

## ***Geographic Patterns of Disability in the United States***

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Geographic patterns of county prevalence rates of disability benefit receipt are shown for the Social Security Administration's Disability Insurance (DI) and Supplemental Security Income (SSI) programs. Prevalence rates were calculated by dividing each county's December 1990 DI and SSI disability caseloads by the population aged 18-64 for that year in that county. Separate maps were also constructed for men and women recipients. Areas with the highest overall DI prevalence rates included Appalachia, the Southeast Coastal Plains, the Mid-south, northwestern Montana, the coastal counties of Washington, and isolated counties of the Southwest. Areas with the highest SSI prevalence rates included the Mississippi Delta, scattered counties in Oklahoma, the Missouri "Boot Heel," parts of Appalachia, isolated counties in South and North Dakota, the "Four Corners" region of the Southwest, the Sacramento and San Joaquin Valley regions of California, isolated parts of the upper Great Lakes States, northern Maine, and the coastal region of southwestern Alaska. Disability prevalence rates were also calculated for the overall population and by sex for each of the 10 U.S. Department of Health and Human Services administrative regions.

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This article provides an overview of the geographic distribution of county prevalence rates of disability benefit receipt under the Social Security Administration's Disability Insurance (DI) and Supplemental Security Income (SSI) programs. The accompanying maps and tables, which contain the supporting evidence for this article, represent counties ranked according to the prevalence of disability benefit receipt for men and women. In addition to the geographic distributions shown, tabular data are presented representing county distributions of the prevalence of disability by Department of Health and Human Services administrative regions.

The purpose of this article is to highlight local areas (counties) with high and low concentrations (prevalence rates) of disability program recipients. The maps and accompanying tables provide an indication of current and potential burdens for Social Security Administration (SSA) planners and program administrators. For example, knowledge of areas with high concentrations of DI and SSI disability beneficiaries could be used by agency administrative personnel and by public health officials to assess needs and availability of appropriate service modalities.

### ***Research and Policy Issues***

The geographic patterns shown are designed to raise both epidemiologic and policy questions. Why, for example, do certain areas of the United States have a relatively higher prevalence of disability and program participation than other areas? What are some of the contextual or geographic correlates of disability that may explain these patterns? Are there underlying sociodemographic explanations? Are certain employment patterns or mitigating ecological factors, including management practices, associated with certain industries and occupations that suggest higher or lower probabilities of disability? Are "pockets of poverty" and areas with above average unemployment associated with high rates of disability? Are differences in the prevalence of disability explained by local variations in the way SSA administers the DI and SSI programs? Are cyclical factors associated

**Table 1.—Disability Insurance beneficiaries per thousand persons aged 18-64, county quintile distribution by region, December 1990**

HHS region	Number of counties	Percent of counties	Total				
			Lowest 0.00 to 13.63	Second 13.64 to 17.52	Third 17.53 to 21.77	Fourth 21.78 to 27.34	Highest 27.35 to 102.80
United States	3,104	100	20	20	20	20	20
I Boston	67	100	22	43	22	9	3
II New York	83	100	12	33	41	14	0
III Philadelphia	251	100	17	14	22	26	21
IV Atlanta	736	100	4	8	13	29	46
V Chicago	524	100	18	24	27	21	10
VI Dallas	503	100	22	21	18	19	19
VII Kansas City	412	100	27	26	23	14	10
VIII Denver	291	100	40	27	16	11	6
IX San Francisco	95	100	44	26	16	6	7
X Seattle	142	100	36	20	23	13	8

HHS region	Number of counties	Percent of counties	Men				
			Lowest 0.00 to 18.96	Second 18.97 to 24.85	Third 24.86 to 31.04	Fourth 31.05 to 39.95	Highest 39.96 to 154.29
United States	3,104	100	20	20	20	20	20
I Boston	67	100	30	39	19	10	1
II New York	83	100	19	31	39	11	0
III Philadelphia	251	100	18	13	22	24	24
IV Atlanta	736	100	5	8	15	31	41
V Chicago	524	100	19	25	24	21	11
VI Dallas	503	100	17	19	19	20	24
VII Kansas City	412	100	26	29	22	12	11
VIII Denver	291	100	40	27	15	11	7
IX San Francisco	95	100	46	24	15	7	7
X Seattle	142	100	35	21	23	15	6

HHS region	Number of counties	Percent of counties	Women				
			Lowest 0.00 to 7.71	Second 7.72 to 9.87	Third 9.87 to 12.04	Fourth 12.05 to 15.13	Highest 15.14 to 139.53
United States	3,104	100	20	20	20	20	20
I Boston	67	100	15	33	31	13	7
II New York	83	100	1	17	48	29	5
III Philadelphia	251	100	11	24	26	21	19
IV Atlanta	736	100	3	9	13	25	51
V Chicago	524	100	12	26	29	24	9
VI Dallas	503	100	42	20	12	12	14
VII Kansas City	412	100	22	22	21	22	12
VIII Denver	291	100	42	22	17	14	4
IX San Francisco	95	100	33	42	13	7	5
X Seattle	142	100	32	24	25	15	4

with geographic patterns? Although these questions are not answered here, the presentation of a national geography of disability showing regional and local variations should raise further research and policy questions concerning the Social Security Administration's client populations and the milieus in which they live.

Patterns of area concentration among SSA disability program recipients were first recognized by Schmulowitz and Lynn (1966) and by McCoy and Weems (1989). In these studies reference was made to a "Disability Belt," which includes Appalachia, the Midsouth, and the Mississippi Delta regions. The fact that these regions with above average concentrations of disabled persons have persisted over time suggests that these areas with higher concentrations represent rather long lasting conditions associated with industrial, occupational, and sociocultural patterns.

Although a number of studies are concerned with demographic patterns associated with impairments and disabilities (U.S. Department of Health and Human Services 1989; LaPlante 1988), there are very few mapping applications that focus exclusively on the disabled, especially those who receive Federal benefits. With the exception of Haber's (1987) ecological analysis based on decennial census data that examined social and economic influences on self-reported disability at the State level, and McCoy and Weems' (1989) profile

**Department of Health  
Administrative**

I Boston: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island

II New York: New York, New Jersey

III Philadelphia: Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia

IV Atlanta: Kentucky, Tennessee, North Carolina, South Carolina, Alabama, Mississippi, Georgia, Florida

V Chicago: Minnesota, Michigan, Indiana, Ohio, Wisconsin, Illinois

analysis of disability program recipients, which included State level maps of prevalence rates, there are no other studies to our knowledge concerned with the regional geography and relative concentration of persons with disabilities at the county level of observation.

### Mapping Applications

Mapping technology has been applied in a number of public health areas and for the purpose of showing geographic distributions of agricultural, natural, and economic resources. The U.S. Public Health Service (PHS) has used mapping applications to identify areas with above average rates of cancer morbidity and mortality and areas with high rates of non-neoplastic diseases (Mason et al. 1975, 1981). More recently, the Centers for Disease Control of PHS used computer mapping to illustrate geographic patterns of major injury-related causes of mortality (Devine et al. 1991). Another application is used by the U.S. Department of Commerce (1990) to feature various characteristics of rural and farm populations. The Social Security Administration is currently using computer mapping to identify local (ZIP Code) concentrations of Old-Age, Survivors, and Disability Insurance (OASDI) beneficiaries who use the direct deposit program to send their benefit payments directly to financial institutions (Davis et al. 1991), and to demonstrate optimal allocations of man-

### and Human Services Regions

- VI Dallas: New Mexico, Texas, Oklahoma, Arkansas, Louisiana
- VII Kansas City: Nebraska, Iowa, Kansas, Missouri
- VIII Denver: Montana, North Dakota, South Dakota, Wyoming, Utah, Colorado
- IX San Francisco: California, Nevada, Arizona, Hawaii
- X Seattle: Washington, Oregon, Idaho, Alaska

Table 2.—Supplemental Security Income recipients per thousand persons aged 18-64, county quintile distribution by region, December 1990

HHS region	Number of counties	Percent of counties	Total				
			Lowest 0.00 to 8.01	Second 8.02 to 12.09	Third 12.10 to 17.28	Fourth 17.29 to 25.76	Highest 25.77 to 142.18
United States	3,104	100	20	20	20	20	20
I Boston	67	100	19	27	24	28	1
II New York	83	100	11	17	42	25	5
III Philadelphia	251	100	12	19	25	21	22
IV Atlanta	736	100	4	9	12	28	48
V Chicago	524	100	25	24	28	20	4
VI Dallas	503	100	13	18	20	25	22
VII Kansas City	412	100	33	31	19	9	8
VIII Denver	291	100	49	24	14	7	6
IX San Francisco	95	100	20	15	19	20	26
X Seattle	142	100	30	36	25	9	1

HHS region	Number of counties	Percent of counties	Men				
			Lowest 0.00 to 6.79	Second 6.80 to 10.66	Third 10.67 to 15.25	Fourth 15.26 to 22.70	Highest 22.71 to 148.73
United States	3,104	100	20	20	20	20	20
I Boston	67	100	16	31	19	31	1
II New York	83	100	7	20	37	29	6
III Philadelphia	251	100	14	20	23	21	23
IV Atlanta	736	100	4	10	14	26	46
V Chicago	524	100	24	23	27	21	6
VI Dallas	503	100	14	18	21	25	21
VII Kansas City	412	100	35	27	20	10	8
VIII Denver	291	100	48	23	13	7	8
IX San Francisco	95	100	22	11	17	22	28
X Seattle	142	100	30	39	24	7	1

HHS region	Number of counties	Percent of counties	Women				
			Lowest 0.00 to 9.24	Second 9.25 to 13.88	Third 13.89 to 19.51	Fourth 19.52 to 28.92	Highest 28.93 to 135.40
United States	3,104	100	20	20	20	20	20
I Boston	67	100	24	27	19	27	3
II New York	83	100	12	20	39	27	2
III Philadelphia	251	100	14	18	25	22	20
IV Atlanta	736	100	4	9	10	28	50
V Chicago	524	100	26	24	28	18	4
VI Dallas	503	100	13	18	22	26	21
VII Kansas City	412	100	33	30	20	10	7
VIII Denver	291	100	45	27	16	6	5
IX San Francisco	95	100	19	21	14	21	25
X Seattle	142	100	35	27	24	13	1

power and other resources for its district offices.

### *Program Overviews*

The 1956 amendments to the Social Security Act provided for Disability Insurance benefits starting in 1957. The DI program assists primarily the working population aged 18–64, and survivors of workers who meet SSA's definition of disability and insured status requirements. DI beneficiaries are a categorically distinct population with severe physical and mental limitations that have been medically and clinically documented in accordance with program eligibility criteria. To receive benefits, a disabled worker must be unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that is expected to result in death or to last for a continuous period of not less than 12 months. Eligible applicants must be fully and currently insured. Persons aged 31 or older, must have at least 1 quarter of coverage for each year after age 21, and must have at least 20 quarters of coverage in the last 40 quarters (or 5 of the last 10 years).

The Supplemental Security Income program, which was implemented in 1974, provides cash assistance for aged, blind, and disabled persons who have very little income and resources. The same definition of disability used to determine DI eligibility is also used to determine disability under the SSI program, after the income and resource requirements have been met. The two major important differences between the programs are that SSI is means-tested and does not require prior work experience, whereas DI is not means-tested and does require prior work experience. Unlike DI beneficiaries who are paid as retired workers once they reach age 65, disabled SSI recipients remain classified as disabled regardless of age.

### *Methods and Procedures*

We used the rate of DI and SSI disability program participation observed at

the county level as the unit of presentation. As Hoover et al. (1975) have noted, data aggregated at the county level rather than the State level are preferable because of the paucity of variation as a result of greater heterogeneity at the State level. Counties represent a compromise between units small enough to be demographically and ecologically homogeneous and those that are large enough to provide stable estimates.

There are approximately 3,125 counties in the United States, depending on how independent cities—which are primarily located in Virginia—are classified. In the present analysis, all independent cities in Virginia were merged with their contiguous counties, and this resulted in a final total of 3,104 counties. For example, in northern Virginia, data pertaining to the independent cities of Falls Church and Fairfax City were merged with that of Fairfax County.

County disability prevalence rates were calculated by dividing each county's DI or SSI disability caseload that was in active payment status in December 1990, by the county's population of persons aged 18–64 for that year. Beneficiaries who were concurrently receiving benefits because of their eligibility in both programs are represented here with the SSI-only population. All denominator data are based on the latest population estimates derived from the decennial census of 1990. Prevalence rates for each county were calculated separately for the DI and disabled SSI populations (total, men, women).

The SSI disability caseload distribution used in the calculations was limited to the population aged 18–64 for comparability with the DI program guidelines, and, as noted above, includes persons who were concurrently receiving benefits under both programs. Concurrent beneficiaries represent approximately 30 percent of the disabled SSI population aged 18–64. As noted, DI beneficiaries who reach age 65 are automatically transferred to the OASI part of the program, whereas disabled SSI recipients remain categorically disabled regardless of their age.

Each county was subsequently assigned a national quintile rank score for

each of the aforementioned groups. Quintile scores are shown in the maps ranging from the highest ranked counties—that is, from the heaviest concentrations of disability program participants (shown by the darkest contrast), to the lowest ranked counties with the lowest rates of program participation (shown by the lightest contrast). Separate maps based on quintile ranks are also presented for men and women who receive disability benefits under the SSA programs.

The tables contain quintile rank distributions for the overall disabled populations (DI and SSI) and distributions by sex for each of the 10 U.S. Department of Health and Human Services administrative regions. Quintile “cutting point” ranges vary for each program category according to the national distribution of cases. For example, for the overall DI prevalence rates shown in table 1, the lowest quintile group included counties with rates ranging from 0.0–13.63 per thousand. In contrast, counties ranked in the highest quintile had rates ranging from 27.35 per thousand to 102.80 per thousand. For further information concerning cutting point quintile ranges for each program category, see the legend information accompanying the maps.

### *Geographic Distributions*

County concentrations showing regional disability prevalence rates for the DI population are presented in charts 1–3. Areas with the highest overall prevalence rate included: Appalachia (parts of West Virginia, Virginia, Kentucky, and Tennessee), counties scattered throughout the Southeast Coastal Plains (parts of North and South Carolina), and areas of the Midsouth, (including Arkansas, Mississippi, the “Boot Heel” of southeastern Missouri, and counties in southeastern Oklahoma). In the West, areas of high DI prevalence were located in northwestern Montana, the coastal counties of Washington, and in isolated counties of the Southwest, primarily in Arizona, New Mexico, and Colorado.

The distribution of areas with a low disability prevalence are in sharp contrast to those with a high disability prevalence. Low prevalence rates were found in many of the counties in the Western United States including those in the Dakotas, Wyoming, Utah, and Colorado, as well as the Midwestern States of Kansas and Nebraska, and most of Texas. There were no discernible differences in county patterns of DI benefit receipt by sex.

County distributions of the SSI disabled population are shown in charts 4–6. Areas with the highest prevalence rates were located in the Mississippi Delta in counties adjacent to the Mississippi River in Arkansas, Louisiana, and in most of the counties of Mississippi; in scattered counties of Oklahoma; and the “Missouri Boot Heel.” Other high prevalence areas include the Kentucky, West Virginia, and southwestern counties of Virginia in Appalachia; parts of Alabama and Georgia; and isolated counties in South and North Dakota including reservations for Native Americans. Other high prevalence areas are represented in the “Four Corners” region of the Southwest for adjacent counties of New Mexico, Arizona, Colorado, and Utah; in the far West by the Sacramento and San Joaquin Valley regions of California southward to Fresno; in isolated parts of the upper Great Lakes States; and in northern Maine and the coastal region of southwestern Alaska.

There are some interesting pattern differences between DI and SSI disability prevalence. The central valley area of California, for example, emerges as a region with high SSI prevalence but contrastingly low DI prevalence. A similar pattern was also observed for Alaska. In contrast, the disability belts of Appalachia and selected areas of the Eastern United States continue to have parallel patterns for both DI and SSI prevalence.

### *Federal Region Distributions*

Quintile rank comparisons distributed by Federal region for the DI program are shown in table 1. The Atlanta region outranked all others in the percentage of counties with the highest

prevalence rates of DI beneficiaries. Almost half (46 percent) of this region’s counties were in the highest quintile for the overall DI caseload. In contrast, both the San Francisco and Denver regions had the largest proportions of counties ranked in the lowest quintile—44 percent and 40 percent, respectively. Seattle was also among the lowest ranked regions of DI prevalence, with approximately a third of its counties ranked in the lowest quintile (36 percent).

There were also some interesting contrasts in the distributions by sex. The Atlanta region outranked all other regions in the percentage of counties with the highest prevalence rate for female recipients. About half (51 percent) of its counties were ranked in the highest quintile, compared with four in ten (41 percent) ranked in the highest quintile for men. In sharp contrast, almost half (46 percent) of San Francisco’s counties were ranked in the lowest quintile for male beneficiaries, compared with about a third (33 percent) ranked in the lowest quintile for women. The Dallas region also had a striking contrast by gender with 42 percent of its counties ranked in the lowest quintile for women, compared with 17 percent for men.

Quintile rank distributions for the SSI disability program are shown in table 2. Paralleling the DI quintile distributions, almost half (48 percent) of the Atlanta region’s counties were also ranked in the highest quintile of SSI disabled beneficiaries. The Atlanta region also has a large proportion of counties ranked in the highest quintile among female beneficiaries (50 percent), although the rate for men ranked in the highest quintile was somewhat lower (46 percent). In contrast, the region with the highest proportion of counties in the lowest quintile was Denver (49 percent), followed by Kansas City (33 percent), and Seattle (30 percent). There were no differences in geographic patterns by gender, except for the Boston region in which 24 percent of its counties were ranked in the lowest quintile for women, compared with 16 percent for men.

### *Discussion*

Rates of disability are affected by both the size of the numerators used in the calculations (that is, active DI and SSI disability program recipients) and the size of the total population (that is, county population and the number of men and women aged 18–64). Several things can determine the size and composition of the active caseload in a local area. Among these, for example, are employment in hazardous or physically demanding occupations, county concentration of extractive industries (such as mining), certain types of manufacturing (such as food processing and meat packing), agricultural production, and local economic conditions (such as pervasive and chronic poverty). Factors that may also influence the size and composition of an area’s population at a given point in time include the in and out migration of certain groups (such as younger, more functionally able persons), and recent retirees, including persons nearing retirement age.

An equally important consideration is the overall stability of area disability prevalence over time. Many areas of the United States have consistently manifested high rates of disability that correspond to areas representing long lasting “pockets of poverty” and chronic underemployment. The “Disability Belt” of the Eastern United States perhaps best illustrates a persistent lack of economic progress and development that has come to characterize Appalachia and the Mississippi Delta.

Furthermore, as noted earlier, there is a parallel distribution of DI and SSI disability program prevalence rates in many parts of the country. This parallel structure is most immediately recognizable in the Atlanta region in which 46 percent and 48 percent of its counties were ranked in the highest quintile for DI and SSI disability, respectively. It is interesting to note that in this region there are large parts of the aforementioned disability belt that includes the States of Kentucky, Mississippi, Alabama, and the Carolinas. In sharp contrast is the parallel distribution at the other end of the disability continuum of

very low prevalence rates typified by the Denver region with 49 percent of its counties in the lowest quintile of SSI disabled recipients and 40 percent in the lowest quintile of DI beneficiaries.

Further mapping applications and epidemiologic investigations could possibly uncover some of the probable correlates of disability. Carefully designed epidemiologic and comparative studies of residents of the high and low prevalence areas or studies of areas where there is a divergence of patterns between the programs could potentially prove very useful to further the understanding of the causal nexus of the impairment process, and the local contextual circumstances of the disabled population.

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Chart 1.—Disability Insurance beneficiaries per thousand persons aged 18–64 by county, December 1990

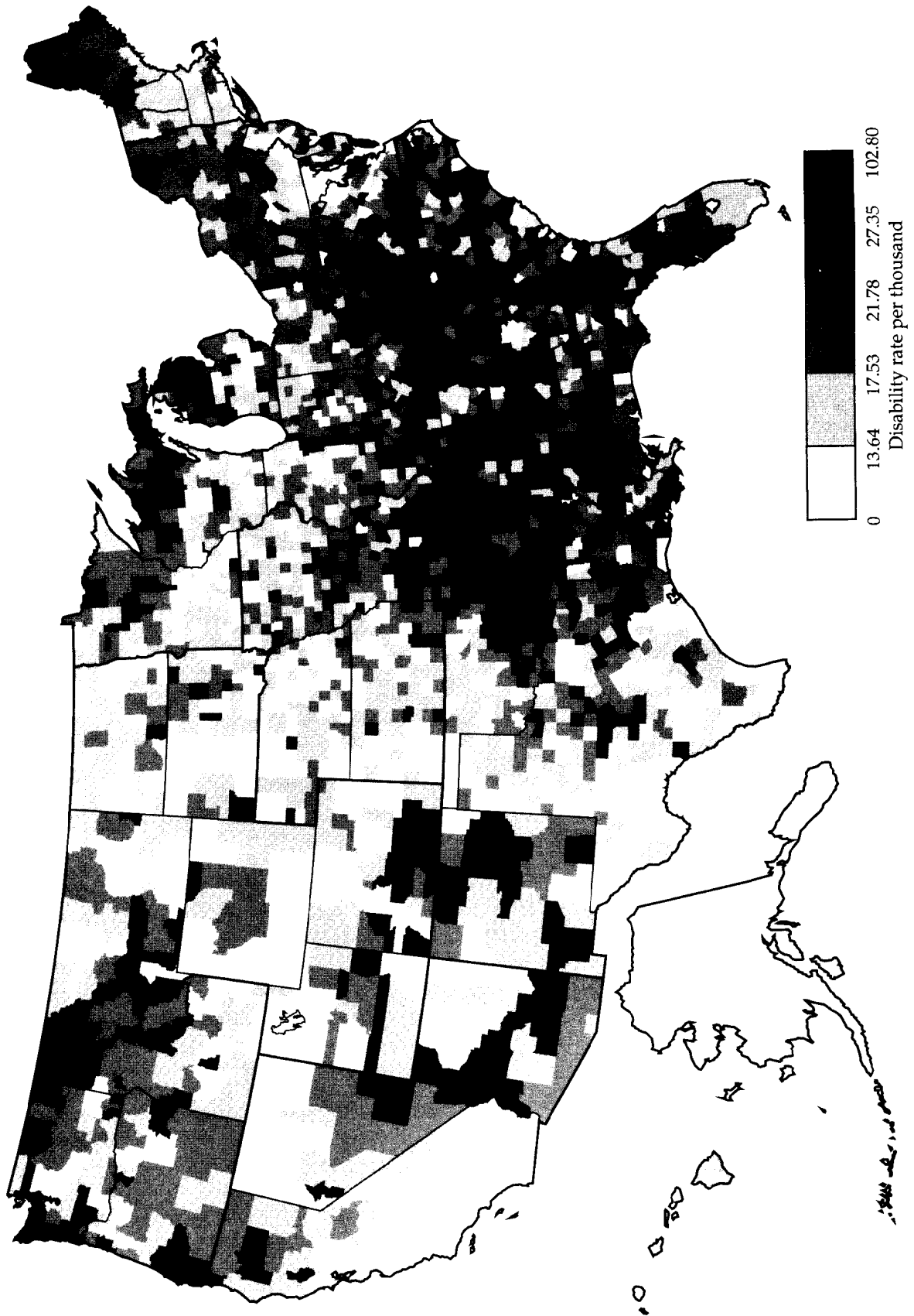


Chart 2.—Disability Insurance beneficiaries per thousand men aged 18–64 by county, December 1990

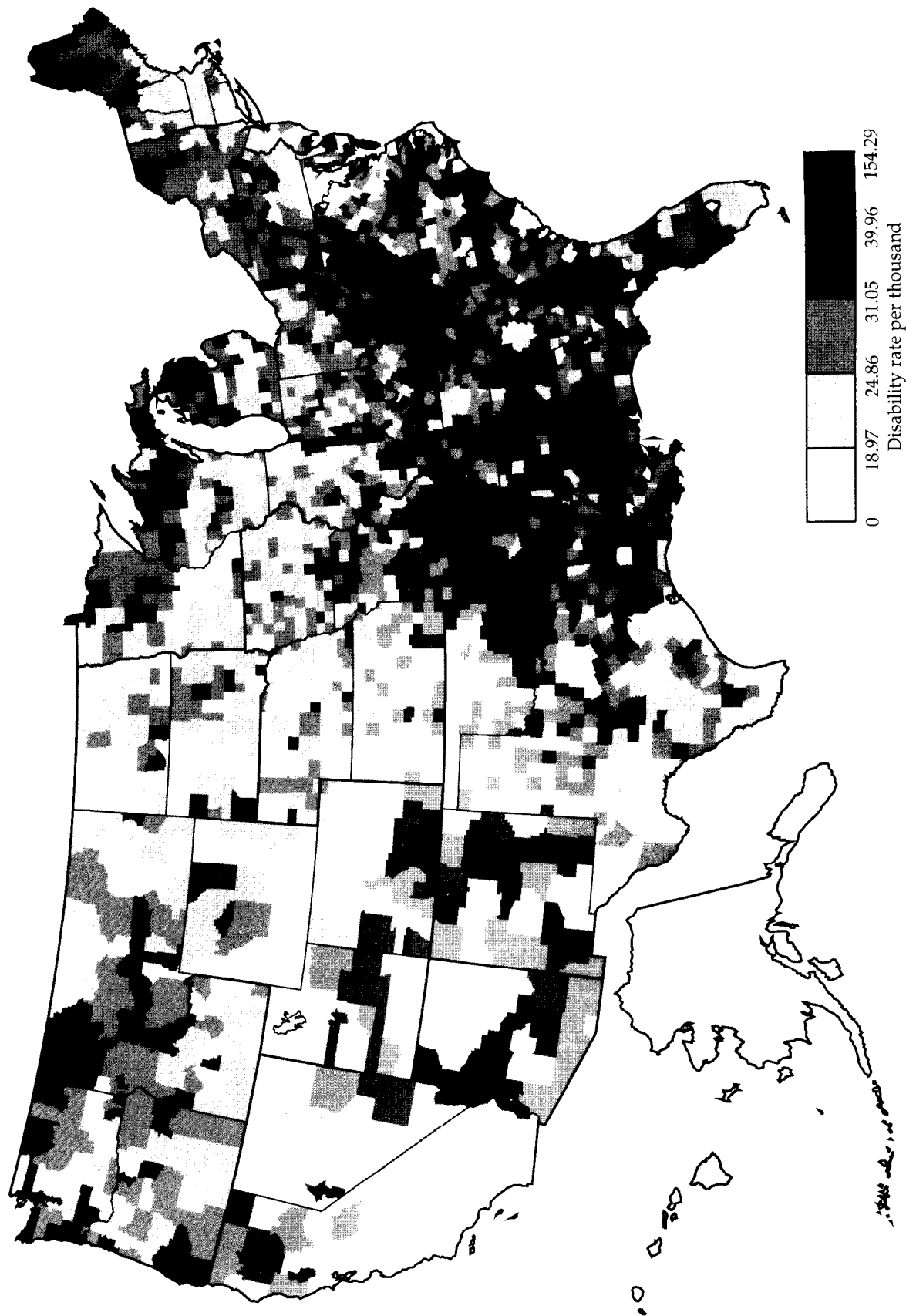




Chart 3.—Disability Insurance beneficiaries per thousand women aged 18–64 by county, December 1990

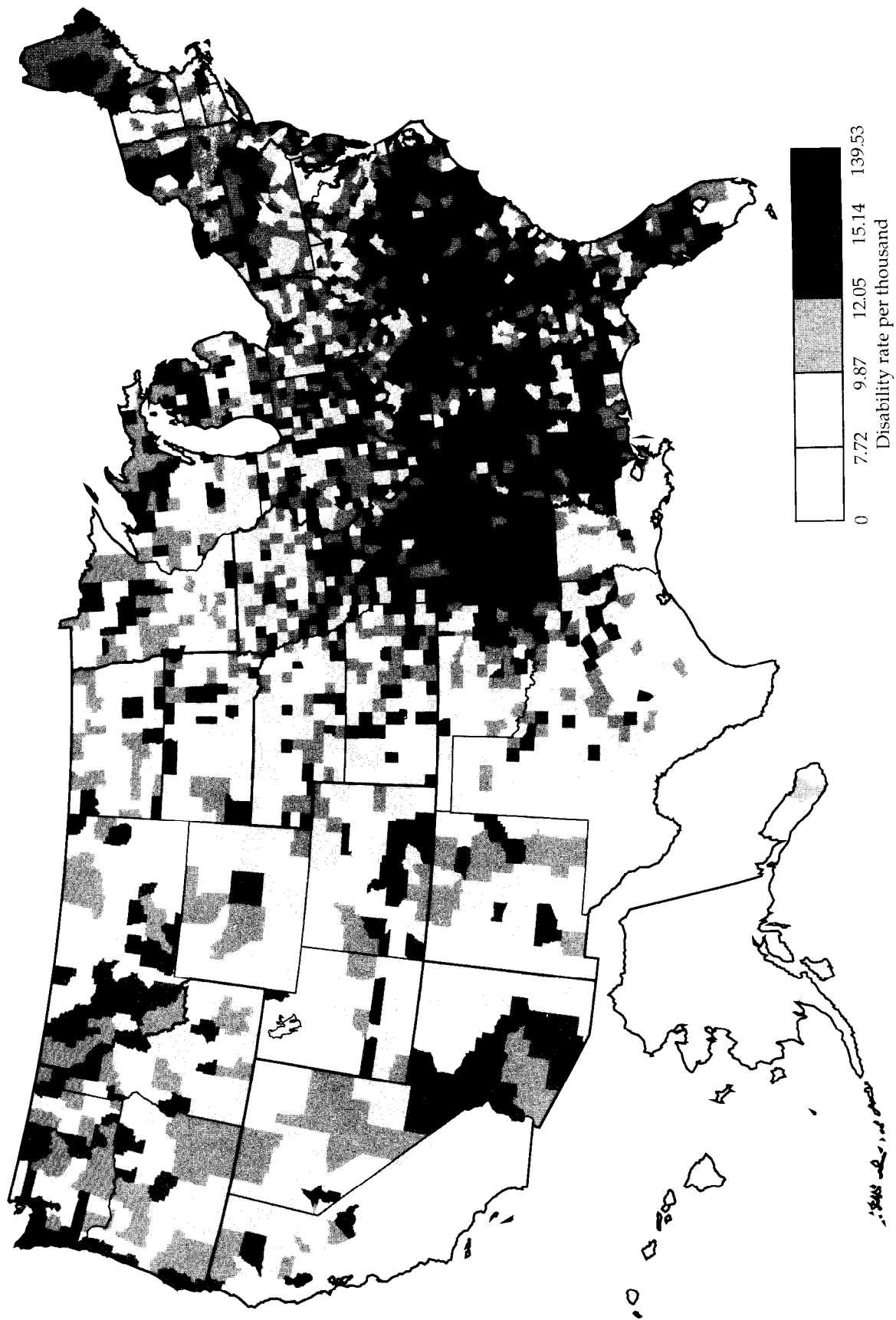


Chart 4.—Supplemental Security Income recipients per thousand persons aged 18–64 by county, December 1990

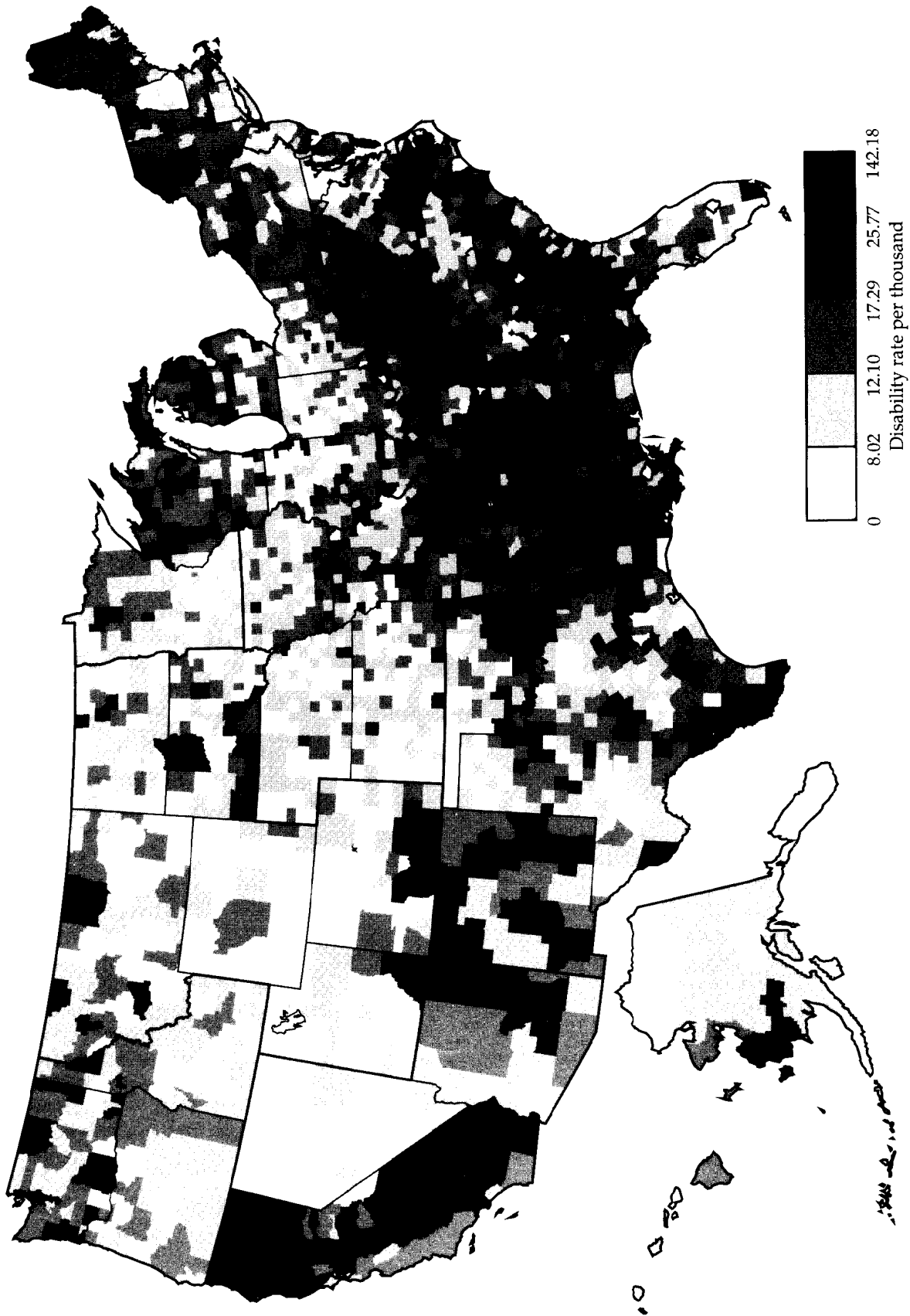


Chart 5.—Supplemental Security Income recipients per thousand men aged 18–64 by county, December 1990

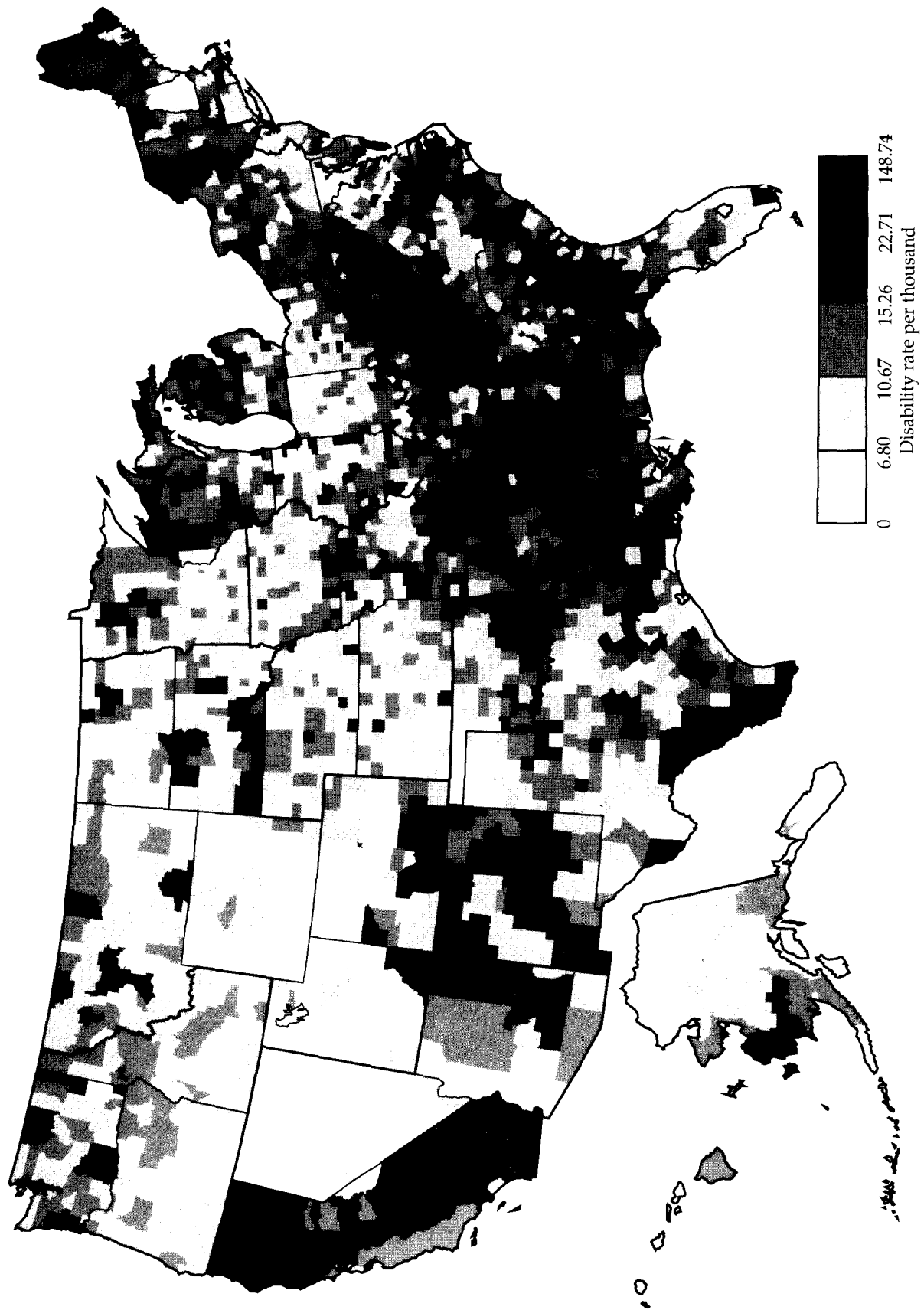


Chart 6.—Supplemental Security Income recipients per thousand women aged 18–64 by county, December 1990

