Percentages are spatially smoothed to enhance the stability of percentages in counties with small populations.