

**Part V**

# **Two Examples of Specific Services**

## Chapter 15

# Maternal and Infant Health Services in Rural Areas

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# Maternal and Infant Health Services in Rural Areas

## INTRODUCTION

Nearly a million babies are born each year<sup>1</sup> in rural America. Maternity care for women and newborn care for infants are basic components of the health care system and, like emergency services, are considered essential to a community's public health (207). Yet there is evidence that many rural communities have lost or are losing the capacity to provide these basic services to their residents (525). Providing maternal and infant services in rural areas can be difficult, particularly in areas of very sparse populations, because specialized providers and technologies may be required. Further, transportation systems must be available when obstetric emergencies occur that require the advanced systems of care usually found in urban areas.

This chapter reviews the status of rural maternal and infant health, evidence of problems in access to and availability of obstetric services and providers, and Federal interventions that affect access to maternal and infant care. Lastly, the chapter describes selected maternal and infant care programs that have been effective in improving access to care in rural areas.

## MATERNAL AND INFANT HEALTH INDICATORS: URBAN AND RURAL DIFFERENCES

### *Infant and Fetal Mortality*

**In 1987**, infant mortality<sup>2</sup> was 2 percent higher in rural than in urban areas (10.07 v. 9.88 deaths per 1,000 births) (table 15-1).<sup>3</sup> In 1985-86, Wyoming, Idaho, and Maryland were among the States with high white infant mortality in rural areas (11.3, 10.8, and 10.8 per 1,000 births), and Georgia and South

Carolina **were among the States** with high black infant mortality in rural areas (19.9 and 19.6 per 1,000 births) (table 15-2). Causes of infant death vary somewhat by urban and rural residence. In 1987, infant death rates<sup>4</sup> attributable to conditions originating in the perinatal period, such as respiratory distress syndrome, were somewhat lower, but deaths caused by congenital anomalies, sudden infant death syndrome (SIDS), accidents, and pneumonia were somewhat higher in rural than in urban areas (table 15-1).

In 1987, infant mortality rates were 2 percent higher for whites but 8 percent lower for blacks in rural than in urban areas (table 15-3). Neonatal deaths—those occurring in early infancy, before the 28th day of life—occur at about the same rate for urban and rural whites, but the rate for blacks is 10 percent lower in rural than in urban areas. Postneonatal deaths—those occurring in later infancy, from 28 days to age one—are 10 percent higher for whites but 3 percent lower for blacks in rural than in urban areas (table 15-3).<sup>5</sup> The lower neonatal death rate in rural areas is offset by higher fetal mortality. Fetal mortality ratios<sup>6</sup> were 6 percent higher among whites and 14 percent higher among blacks in rural than in urban areas (table 15-3).<sup>7</sup>

The apparently higher incidence of fetal deaths in rural areas could be one cause of relatively low rural neonatal death rates. It may be that babies who would die at or before birth (and would be reported as fetal deaths) in rural areas would be successfully resuscitated and live for short periods of time in urban areas. When fetal and neonatal deaths are combined (perinatal deaths), rural perinatal mortality ratios are 2 and 3 percent higher than urban ratios for blacks and whites, respectively. Interpreting the differences in urban and rural fetal mortality is

<sup>1</sup>In 1987, 22 percent of babies (839,335 of 3,809,394) were born to rural (nonmetropolitan) residents (650)

<sup>2</sup>Infant mortality, as measured by the infant mortality rate, is the annual number of deaths of infants less than 1 year of age, divided by the annual number of live births (15).

<sup>3</sup>Infant mortality rates were standardized for race (white, black, other race) using methods described by Das Gupta (159).

<sup>4</sup>Cause-specific infant death rates were adjusted to account for differences in the distribution of racial groups in urban and rural areas (159).

<sup>5</sup>Neonatal mortality accounts for 65 percent of all infant deaths. The leading causes of neonatal mortality are low birthweight, prematurity, and congenital anomalies, while the leading causes of postneonatal mortality are SIDS, congenital anomalies, and accidents (417).

<sup>6</sup>The fetal mortality ratio is defined as the annual number of fetal deaths (of 20 weeks or more gestation) divided by the annual number of live births (15,647).

<sup>7</sup>Fetal, neonatal, and postneonatal mortality ratios/rates are shown for urban and rural areas by State in table 15-2.

Table 15-1—Selected Cause-Specific Infant Death Rates for Metro and Nonmetro Areas Adjusted for Race, 1987<sup>a</sup>

Causes of death	Metro			Nonmetro		
	Number of deaths	Percent of all deaths	Death rate (per 1,000)	Number of deaths	Percent of all deaths	Death rate (per 1,000)
All causes	30,157	100.0	9.88	6,421	100.0	9.88
Conditions originating in the perinatal period <sup>b</sup>	14,514	48.1	4.71	3,556	43.1	4.39
Short gestation and low birthweight <sup>c</sup>	2,799	9.3	0.89	555	6.7	0.70
Respiratory distress syndrome <sup>d</sup>	2,597	8.6	0.86	686	8.3	0.84
Other respiratory conditions <sup>e</sup>	2,813	9.3	0.92	743	9.0	0.91
Congenital anomalies <sup>f</sup>	6,053	20.1	2.03	1,831	22.2	2.19
Sudden infant death syndrome <sup>g</sup>	4,010	13.3	1.32	1,201	14.8	1.48
Accidents and adverse effects <sup>h</sup>	654	2.2	0.21	96	3.6	0.3
Pneumonia <sup>i</sup>	519	1.7	0.17	47	1.8	0.16

<sup>a</sup>Rates were standardized using the method described by Das Gupta in "A General Method of Decomposing a Difference between Two Rates into Several Components," *Demography*, vol. 15, No. 1, February 1978, pp. 99-112.

<sup>b</sup>These conditions originating in the perinatal period include International Classification of Diseases (ICD) (Ninth Revision) 760-779.

<sup>c</sup>These conditions originating in the perinatal period include ICD 765.

<sup>d</sup>This condition originating in the perinatal period includes ICD 769.

<sup>e</sup>These conditions originating in the perinatal period include ICD 770.

<sup>f</sup>Congenital anomalies include ICD 740-759.

<sup>g</sup>Sudden infant death syndrome includes ICD 798.0.

<sup>h</sup>Accidents and adverse effects include E800-E949.

<sup>i</sup>Pneumonia includes ICD 480-486.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States*, 1987, vol. II, Mortality, Part B 1989, DHHS Pub. No. (PHS) 89-1102, table 2-15 (Washington, DC: U.S. Government Printing Office, 1989).

Table 15-2—Fetal and Infant Health Indicators by State and Metropolitan/Nonmetropolitan Area, 1985-86

State by region	Infant mortality rate <sup>a</sup>		Neonatal mortality rate <sup>b</sup>		Post-neonatal mortality rate <sup>c</sup>		retal mortality ratio <sup>d</sup>		retal mortality ratio <sup>e</sup>		low birth weight rate <sup>f</sup>	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
<b>New England</b>												
Maine.....	10.1	7.5	6.0	5.0	3.2	2.5	6.3	5.8	13.2	10.8	5.3	4.9
White.....	10.2	7.6	7.0	6.1	3.2	2.6	6.3	5.9	13.3	10.9	5.2	4.9
Black.....	-	-	-	-	-	-	-	-	-	-	-	-
New Hampshire.....	8.5	10.3	5.7	6.8	2.8	3.6	5.3	6.0	11.0	12.7	4.9	5.4
White.....	8.6	10.2	5.8	6.7	2.9	3.5	5.4	6.0	11.2	12.7	4.8	5.4
Black.....	-	-	-	-	-	-	-	-	-	-	-	-
Vermont.....	9.0	9.0	-	6.0	-	3.0	-	6.4	13.6	12.4	5.3	5.6
White.....	10.0	8.8	-	5.9	-	2.9	-	6.4	13.8	12.3	5.2	5.6
Black.....	-	-	-	-	-	-	-	-	-	-	-	-
Massachusetts.....	8.8	8.8	6.2	5.7	2.6	3.1	6.6	6.5	12.8	12.1	5.8	4.6
White.....	7.9	8.1	5.7	6.8	2.3	-	6.2	6.5	11.9	12.3	5.4	4.5
Black.....	19.8	-	14.0	-	5.8	-	11.7	-	25.7	-	10.6	-
Rhode Island.....	8.8	-	6.3	-	2.5	-	8.0	-	14.3	-	6.5	4.5
White.....	8.4	-	6.0	-	2.4	-	7.6	-	13.6	-	6.1	4.3
Black.....	-	-	-	-	-	-	-	-	-	-	11.6	-
Connecticut.....	9.7	7.3	7.5	5.1	2.2	-	6.9	4.7	14.4	9.8	6.7	5.6
White.....	8.2	7.4	6.3	5.3	1.9	-	6.2	4.7	12.5	9.9	5.6	5.7
Black.....	13.8	-	15.4	-	4.4	-	11.6	-	26.9	-	13.3	-
<b>Middle Atlantic</b>												
New York.....	10.9	9.3	7.5	6.4	3.4	3.0	9.9	8.0	17.4	14.4	7.3	5.6
White.....	9.3	9.2	6.6	6.3	2.7	2.9	8.8	8.0	15.4	14.3	5.7	5.5
Black.....	16.4	-	10.7	-	5.7	-	8.9	-	24.6	-	12.3	9.1
New Jersey.....	10.4	7.9	7.0	5.8	3.4	2.1	13.1	6.0	15.1	11.8	7.0	5.5
White.....	8.4	7.7	5.9	5.6	2.5	2.0	9.0	6.9	12.9	11.5	5.5	5.2
Black.....	18.7	-	11.8	-	6.9	-	17.3	-	24.0	-	12.4	11.5
Pennsylvania.....	10.8	9.8	7.4	6.3	3.4	3.5	2.9	8.9	16.3	15.2	6.9	5.7
White.....	8.9	9.7	6.2	6.3	2.7	3.4	8.0	8.8	14.2	15.1	5.5	5.7
Black.....	20.1	-	13.5	-	6.6	-	18.2	-	26.7	-	13.6	11.7

<sup>a</sup> Rates are not shown for areas with fewer than 30 events. <sup>b</sup> are used to denote fewer than 30 events.

(continued on next page)

Table 15-2—Fetal and Infant Health Indicators by State and Metropolitan/Nonmetropolitan Area, 1985-86—Continued

State by region	Infant		Neonatal		Post-neonatal		Fetal		Perinatal		LOW-birth- weight rate <sup>f</sup>	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
Nebraska.....	10.2	9.5	7.0	5.9	3.3	3.6	1.4	1.4	14.4	12.7	5.5	1.0
White.....	8.9	9.3	6.3	5.8	2.7	3.4	6.7	7.3	12.9	13.2	5.1	1.0
Black.....	19.4	-	11.4	-	-	-	12.5	-	23.9	-	11.6	-
Kansas.....	9.6	8.6	6.0	5.1	3.6	3.6	6.4	6.7	12.6	11.7	6.5	5.0
White.....	9.0	8.5	5.1	5.0	3.3	3.5	5.9	6.4	11.0	11.3	5.5	5.0
Black.....	15.2	-	9.4	-	-	-	10.9	-	20.4	-	12.9	9.1
<b>South Atlantic</b>												
Delaware.....	14.4	10.9	10.6	8.2	3.8	2.7	6.6	8.5	17.2	16.8	7.5	7.2
White.....	11.0	10.1	8.1	7.9	-	-	5.6	6.4	13.7	14.3	5.8	6.0
Black.....	26.8	-	19.5	-	-	-	-	-	29.4	23.5	13.5	10.9
Maryland.....	11.8	12.1	8.3	7.7	3.5	4.4	8.3	7.1	16.6	14.8	7.8	6.6
White.....	9.1	10.8	6.2	6.8	2.9	3.9	6.4	6.7	12.6	13.6	5.5	5.3
Black.....	18.2	16.5	13.3	10.5	4.9	-	12.7	-	26.0	18.8	12.6	11.7
District of Columbia.....	20.9	-	16.0	-	4.9	-	12.4	-	28.4	-	12.7	-
White.....	12.0	-	9.1	-	-	-	-	-	14.4	-	5.1	-
Black.....	23.9	-	11.3	-	5.6	-	14.5	-	32.8	-	14.7	-
Virginia.....	11.5	10.5	8.1	6.7	3.4	3.4	10.2	12.1	18.3	18.8	7.0	7.1
White.....	9.2	8.8	5.5	5.6	2.8	3.0	8.4	10.7	14.9	16.0	5.4	6.0
Black.....	18.8	17.6	11.4	11.7	5.4	5.1	16.1	18.2	29.5	29.0	11.3	11.7
West Virginia.....	9.7	10.9	6.6	7.2	3.1	3.7	7.6	8.3	14.2	15.5	6.2	7.4
White.....	9.3	10.4	6.3	6.8	3.0	3.6	7.3	8.4	13.6	11.2	5.4	7.1
Black.....	-	-	-	-	-	-	-	-	-	-	9.8	12.9
North Carolina.....	11.5	11.8	7.9	7.4	3.6	4.4	8.1	9.2	16.1	16.7	7.7	8.2
White.....	9.7	8.8	6.7	5.5	3.0	3.3	6.7	7.8	13.4	13.2	5.9	6.2
Black.....	17.2	18.8	11.8	11.8	5.4	6.3	12.3	12.5	24.1	24.3	12.5	12.3
South Carolina.....	13.1	14.6	9.2	9.7	3.9	5.0	10.0	11.1	19.3	20.8	8.2	9.2
White.....	9.7	10.2	6.7	6.9	3.1	3.8	7.6	7.9	14.3	14.8	6.0	6.0
Black.....	20.4	19.6	14.6	12.7	5.6	6.0	15.3	14.6	29.8	27.4	12.6	12.7
Georgia.....	12.0	11.4	8.4	9.0	3.7	4.1	11.1	12.8	19.4	21.8	7.9	8.4
White.....	9.1	10.1	6.8	6.0	2.8	3.5	8.5	11.0	14.8	11.9	5.8	6.5
Black.....	17.9	1.9	12.1	13.0	5.6	6.2	16.0	16.3	28.3	28.3	11.9	12.0
Florida.....	11.0	11.8	7.4	7.0	3.7	4.9	8.5	9.0	15.9	16.0	7.6	7.2
White.....	8.8	10.4	6.0	5.9	2.8	4.8	6.9	7.1	12.9	13.0	6.0	5.8
Black.....	18.1	17.2	11.8	11.1	6.3	6.5	13.5	16.2	25.3	27.3	12.6	12.4

NOTE: Rates are not shown for areas with fewer than 30 events. Hyphens (-) are used to denote fewer than 30 events.

Table 15-2—Fetal and Infant Health Indicators by State and Metropolitan/Nonmetropolitan Area, 1985-86—Continued

State by region	Infant		Neonatal		Post-neonatal		Fetal		Perinatal		Low-birth- weight rate <sup>f</sup>	
	mortality rate <sup>a</sup>	Metro Nonmetro	mortality rate <sup>b</sup>	Metro Nonmetro	mortality rate <sup>c</sup>	Metro Nonmetro	mortality ratio <sup>d</sup>	Metro Nonmetro	mortality ratio <sup>e</sup>	Metro Nonmetro	Metro	Nonmetro
<b>East North Central</b>												
Ohio.....	10.6	9.9	6.9	6.2	3.7	3.6	7.4	7.2	14.4	13.5	6.8	5.8
White.....	9.3	9.7	6.1	6.1	3.2	3.6	6.7	7.1	12.8	13.3	5.7	5.7
Black.....	17.2	-	11.0	-	6.2	-	11.1	-	22.1	21.0	12.1	8.3
Indiana.....	11.4	10.2	7.2	7.2	3.8	3.0	7.5	7.3	15.1	14.1	6.6	5.8
White.....	10.0	10.1	6.6	7.0	3.5	3.0	6.6	7.4	13.2	14.1	5.8	5.7
Black.....	20.6	-	14.6	-	6.4	-	12.4	-	28.6	-	11.8	10.5
Illinois.....	12.3	9.8	8.2	6.3	3.7	3.5	7.8	7.5	16.2	16.8	7.6	5.7
White.....	9.2	9.5	6.4	6.1	4.0	3.4	6.4	7.2	12.9	10.3	5.4	5.7
Black.....	21.9	17.8	14.5	-	2.8	-	11.9	16.2	28.4	9.4	13.9	10.6
Michigan.....	11.8	-	8.3	5.7	7.6	3.4	5.8	5.5	4.8	14.2	7.1	5.1
White.....	9.2	9.1	6.1	5.6	3.6	3.4	5.2	5.5	11.1	11.2	5.5	5.3
Black.....	22.7	-	16.2	-	3.6	-	8.1	-	14.0	-	13.8	8.3
Wisconsin.....	9.2	9.1	5.2	5.8	6.0	3.3	6.6	5.9	22.5	11.7	5.6	4.6
White.....	8.2	9.0	4.4	5.7	3.3	3.3	5.6	5.9	10.5	11.7	4.7	4.7
Black.....	17.3	-	1.1	-	3.6	-	13.9	-	15.2	-	12.4	6
<b>West North Central</b>												
Minnesota.....	8.9	9.2	5.9	5.3	6.3	3.9	6.1	6.8	2.5	12.1	5.2	4.3
White.....	8.6	9.3	5.4	5.5	3.1	3.8	6.1	6.8	11.3	12.3	4.8	4.2
Black.....	16.8	-	8.9	-	7.4	-	17.5	-	17.5	-	11.6	-
Iowa.....	9.8	8.4	6.3	5.3	3.5	3.1	5.3	6.5	11.7	11.8	5.5	4.9
White.....	9.7	8.3	6.3	5.2	3.4	3.1	5.2	6.4	11.5	11.6	5.2	4.9
Black.....	-	-	-	-	-	-	-	-	-	-	11.6	-
Missouri.....	10.9	9.4	7.1	5.7	3.9	3.7	6.2	7.3	13.3	13.0	7.1	6.1
White.....	9.1	9.3	6.0	5.6	3.0	3.7	5.2	7.1	11.2	12.7	5.5	5.8
Black.....	18.3	-	11.1	-	7.1	-	10.1	-	21.2	21.1	12.8	11.8
North Dakota.....	11.1	8.1	5.1	4.4	3.1	3.7	7.0	5.6	12.3	1.1	5.1	4.8
White.....	9.4	7.7	5.1	4.2	3.8	3.5	7.3	5.0	12.8	0.1	5.1	4.5
Black.....	9	-	-	-	-	-	-	-	9	-	-	-
South Dakota.....	12.0	11.5	7.2	6.0	4.7	5.5	5.7	6.4	13.0	12.0	5.4	5.4
White.....	12.3	9.0	-	5.3	-	3.6	-	6.1	13.6	11.4	5.4	5.0
Black.....	-	-	-	-	-	-	-	-	-	-	11.4	-

NOTE: Rates are not shown for areas with fewer than 30 events. Hyphens (-) are used to denote fewer than 30 events.

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Table 15-2—Fetal and Infant Health Indicators by State and Metropolitan/Nonmetropolitan Area, 1985-86—Continued

State by region	Infant		Neonatal		Post-neonatal		Fetal		Perinatal		Low-birth- weight rate <sup>f</sup>	
	mortality rate <sup>a</sup>		mortality rate <sup>b</sup>		mortality rate <sup>c</sup>		mortality ratio <sup>d</sup>		mortality ratio <sup>e</sup>		Metro	Nonmetro
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
<b>East South Central</b>												
Kentucky.....	10.4	10.7	6.7	7.1	3.7	3.6	8.0	8.4	14.7	15.6	7.0	14.0
White.....	9.2	10.5	5.8	7.1	3.4	3.4	7.2	8.0	13.0	15.1	6.1	11.8
Black.....	17.6	14.0	12.0	-	5.6	-	13.1	16.4	25.1	24.7	13.1	6.8
Tennessee.....	12.1	9.4	8.1	5.4	4.0	3.9	8.8	8.2	14.9	13.6	8.2	10.6
White.....	8.9	8.6	5.8	4.9	3.0	3.7	5.8	7.2	11.7	12.2	6.0	7.9
Black.....	20.1	15.8	13.7	9.6	6.3	6.2	9.2	15.2	22.9	24.7	12.0	6.7
Alabama.....	13.0	12.7	9.1	7.9	3.8	4.8	10.2	12.3	19.3	20.2	8.1	12.9
White.....	10.2	9.8	7.0	6.7	3.2	3.1	7.6	9.8	14.7	16.5	5.8	7.0
Black.....	18.6	18.4	13.3	10.3	5.3	8.1	15.4	17.0	28.7	27.3	12.1	6.3
Mississippi.....	11.5	13.7	7.5	8.3	4.1	5.1	19.4	12.1	17.9	20.5	8.1	11.1
White.....	9.5	9.0	6.3	5.5	3.2	5.3	19.1	7.8	13.4	13.4	6.0	9.0
Black.....	15.3	18.3	9.8	11.1	5.5	3.4	15.9	16.2	25.7	27.4	11.9	16.0
<b>West South Central</b>												
Arkansas.....	11.2	10.8	6.8	6.0	4.4	4.7	7.8	8.2	14.7	14.3	8.2	7.5
White.....	9.9	10.0	6.1	5.9	3.8	4.0	6.8	6.9	12.9	12.8	6.7	6.2
Black.....	15.7	13.9	9.3	6.7	6.4	7.3	10.6	12.7	14.9	19.4	12.5	12.0
Louisiana.....	12.6	10.0	8.4	6.6	4.2	4.0	8.6	9.2	15.0	15.7	8.9	8.3
White.....	9.1	7.0	6.4	5.1	2.7	2.8	6.3	6.9	17.7	12.0	5.9	5.8
Black.....	18.0	15.9	11.5	9.3	6.5	6.2	12.3	13.4	22.7	22.7	13.2	12.6
Oklahoma.....	10.8	10.5	6.8	6.0	4.0	4.2	7.4	8.2	3.2	14.2	5.5	6.3
White.....	10.3	10.3	6.5	6.3	3.8	4.4	7.0	8.1	14.6	14.4	11.8	6.1
Black.....	18.5	15.7	11.3	-	7.2	-	10.7	-	13.0	21.0	11.9	11.9
Texas.....	9.6	7.0	6.1	5.9	3.9	3.9	7.0	7.8	12.1	13.8	6.1	5.8
White.....	8.7	9.9	5.6	5.7	3.5	3.6	6.5	7.3	13.1	13.0	5.8	5.8
Black.....	15.7	19.3	9.9	8.5	5.8	7.1	10.0	12.1	12.9	20.6	12.2	11.2
<b>Mountain</b>												
Montana.....	10.5	9.0	4.4	5.5	5.9	4.2	6.7	7.4	11.3	12.9	6.0	5.7
White.....	10.5	8.8	-	5.2	5.9	3.6	7.1	-	11.7	11.7	6.0	5.7
Black.....	-	-	-	-	-	-	-	-	-	-	-	-
Idaho.....	11.5	10.7	6.2	6.0	5.3	4.1	7.5	6.9	13.8	13.5	4.9	5.5
White.....	11.5	10.8	6.3	6.6	5.2	4.2	7.7	6.7	14.0	13.3	4.9	5.4
Black.....	-	-	-	-	-	-	-	-	-	-	-	-
Wyoming.....	12.4	11.4	-	5.8	-	5.6	-	6.3	17.5	12.1	6.6	7.0
White.....	12.7	11.3	-	6.0	-	5.3	-	6.3	17.1	12.3	6.6	7.0
Black.....	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: Rates are not shown for areas with fewer than 30 events. Hyphens (-) are used to denote fewer than 30 events.

Table 15-2—Fetal and Infant Health Indicators by State and Metropolitan/Nonmetropolitan Area, 1985-86—Continued

State by region	Infant		Neonatal		Post-neonatal		Fetal		Perinatal		Low-birth- weight rate <sup>f</sup>	
	mortality rate <sup>a</sup>		mortality rate <sup>b</sup>		mortality rate <sup>c</sup>		mortality rate <sup>d</sup>		mortality rate <sup>e</sup>		Metro	Nonmetro
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
Colorado.....	9.4	8.4	5.5	5.1	3.7	3.1	8.1	9.4	13.6	14.5	7.8	7.4
White.....	8.6	8.4	5.2	5.2	3.6	3.2	8.0	9.4	13.1	14.6	7.3	7.4
Black.....	16.7	-	9.9	-	6.8	-	10.9	-	20.8	-	13.8	-
New Mexico.....	10.4	9.9	6.5	5.4	3.9	4.5	4.5	5.6	10.9	11.0	7.1	6.9
White.....	9.7	9.9	5.9	5.9	3.9	4.0	4.3	5.8	10.2	11.7	7.1	7.2
Black.....	-	-	-	-	-	-	-	-	-	-	9.8	9.3
Arizona.....	9.5	9.8	6.0	4.8	3.5	4.9	6.2	7.4	12.2	12.3	6.2	6.3
White.....	9.2	9.2	5.8	4.9	3.4	4.3	5.9	7.6	11.7	12.5	5.9	6.4
Black.....	14.0	-	10.0	-	-	-	9.8	-	19.8	-	12.1	9.8
Utah.....	9.0	9.3	5.1	5.6	3.9	3.7	6.6	6.8	11.7	12.4	5.6	5.3
White.....	9.1	9.5	5.2	5.8	3.9	3.7	6.5	6.8	11.7	12.5	5.5	5.3
Black.....	-	-	-	-	-	-	-	-	-	-	10.3	-
Nevada.....	8.9	8.4	5.1	3.5	3.8	4.8	6.6	9.9	11.7	13.4	7.3	6.5
White.....	8.7	8.4	5.0	3.8	3.7	4.6	6.3	9.2	11.2	13.0	6.3	6.2
Black.....	14.0	-	-	-	-	-	10.2	-	18.5	-	13.2	-
Pacific												
Washington.....	10.2	10.4	5.9	5.5	4.3	4.8	6.1	6.0	11.9	11.6	5.3	4.7
White.....	10.3	10.3	5.9	5.4	4.4	4.9	5.8	6.3	11.7	11.7	4.9	4.6
Black.....	13.2	-	8.3	-	4.9	-	9.1	-	17.4	-	10.7	-
Oregon.....	9.4	10.0	5.0	5.1	4.5	5.0	6.0	7.4	11.0	12.4	5.1	5.2
White.....	9.3	9.9	4.8	5.0	4.5	4.9	6.1	7.4	10.9	12.4	4.9	5.2
Black.....	17.0	-	-	-	-	-	-	-	18.1	-	11.1	-
California	9.2	9.8	5.8	5.4	3.4	4.4	6.7	7.2	12.5	12.6	6.0	5.4
White.....	9.0	9.9	5.6	5.5	3.2	4.3	6.3	7.2	11.9	12.7	5.2	5.2
Black.....	16.4	-	10.1	-	6.2	-	11.4	-	21.5	-	12.0	8.7
Alaska.	9.1	12.0	4.9	6.2	4.2	5.8	6.0	7.8	10.9	14.0	4.8	4.6
White.....	9.0	10.6	4.7	6.2	4.3	4.4	5.4	7.4	10.1	13.6	4.3	4.1
Black.....	-	-	-	-	-	-	-	-	-	-	9.0	9.8
Hawaii.....	9.7	7.0	6.5	4.6	3.2	2.4	9.4	9.5	15.9	14.1	6.6	6.8
White.....	8.1	-	5.4	-	-	-	8.0	-	13.4	18.6	5.3	5.6
Black.....	-	-	-	-	-	-	-	-	22.0	-	9.0	-

NOTE: Rates are not shown for areas with fewer than 30 events. Hyphens (-) are used to denote fewer than 30 events.

(continued on next page)

Table 15-2—Fetal and Infant Health Indicators by State and Metropolitan/Nonmetropolitan Area, 1985-88-Continued

- <sup>a</sup>The infant mortality rate is the number of infant deaths (under 1 year of age) in 1985 and 1986 divided by the number of live births during 1985 and 1986. Infant mortality is shown as deaths per 1,000 live births.
- <sup>b</sup>The neonatal mortality rate is the number of neonatal deaths (under 28 days) in 1985 and 1986 divided by the number of live births during 1985 and 1986. Neonatal mortality is shown as deaths per 1,000 live births.
- <sup>c</sup>The postneonatal mortality rate is the number of postneonatal deaths (from 28 days to 1 year of age) in 1985 and 1986 divided by the number of live births during 1985 and 1986. Postneonatal mortality is shown as deaths per 1,000 live births.
- <sup>d</sup>The fetal mortality ratio is the number of fetal deaths in 1985 and 1986 divided by the number of live births during 1985 and 1986. Fetal deaths include only those with stated or presumed period of gestation of 20 weeks or more. Fetal mortality is shown as deaths per 1,000 live births.
- <sup>e</sup>The perinatal mortality ratio is the number of fetal deaths and neonatal deaths (under 28 days) in 1985 and 1986 divided by the number of live births during 1985 and 1986. Fetal deaths include only those with stated or presumed period of gestation of 20 weeks or more. Perinatal mortality is shown as deaths per 1,000 live births.
- <sup>f</sup>The low-birthweight rate is the number of live births weighing less than 2,500 grams in 1985 and 1986 divided by the number of live births during 1985 and 1986. Low-birthweight is shown as the number of low-birthweight births per 100 live births.

SOURCES: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, Vital Statistics of the United States, 1985, vol. II, Mortality, Part B, DHHS Pub. No. (PHS) 88-1102, table 8-2; Vital Statistics of the United States, 1986, vol. II, Mortality, Part B, DHHS Pub. No. (PHS) 88-1114, table 8-2; Vital Statistics of the United States, 1985, vol. I, Natality, DHHS Pub. No. (PHS) 88-1113, table 2-2; Vital Statistics of the United States, 1986, vol. I, Natality, DHHS Pub. No. (PHS) 89-1113, table 2-2 (Washington, DC: U.S. Government Printing Office, 1987, 1988, 1988, and 1989, respectively).

Table 15-3-Infant Death Rates and Fetal Death Ratios by Race in Metropolitan and Nonmetropolitan Areas<sup>a</sup>, 1987

	Metro			Nonmetro		
	Total	Urban places <sup>b</sup>	Balance of area	Total	Urban places <sup>c</sup>	Balance of area
Infant mortality rate <sup>d</sup> .....	10.2	10.8	8.6	9.8	10.2	9.7
m white infants.....	8.6	8.9	8.0	8.8	9.1	8.7
nonwhite infants.....	15.5	15.7	14.2	15.0	14.8	15.1
black infants.....	18.1	18.1	17.7	16.7	16.3	16.9
Neonatal mortality rate <sup>e</sup> .....	6.6	7.0	5.6	6.1	6.3	6.0
white infants.....	5.5	5.7	5.1	5.4	5.6	5.4
nonwhite infants.....	10.1	10.2	9.6	9.4	9.0	9.5
black infants.....	11.9	11.9	12.3	10.7	10.1	11.0
Postneonatal mortality rate <sup>f</sup> .....	3.6	3.8	3.0	3.7	3.9	3.7
white infants.....	3.1	3.2	2.9	3.4	3.5	3.3
nonwhite infants.....	5.4	5.5	4.6	5.6	5.8	5.6
black infants.....	6.2	6.2	5.4	6.0	6.2	5.9
Fetal mortality ratio <sup>g</sup> .....	7.6	7.9	7.1	7.9	8.2	7.9
white infants.....	6.6	6.7	6.4	7.0	7.3	7.0
nonwhite infants.....	11.3	11.0	12.7	12.5	11.9	12.8
black infants.....	12.7	12.4	14.8	14.5	13.7	14.9

<sup>a</sup>Deaths are recorded by maternal residence, not place of death.

<sup>b</sup>Urban places in metro counties are those with populations of 10,000 or more in 1980.

<sup>c</sup>Urban places in nonmetro counties are those with populations of 10,000 or more but fewer than 50,000 in 1980.

<sup>d</sup>Infant mortality rate: The annual number of deaths among children less than 1 year old as a proportion of the annual number of live births.

<sup>e</sup>Neonatal mortality rate: The annual number of deaths during the first 27 days of life as a proportion of the annual number of live births.

<sup>f</sup>Postneonatal mortality rate: The annual number of deaths that occur from 28 days to age 1 as a proportion of the annual number of live births.

<sup>g</sup>Fetal mortality ratio: The annual number of fetal deaths occurring at gestations of 20 weeks or more as a proportion of the annual number of live births.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States, 1987, vol. II, Mortality, Part B*, DHHS Pub. No. (PHS) 89-1102, table 8-2 (Washington, DC: U.S. Government Printing Office, 1989).

difficult because of regional variation in reporting fetal mortality (647).

The higher postneonatal mortality rates in rural areas could be explained if deaths of high-risk infants were postponed beyond the neonatal period. This could occur if, for example, high-risk rural infants are less likely to survive after being discharged from remote tertiary centers because they have limited access to continued specialty care and social service support (277). Another explanation for the relatively high rural postneonatal mortality is the higher incidence in rural than urban areas of infant deaths attributable to congenital anomalies, SIDS, and accidents—all significant causes of postneonatal mortality. In an Alabama study, infection was identified as a contributor to the high rural postneonatal mortality (176).

There is limited information about the maternal risk factors that increase the chances of having a fetal

or infant death. An equal proportion (30 percent) of pregnant women in urban and rural areas have at least one medical condition that seriously affects pregnancy(8). Some information regarding smoking-associated risks is available from the 1985 Health Interview Survey, which found that rural women were just as likely as urban women to report smoking cigarettes in the 12 months preceding the birth of their last child (32 percent). However, women smokers in rural areas were more likely to cut down smoking and less likely to quit (38 percent cut down; 19 percent quit) than were urban women (35 percent cut down; 22 percent quit) (649).

### Low Birthweight and Prematurity

Babies that are born too small or too soon are more likely to die; if they survive they are more likely to require hospitalization and very expensive, sophisticated care(417). There are only slight differences in low birthweight rates<sup>8</sup> between urban and rural

<sup>8</sup>Low-birthweight babies are those born weighing less than 5½ pounds (2,500 grams).

**Table 15-4-Percent of Births That Are Low Birthweight<sup>a</sup> and Preterm<sup>b</sup> by Metropolitan and Nonmetropolitan Areas, 1986**

	<u>Low birthweight</u>		<u>Preterm</u>		<u>Low birthweight and preterm</u>	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
All races <sup>c</sup> . . . . .	6.89	6.49	6.33	6.21	3.12	2.88
white . . . . .	5.60	5.75	5.08	5.20	2.51	2.52
Black . . . . .	12.66	11.72	11.88	12.79	5.97	5.52

<sup>a</sup>Births weighing less than 2,500 grams are low birthweight.

<sup>b</sup>Births occurring at 20 to 36 weeks are preterm.

<sup>c</sup>Includes races other than white and black.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, **National Center for Health Statistics, Vital Statistics of the United States, 1986, I, Natality**, DHHS Pub. No. (PHS) 88-1123, table 1-88 (Washington, D.C.: U.S. Government Printing Office, 1988).

white infants, but among blacks, low birthweight rates are 8 percent lower in rural than urban areas (table 15-4). Colorado and New Mexico are among the States with the highest proportion of white low-birthweight newborns in rural areas (7.4 and 7.2 percent) and West Virginia, Tennessee, and South Carolina are among the States with the highest proportion of black low-birthweight newborns in rural areas (12.9, 12.7, and 12.7 percent) (table 15-2).

The apparently higher incidence of fetal deaths among blacks could be depressing the incidence of low-birthweight newborns for the same reason that it may be an explanation for low rural neonatal death rates—rural low-birthweight fetuses may not be surviving until birth or may be dying at birth and reported as fetal deaths. There are relatively fewer very-low-birthweight black babies reported in rural than in urban areas, which could be reexplained by either differential mortality or reporting (646). Preterm births<sup>9</sup> occur somewhat more frequently in rural than urban areas for both whites and blacks (table 15-4).<sup>10</sup>

### Fertility

Fertility rates<sup>11</sup> are higher in rural than in urban areas, although this pattern is not consistent across

all racial and ethnic groups (table 15-5) (630). Women in rural areas are more likely to have at least one child, especially at younger ages. In 1988, for example, over one-third (34 percent) of women age 18 to 24 in rural areas reported having children compared with less than one-quarter (24 percent) in urban areas (630). Correspondingly, a greater proportion of births occur to teenage mothers in rural than urban areas (15 percent v. 12 percent) (650). Despite these differences, the number of births expected in a woman's lifetime is similar for rural and urban women (630).

Women in rural areas are much less likely than urban women to have had elective abortions. In 1987, only 14 percent of abortion patients were rural residents, yet rural residents made up 23 percent of the population (217).

### Maternal Mortality

Maternal mortality among rural women is worse than for urban women in general, but mortality rates for both have declined over time. In 1980, 334 women died from conditions related to complications of pregnancy and childbirth.<sup>12</sup> In that year maternal mortality rates<sup>13</sup> were 23 percent higher in rural than urban areas (10.1 v. 8.2 maternal deaths

<sup>9</sup>Premature babies are those born at 20 to 36 weeks gestation (646).

<sup>10</sup>The incidence of both low birthweight and prematurity is nearly the same in urban and rural areas for whites, but for blacks it is slightly higher in urban than rural areas (table 15-4).

<sup>11</sup>The fertility rate is defined here as the number of live births to women age 18 to 44 in 1988, divided by the estimated mid-year population of women 18 to 44 years of age (630).

<sup>12</sup>Maternal mortality includes deaths due to complications of pregnancy, childbirth, and the puerperium (the period of 42 days following the termination of pregnancy). Causes of maternal mortality include uterine hemorrhage, toxemia, and underlying medical conditions that complicate pregnancy such as diabetes and infections (e.g., tuberculosis, syphilis) (647).

<sup>13</sup>The maternal mortality rate is the annual number of deaths related to pregnancy divided by the annual number of live births.

**Table 15-5—Fertility Rates<sup>a</sup> by Metropolitan and Nonmetropolitan Residence, 1988**

	Total	Metro		Nonmetro
		Total	Central city	
All races. . . . .	69.7	68.5	73.1	74.6
white . . . . .	66.0	64.4	67.4	71.9
Black . . . . .	<b>87.0</b>	<b>86.6</b>	<b>89.6</b>	<b>88.8</b>
Hispanic. . . . .	94.0	96.6	96.3	58.2

<sup>a</sup>**Fertility rates** = annual live births per 1,000 women age 18 to 44.  
 bp, s of Hispanic origin may be of **any** race.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "Fertility of American Women: June 1988," Current Population Reports, Series P-20, No. 436, table 4 (Washington, DC: U.S. Government Printing Office, 1989).

per 100,000 live births).<sup>14</sup> As of 1986, the total number of maternal deaths had declined to 272. In 1986, maternal mortality rates were still slightly higher in rural than in urban areas, but the highest rates occurred in the most densely populated urban areas (table 15-6).

## MATERNAL AND INFANT SERVICES IN RURAL AREAS

### *Use of Prenatal Care*

Prenatal care prevents many poor pregnancy outcomes, especially among women who are at high risk of adverse outcomes, and augmented prenatal care programs targeted to high-risk women appear to improve the onset and frequency of prenatal visits (561,619). The three basic components of prenatal care are (697):

- early and continuing risk assessment, health promotion, and
- medical and psychosocial interventions and followup (which may include referral to, or consultation with, other specialized providers).

Prenatal care ideally involves frequent provider-patient contacts that begin before or early in pregnancy (697). Rural women are slightly less likely than urban women to begin prenatal care during the first trimester of pregnancy, but more urban women have no prenatal care at all (table 15-7).

**Table 15-6-Maternal Mortality<sup>a</sup> by Metropolitan and Nonmetropolitan Residence and Race, 1986**

	Number of deaths	Death rate per 100,000
Us. . . . .	272	7.24
Metro. . . . .	210	7.22
Urban places <sup>b</sup> . . . . .	170	8.40
Balance of area. . . . .	40	4.51
Nonmetro. . . . .	62	7.30
Urban places <sup>c</sup> . . . . .	13	6.98
Balance of area. . . . .	49	7.40
White. . . . .	146	4.91
Black. . . . .	117	18.83
All other. . . . .	126	19.40

<sup>a</sup>**Maternal mortality rate** is the annual number of deaths related to pregnancy divided by the annual number of live births.

<sup>b</sup>**Urban places** in metro counties are those with populations of 10,000 or more in 1980.

<sup>c</sup>**Urban places** in nonmetro counties are those with populations of 10,000 or more, but fewer than 50,000 in 1980.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, Vital Statistics of the United States, 1986, vol. II, Mortality, Part B, DHHS Pub No. (PHS) 88-1114, tables 8-9, 8-5 (Washington, DC: U.S. Government Printing Office, 1988).

Women living in rural areas that include a large economically disadvantaged population might be expected to have less access to prenatal care. This expectations borne out for white women; a greater proportion of white pregnant women in poor rural counties<sup>15</sup> received inadequate prenatal care in

<sup>14</sup>These mortality rates were adjusted for maternal age and race (159).

<sup>15</sup>Poor rural counties include the 332 nonmetro counties in 26 States that had at least 25 percent of residents living below the Federal poverty threshold in 1979(558).

<sup>16</sup>Inadequate prenatal care is either care that begins during the third trimester of pregnancy or no prenatal care (558).

**Table 15-7-Live Births by Month Prenatal Care Began, by Race and Residence, 1987**

	Metro	Nonmetro
Total births . . . . .	2,970,059	839,335
1st-2nd month. . . . .	54.67	49.23
3rd month . . . . .	20.16	23.43
4th-6th month. . . . .	16.87	19.70
7th-9th month . . . . .	3.91	4.54
No prenatal care. . . . .	2.08	1.46
Not stated. . . . .	2.30	1.65
<hr/>		
White . . . . .	2,290,927	701,561
1st-2nd month . . . . .	58.58	52.02
3rd month . . . . .	20.00	23.61
4th-6th month. . . . .	14.58	17.71
7th-9th month . . . . .	3.28	3.87
No prenatal care... . . . .	1.58	1.18
Not stated . . . . .	1.99	1.61
<hr/>		
Black . . . . .	538,822	102,745
1st-2nd month . . . . .	38.88	34.41
3rd month. . . . .	20.87	22.51
4th-6th month . . . . .	26.25	30.65
7th-9th month . . . . .	6.34	7.71
No prenatal care. . . . .	4.39	3.03
Not stated . . . . .	3.28	1.68

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, unpublished tabulation from the *Nativity Statistics Branch*, November 1988.

1984<sup>16</sup> than white pregnant women nationally. Black women residing in such areas, however, were more likely to have received adequate prenatal care than black women nationally (table 15-8) (558).<sup>17</sup> In 1985, infant mortality and the incidence of low birthweight were higher for both black and white infants born in poor rural counties than in the Nation as a whole (table 15-8)(558).

### *Access to Rural Maternal and Infant Care*

Available evidence suggests that fetal, infant, and maternal mortality are somewhat higher and that late prenatal care is more a problem in rural than in urban areas. Access to maternity and infant care in rural areas could be impaired by:

- . absolute shortages of obstetric providers,
- . shortages of obstetric providers who participate in the Medicaid program,
- . a lack of insurance coverage and the inability to pay for obstetric services,
- . a decline in the number of hospitals equipped and staffed to provide obstetric services, and
- residents' geographic isolation from services and poor access to regional perinatal care systems.

### *Availability of Rural Obstetric Providers*

**Supply of Providers in Rural Areas--Information** from a number of State surveys indicates that there have been declines in the availability of obstetric providers (box 15-A). This, coupled with the low population density that characterizes many rural areas, results in longer "travel times to obstetric providers for rural than for urban residents (see ch. 10, table 10-16).<sup>18</sup>

Maternity services may be delivered by any of three groups of providers: obstetricians, other physicians (primarily family physicians (FPs)), and other practitioners, such as certified nurse-midwives (CNMs). In 1987, births in urban and rural areas were almost equally likely to be attended by a physician, but nonphysician providers were most likely to deliver babies in the most urban areas<sup>19</sup> (4.2 percent of births) and in the most rural areas<sup>20</sup> (3.5 percent of births). Black women were more likely than white women in both urban and rural areas to have had a nonphysician provider (table 15-9).

Obstetricians provide most obstetric care in urban areas, but in rural areas one-half to two-thirds of all obstetric care providers are FPs (349,543). In 1988, there were only 25 obstetricians per 100,000 women of reproductive age in rural areas, compared with 61 in urban areas (table 15-10). Obstetricians are even less available in smaller nonmetro counties (see ch. 10, table 10-11). The absence of obstetricians in many rural areas is partially offset by the presence of general and family practitioners (G/FPs) (including doctors of osteopathy (DOs)) who are trained to

<sup>17</sup>During the period 1980 to 1984, the States with the highest levels of inadequate prenatal care in poor rural counties were in the Southwest (i.e., New Mexico, Texas, Utah, and Arizona) (558).

<sup>18</sup>Rural residents travel an average of 24 minutes to reach an obstetrician/gynecologist and 20 minutes to reach an FP in contrast with urban residents who, on average, travel 19 and 16 minutes to reach these providers (644).

<sup>19</sup>Urban places within metro Counties.

<sup>20</sup>Nonurban places in nonmetro counties.

Table 15-8--Perinatal Health Care Indicators in Poor Rural Counties<sup>a</sup>

	National		Poor rural counties	
	White	Black	White	Black
Infant mortality (1985). . . . .	9.3	18.2	10.0	19.2
Low birthweight (1985). . . . .	5.6	12.4	6.6	12.6
Inadequate prenatal care (1984) <sup>b</sup> . . . . .	4.7	9.6	4.9	7.3

<sup>a</sup>poor rural counties include the 332 nonmetro counties in 26 States that had at least 25 Percent of residents living below the Federal poverty threshold in 1979.

<sup>b</sup>Percent of births to women who receive either no prenatal care or who began receiving care during their third trimester of pregnancy, 1984.

SOURCE: J. Shotland, D. Loonin, and E. Haas, *Off to a Poor Start: Infant Health in Rural America* (Washington, DC: Public Voice for Food and Health Policy, October 1988).

### Box 15-A—Obstetric Provider Availability: Selected State Reports

**Arizona**—Of available rural obstetric providers (DOs, G/FPs and obstetricians), 58 percent reported that they conducted deliveries in 1989, compared with 74 percent of providers in 1985. Of those discontinuing obstetric practice, 87 percent cited malpractice concerns as the reason. Forty-four percent of physicians that had ceased delivering babies said they would resume if there was a malpractice insurance subsidy available (221).

**Colorado**—As of July 1988, there were 18 rural counties in Colorado with no private practice maternity care providers. Over 1,000 women living in these counties had babies and had to travel an average of 32 miles to deliver (136).

**Iowa**—A 1986 survey found that of 496 physicians who had provided obstetric services since 1981, 152 (31 percent) had discontinued providing them because of liability considerations. Of these 152, 78 described their practices as rural (225).

**Missouri**—A 1988 survey of 328 rural G/FPs showed that 40 percent practiced obstetrics, but that there had been a 27 to 40 percent decrease since 1984 in the number of obstetric providers in rural areas (745).

**Montana**—A 1989-90 survey found that 12 percent of physicians who had provided obstetric services at one time had dropped obstetric care. As many as 35 percent of FPs and 9 percent of obstetricians had dropped obstetrics. Only 29 percent of physicians who ever provided obstetric services reported that they had not limited their services to Medicaid patients, decreased the number of deliveries they perform, decreased the level of high-risk obstetric care, or limited their practices in any way. The cost of professional liability insurance was cited most often as the reason obstetric providers had changed their practices (173).

**North Carolina**—In 1989-90, there were over 4,000 births in 20 mostly rural counties that had no obstetric providers (i.e., physicians, nurse-midwives) (537).

**Texas**—As of 1989, 43 percent of rural physicians had curtailed obstetric services and 84 counties offered no labor or delivery services (97).

**Washington**—The proportion of rural G/FPs providing obstetric care fell from 80 percent in 1977 to 67 percent in 1986. Only 38 percent of urban G/FPs provided obstetric care in 1986 (526).

deliver obstetric care. In 1988, rural areas had more G/FPs (137 per 100,000 women of reproductive age) than did urban areas (108 per 100,000 women of reproductive age) (table 15-10).

The availability of rural physicians trained to deliver obstetric care varies by region. In rural areas of the East South Central region of the country<sup>21</sup>

there were 156 physicians trained to provide obstetric services (i.e., G/FPs, obstetricians, and DOs) per 100,000 rural women of reproductive age. In contrast, there were 242 per 100,000 in the rural areas of States in the West North Central Region (table 15-10). Over half a million rural residents live in counties that are without a physician trained to

<sup>21</sup>See app. F for a list of States in each region.



Table 15-9-Live Births by Type of Birth Attendant, by Race and Place of Delivery, 1987

	Total number of deliveries	Attendant		
		Physician	Midwife <sup>a</sup>	Other
<b>Metro</b>				
All. . . . .	2,970,059	96.3	3.0	0.6
White . . . . .	2,290,927	96.4	3.0	0.6
Black . . . . .	538,822	96.1	3.2	0.7
-----				
Urban places 50,000+				
All. . . . .	1,483,338	95.7	3.5	0.7
White. . . . .	993,102	95.6	3.6	0.8
Black . . . . .	402,301	96.2	3.2	0.7
-----				
Urban places 10,000-49,999				
All. . . . .	579,993	96.6	2.9	0.5
White. . . . .	485,907	96.8	2.7	0.5
Black . . . . .	67,160	95.2	4.1	0.6
-----				
<b>Balance of area</b>				
All. . . . .	906,728	97.1	2.4	0.5
White. . . . .	811,918	97.1	2.4	0.5
Black . . . . .	69,361	96.9	2.4	0.7
-----				
<b>Nonmetro</b>				
All. . . . .	839,335	96.6	2.8	0.6
White. . . . .	701,561	97.1	2.3	0.6
Black . . . . .	102,745	96.5	3.0	0.5
-----				
<b>Urban places 10,000-49,999</b>				
All. . . . .	183,260	97.1	2.5	0.4
White . . . . .	146,735	97.4	2.2	0.4
Black . . . . .	29,343	96.4	3.2	0.3
-----				
<b>Balance of area</b>				
All. . . . .	656,075	96.5	2.9	0.6
White . . . . .	554,826	97.0	2.4	0.6
Black . . . . .	73,402	96.5	2.9	0.5

<sup>a</sup>Midwife includes lay midwives, and certified and noncertified nurse midwives.

SOURCE: U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, 1987 *Nativity*, unpublished tabulation, November 1988.

deliver obstetric care (table 15-11),<sup>22</sup> and other areas are without available obstetric services because many physicians trained to provide obstetric services do not provide them. In 1988, for example, there was in North Carolina 1 nonmetro county without a physician trained to deliver obstetric care (table 15-11), but 18 nonmetro counties that lacked obstetric services because available physicians and CNMs were not providing them (512).

G/FPs are particularly well suited as obstetric providers in areas of low population density because they can provide both obstetric and nonobstetric care.<sup>23</sup> Consequently, G/FPs generally require a

smaller population base (3,000 to 4,000 residents) than do obstetricians (who require about 11,000 residents) (331). In 1988, 9 out of every 10 FPs (91 percent) had hospital admitting privileges, but of these less than one-third (29 percent) reported that they currently practiced obstetrics (545). FPs in rural areas are almost twice as likely as urban FPs to offer routine obstetric care (43 v. 23 percent). There are, however, sizeable regional inferences in the extent to which rural FPs provide obstetric care. Only 15 percent of rural FPs provide obstetric care in the South Atlantic region, compared with 70 percent in the West North Central region (table 15-12).

<sup>22</sup>In contrast, there are only 2 metro counties, with a total population of 21,900, that are without a physician trained to provide obstetric care.

<sup>23</sup>In 1985, 53 percent of all physician visits and 70 percent of adult visits to physicians in rural areas were to family physicians (447).

**Table 15-10—Ratio of Active MD General/Family Practitioners, Active MD Obstetrician/Gynecologists, Active MD Pediatricians, and Active DOs per 100,000 Reproductive-Age Women by State and Census Region and Division, 1987-88<sup>a</sup>**

	Number of physicians per 100,000 reproductive-age women <sup>b</sup>									
	MD general/family practitioners		MD obstetrician/gynecologists		MD pediatricians <sup>c</sup>		DOs <sup>d</sup>		G/FP + OB/GYN + DO	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
<b>United States.....</b>	108.0	137.1	61.4	24.5	69.7	22.3	44.0	30.8	213.4	192.4
<b>Northeast.....</b>	87.0	121.4	66.4	31.7	86.4	34.1	51.8	35.4	205.2	188.5
New England.....	73.7	154.7	63.5	37.5	83.3	50.6	18.5	39.7	155.7	231.9
Connecticut.....	73.4	NA	75.8	NA	87.5	NA	8.0	NA	157.2	NA
Maine.....	138.9	172.8	46.7	32.8	52.0	35.4	116.5	77.1	302.1	282.7
Massachusetts.....	62.3	127.3	60.3	48.5	86.4	54.6	10.5	12.1	133.1	187.9
New Hampshire.....	97.1	172.7	50.6	42.4	54.1	70.7	7.6	12.6	155.3	227.7
Rhode Island.....	71.0	NA	58.5	NA	88.0	NA	45.6	NA	175.1	NA
Vermont.....	132.0	133.6	86.5	33.7	111.5	53.4	11.4	26.7	229.9	194.0
Middle Atlantic.....	91.6	108.1	67.4	29.3	87.5	27.5	63.2	33.7	222.2	171.1
New Jersey.....	80.4	NA	63.9	NA	86.0	NA	78.5	NA	222.8	NA
New York.....	75.1	103.5	74.5	31.7	105.1	30.1	18.9	8.9	168.5	144.1
Pennsylvania.....	127.8	112.5	58.0	27.1	59.0	25.0	126.0	57.6	311.8	197.2
<b>Midwest.....</b>	112.3	145.2	54.7	18.2	61.1	17.0	71.4	50.4	238.4	213.8
East North Central...	106.6	130.8	54.4	19.9	60.2	18.9	75.2	40.6	236.2	191.3
Illinois.....	107.3	143.3	59.2	21.8	69.1	20.4	30.9	16.1	197.4	181.2
Indiana.....	146.4	139.7	40.5	17.3	42.2	13.7	23.4	17.8	210.3	174.8
Michigan.....	78.2	104.8	56.9	18.9	54.7	18.1	164.9	94.9	300.0	218.6
Ohio.....	106.8	102.1	55.0	22.6	64.4	21.3	87.8	55.2	249.6	179.9
Wisconsin.....	121.8	177.7	49.0	17.5	56.5	20.5	28.6	14.2	199.4	209.4
West North Central...	131.0	163.4	55.6	16.1	63.8	14.5	59.1	62.8	245.7	242.3
Iowa.....	143.2	156.7	40.3	12.5	51.5	11.0	138.6	54.3	322.1	223.5
Kansas.....	140.6	168.4	52.7	20.6	55.8	22.9	60.2	46.6	253.5	235.6
Minnesota.....	170.6	206.7	49.3	14.3	62.2	11.2	6.1	10.5	226.0	231.5
Missouri.....	78.5	96.8	67.6	18.1	74.1	12.4	93.5	178.1	239.6	293.0
Nebraska.....	138.5	201.2	58.8	11.4	67.7	15.4	8.4	4.0	205.7	216.6
North Dakota.....	169.9	187.1	56.6	24.8	52.0	18.0	12.2	11.3	238.7	223.2
South Dakota.....	204.9	193.8	50.2	16.4	48.2	17.4	10.0	28.9	265.1	239.1
<b>South.....</b>	107.5	128.6	64.3	25.8	65.8	22.1	31.4	18.1	203.2	172.5
South Atlantic.....	112.0	123.6	70.5	31.7	73.5	27.7	29.4	14.6	211.9	169.9
Delaware.....	109.7	73.6	63.5	35.7	72.2	39.9	69.3	25.2	242.5	134.5
Distr. of Columbia.	91.4	NA	138.8	NA	133.1	NA	18.3	NA	248.5	NA
Florida.....	140.4	145.1	64.5	31.3	65.2	28.1	65.1	35.1	270.0	211.5
Georgia.....	74.6	113.1	64.7	32.1	58.5	21.9	20.7	11.8	160.0	157.0

NOTE: NA = does not apply. In Rhode Island and Connecticut, some counties are part MSA and part non MSA. These counties were categorized as MSA counties in the Area Resource File. In Alaska, the entire State is categorized as MSA (Alaska has no counties).

(continued on next page)

Table 15-10—Ratio of Active MD General/Family Practitioners, Active MD Obstetrician/Gynecologists, Active MD Pediatricians, and Active DOs per 100,000 Reproductive-Age Women by State and Census Region and Division, 1987-88<sup>a</sup>—Continued

	Number of physicians per 100,000 reproductive-age women <sup>b</sup>									
	MD general/family practitioners		MD obstetrician/gynecologists		MD pediatricians <sup>c</sup>		DOs <sup>d</sup>		GP/FP + OB/GYN + DO	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
Maryland.....	89.9	122.5	98.8	59.1	116.3	36.1	10.8	7.2	199.5	188.9
North Carolina....	106.6	119.4	61.9	31.7	65.3	29.8	7.7	3.8	176.2	154.9
South Carolina....	140.9	124.0	53.7	28.5	46.8	25.6	5.4	6.5	200.0	159.0
Virginia.....	102.8	141.0	62.2	31.4	68.5	26.5	11.3	5.7	176.3	178.1
West Virginia.....	145.2	122.5	54.1	28.0	44.4	32.4	40.1	52.0	239.4	202.5
East South Central...	109.2	122.0	61.9	23.1	62.6	20.8	8.3	10.9	179.4	156.0
Alabama.....	107.2	112.1	59.1	20.4	53.8	16.3	8.4	7.2	174.7	139.7
Kentucky.....	126.4	125.9	57.1	24.7	68.1	25.0	9.5	9.2	193.0	159.8
Mississippi.....	108.7	126.6	61.8	28.9	64.5	23.5	9.6	10.9	180.1	166.4
Tennessee.....	101.7	120.5	66.6	16.9	66.1	16.3	7.4	16.3	175.7	153.7
West South Central...	100.0	143.0	55.9	19.1	55.8	14.9	43.8	30.7	199.7	192.8
Arkansas.....	150.4	183.5	57.3	20.1	63.1	15.0	6.7	11.2	214.4	214.8
Louisiana.....	82.8	120.7	69.6	22.4	65.8	15.6	3.6	3.3	156.0	146.4
Oklahoma.....	108.2	125.1	51.1	20.0	50.7	15.5	126.6	74.8	285.9	219.9
Texas.....	99.5	143.2	53.3	16.6	53.7	14.3	43.8	32.8	196.6	192.6
<b>West.....</b>	<b>127.0</b>	<b>157.2</b>	<b>59.0</b>	<b>29.8</b>	<b>65.8</b>	<b>26.9</b>	<b>25.0</b>	<b>25.8</b>	<b>211.0</b>	<b>212.8</b>
Mountain...	111.0	151.0	56.6	27.1	57.8	24.7	53.2	29.9	220.8	208.0
Arizona...	125.7	144.8	65.2	30.2	65.4	30.9	105.3	47.0	296.2	222.0
Colorado...	106.5	174.7	53.3	14.5	57.5	17.3	46.3	55.9	206.1	245.1
Idaho.....	119.7	146.6	41.3	26.1	33.0	20.5	16.5	17.8	177.5	190.5
Montana...	71.9	168.8	41.9	33.8	45.9	26.7	8.0	19.7	121.8	222.3
Nevada.....	96.1	184.5	53.3	26.0	31.2	21.3	32.7	23.7	182.1	234.2
New Mexico.....	119.	123.1	60.6	30.6	68.8	31.2	51.9	34.7	232.0	188.4
Utah.....	93.5	152.1	55.0	24.9	64.1	21.2	6.0	7.5	154.1	184.5
Wyoming.....	199.1	139.7	38.8	29.5	33.3	23.8	2.8	12.5	241.3	181.7
Pacific.....	131.7	166.6	59.7	33.8	67.9	30.0	17.6	19.8	208.5	220.2
Alaska.....	127.2	NA	29.4	NA	33.8	NA	27.2	NA	184.4	NA
California.....	129.8	170.8	61.8	34.7	72.1	29.4	13.3	13.6	204.6	219.1
Hawaii.....	78.5	176.6	74.4	69.9	80.1	66.0	28.7	19.4	181.1	265.9
Oregon.....	115.0	150.2	59.0	30.8	48.5	24.6	42.4	22.0	216.9	203.0
Washington.....	164.5	175.5	46.7	25.5	50.7	26.6	31.7	25.5	242.4	226.5

NOTE: NA = does not apply. In Rhode Island and Connecticut, some counties are part MSA and part non MSA. These counties were categorized as MSA counties in the Area Resource File. In Alaska, the entire State is categorized as MSA (Alaska has no counties).

<sup>a</sup>Active MDs and DOs (doctors of osteopathy) include physicians in patient care, research, administration, and teaching. Data from the American Medical Association as of Jan. 1, 1988. Data from the American Osteopathic Association as of 1987.

<sup>b</sup>Population of women age 15 to 44, 1984. Based on estimates from the Current Population Survey, U.S. Bureau.

<sup>c</sup>Does not include pediatric subspecialties.

<sup>d</sup>Includes all active DOs, regardless of specialty orientation.

SOURCE: T.C. Ricketts, Rural Health Research Center, University of North Carolina, Chapel Hill, NC. Analysis of unpublished data (provided by the Health Resources and Services Administration) conducted under contract to the Office of Technology Assessment.

**Table 15-11-Number and Resident Population of Nonmetropolitan Counties Without an Active General Practitioner, Family Practitioner, or Obstetrician/Gynecologist, by Region and State, 1988<sup>a,b</sup>**

	Number of nonmetro counties (A)	Resident population of column A		Number of nonmetro counties (A)	Resident population of column A
United States . . . . .	147	528,300			
Northeast . . . . .	1	4,900	South (continued):		
New England . . . . .	0	0	East South Central . . . . .	9	63,600
Middle Atlantic . . . . .	1	4,900	Alabama . . . . .	1	13,200
New York . . . . .	1	4,900	Kentucky . . . . .	2	14,400
Midwest . . . . .	59	184,800	Mississippi . . . . .	3	19,200
East North Central . . . . .	4	25,500	Tennessee . . . . .	3	16,800
Illinois . . . . .	1	5,300	West South Central . . . . .	23	84,700
Indiana . . . . .	1	5,400	Arkansas . . . . .	1	8,200
Michigan . . . . .	1	1,900	Louisiana . . . . .	1	24,500
Wisconsin . . . . .	1	12,900	Texas . . . . .	21	52,000
West North Central . . . . .	55	159,300	West . . . . .	34	72,100
Kansas . . . . .	4	12,600	Mountain . . . . .	29	58,300
Missouri . . . . .	2	16,100	Colorado . . . . .	6	11,600
Nebraska . . . . .	22	48,000	Idaho . . . . .	4	13,100
North Dakota . . . . .	12	42,400	Montana . . . . .	11	17,800
South Dakota . . . . .	15	40,200	Nevada . . . . .	2	3,200
South . . . . .	53	266,500	New Mexico . . . . .	2	5,900
South Atlantic . . . . .	21	118,200	Utah . . . . .	4	6,700
Florida . . . . .	2	14,200	Pacific . . . . .	5	13,800
Georgia . . . . .	15	73,300	California . . . . .	1	1,200
North Carolina . . . . .	1	9,700	Oregon . . . . .	3	5,000
Virginia . . . . .	3	21,000	Washington . . . . .	1	7,600

<sup>a</sup>Includes physicians in patient care, research, administration, and teaching. Includes all active doctors of osteopathy (DOs) regardless of specialty.

<sup>b</sup>MD data as of Jan. 1, 1988. DO data as of 1987. Population as of 1987.

SOURCE: T.C. Ricketts, Rural Health Research Center, University of North Carolina, Chapel Hill, NC. Analysis of unpublished data (provided by the Health Resources and Services Administration) conducted under contract to the Office of Technology Assessment.

FPS in rural areas are much more likely than those in urban areas to provide complicated obstetric delivery services, services to high-risk patients, and cesarean sections (table 15-12) (545). Nonetheless, the majority of rural FPS do not handle complications, so they are heavily dependent on obstetricians for backup.

CNMs are registered nurses with additional training to provide obstetric and gynecological care to essentially normal newborns and women. As of 1990, nearly 4,000 CNMs had been certified by the American College of Nurse-Midwives and an estimated 60 percent were providing obstetric services<sup>24</sup> (see ch. 10 for a discussion of the supply and distribution of CNMs). Most CNMs are in urban areas and most are employed by hospitals, HMOs, or birth centers (44 percent) or by physicians (25 percent) (342). Nearly 90 percent of CNMs that

deliver babies do so in hospitals (342), but practitioners in many States report medical staff bylaws that prohibit appointment of nonphysician care managers. (See ch. 11 for a discussion of State regulatory barriers that affect mid-level practitioners.)

#### ***The Impact of Medical Professional Liability Issues on Obstetric Provider Availability in Rural Areas—In***

some cases, the conditions of rural practice have contributed to the decline of rural obstetric providers—the lack of coverage for time off, limited consultation opportunities, and difficulties with referrals to larger hospitals (336). Increasingly, however, the high costs of premiums for medical malpractice coverage and fears of lawsuits have been cited as major factors contributing to the decline. A recent report of the Institute of Medicine (IOM) concluded that there has been a significant decline in the number of obstetric providers practicing

<sup>24</sup>Estimates are based on a 1988 survey of 2,363 members of the American College of Nurse-Midwives. The survey response rate was 76 percent (342).

**Table 15-12—Percentage of Family Physicians Who Care for Obstetric Patients at Various Levels, by Metropolitan/Nonmetropolitan Area and Census Region, July 1988**

Census region	Routine care	Complicated delivery	High risk	Cesarean sections
<b>Total</b>				
Metro. . . . .	22.9	5.9	3.2	2.3
Nonmetro. . . . .	43.1*	23.2*	15.3*	12.6*
<b>New England</b>				
Metro. . . . .	17.1	4.3	2.9	2.1
Nonmetro. . . . .	41.9*	10.5	5.8	2.3
<b>Middle Atlantic</b>				
Metro. . . . .	11.9	1.3	0.0	0.0
Nonmetro. . . . .	18.2	3.6	0.0	0.0
<b>East North Central</b>				
Metro. . . . .	31.2	7.3	4.6	0.5
Nonmetro. . . . .	60.9*	33.3*	24.1*	9.2*
<b>West North Central</b>				
Metro. . . . .	48.6	14.4	7.5	4.8
Nonmetro. . . . .	69.8*	42.9*	23.6*	19.8*
<b>South Atlantic</b>				
Metro. . . . .	10.4	4.9	2.4	1.2
Nonmetro. . . . .	15.0	5.0	2.0	0.0
<b>East South Central</b>				
Metro. . . . .	8.5	1.4	0.7	0.7
Nonmetro. . . . .	16.4*	9.4*	7.0*	6.3*
<b>West South Central</b>				
Metro. . . . .	21.4	7.3	3.6	6.3
Nonmetro. . . . .	39.7*	26.4*	23.1*	30.6*
<b>Mountain</b>				
Metro. . . . .	21.0	5.9	1.6	1.6
Nonmetro. . . . .	58.4*	28.5*	24.1*	18.2*
<b>Pacific</b>				
Metro. . . . .	27.4	5.7	3.9	3.9
Nonmetro. . . . .	44.9*	22.4*	12.2*	16.3*

\*NOTE: Statistically significant at  $P = 0.25$  using a standardized normal Z test for comparing proportions (a one-tailed test).

<sup>a</sup>Based on a survey of active members of the American Academy of Family physicians.

SOURCE: G. Schmittling and C. Tsou, "Obstetric Privileges for Family Physicians: A National Study," *Journal of Family Practice* 29(2):179-184, 1989.

ingin rural areas since the early 1980s. Furthermore, a substantial number of providers are limiting the services provided to high-risk women because they fear being sued. Physicians are increasingly reporting a reduction in their Medicaid caseloads, at least in part because of professional liability concerns (289).

A number of States have instituted reforms in response to concerns over obstetric malpractice costs (box 15-B). Nevertheless, the IOM report

concluded that the costs of litigating obstetrical malpractice claims have not decreased greatly. Their suggested interventions to curb the decline of obstetrical providers included (289):

- State alternatives to the tort system (e.g., no-fault compensation for certain impaired infants),
- federally sponsored demonstration projects and studies of proposed State legislation,

**Box 15-B—Selected State Responses to Obstetric Shortages and Malpractice Insurance and Liability Issues**

**Arkansas**--Established a grant program to increase access to nurse-midwifery services in medically underserved areas (533a).

**Arizona**--Subsidizes physicians who provide obstetric services in rural areas (533a).

**Colorado--Limits** total liability to \$1,000,000 and noneconomic losses to \$250,000, makes physicians not liable where birth injury results from genetic disorders or other unavoidable natural causes, and establishes a 3-year statute of limitations (532).

**Florida--In 1988**, enacted an injured-infants plan that includes no-fault compensation, voluntary arbitration systems, and immunity for physicians treating patients in emergency rooms (367). Established a grant program to increase access to nurse-midwifery services in medically underserved areas (533a).

**Georgia--Makes** loans to physicians who recently completed their medical education. Loans may be repaid through practice in rural areas. Priority will be given to physicians specializing in, and actively practicing, obstetrics (428).

**Mississippi--Expanded** the definition of "State employee" to include physicians providing services under a contract with the State so the physician avoids individual liability exposure (38).

**Montana--Limits** the immunity of providers who render birth-related services in emergency situations (292).

**Nevada--In 1987**, created a pretrial medicolegal screening panel in hopes of curbing the excessive cost of malpractice insurance. In 1989, Nevada malpractice premiums decreased 11 percent (505).

**North Carolina--In 1988**, funded a pilot program to compensate family physicians and obstetricians who agree to provide prenatal and obstetric care in counties which are undersexed in respect to these services (331).

**South Carolina**--Expanded the definition of "State employee" to include physicians providing services that are paid for by a salary appropriated by a governmental entity, thereby avoiding individual liability exposure (38).

**Texas**--Assumes limited liability for malpractice claims against doctors who provided at least 10 percent charity care during the previous insurance policy year. Charity care includes services provided under the State's indigent care program, Medicaid, Maternal and Child Health block grant programs, and primary health and migrant health programs. Providers must still maintain malpractice insurance but eligible practitioners may qualify for a premium discount, in addition to added liability protection provided by the State (292).

**Virginia--In 1987**, enacted a no-fault compensation program for birth-related injuries (367).

**Washington--Contracts** with or directly employs qualified obstetric providers, then pays, through higher reimbursement, that portion of their malpractice premiums that represents the care they provided to eligible (indigent or underserved) pregnant women (292).

- . a detailed, federally sponsored national database on malpractice claims that would include information on malpractice insurance rates, payouts, settlements, and claims,
- . more systematic assessment of new obstetric and related technologies,
- . extending the personal immunities offered by the Federal Tort Claims Act, or equivalent coverage, to all practitioners of obstetric care at Community and Migrant Health Centers (C/MHCs),
- . State programs to indemnify or subsidize the medical professional liability premiums of obstetric providers who participate in Medicaid or otherwise provide care to low-income women, and

- . expansion of the National Health Service Corps (NHSC).

FPs delivering obstetric services pay malpractice insurance rates that are two to three times higher than those of their counterparts who do not practice obstetrics (348). In some States, insurers are beginning to adjust physicians' malpractice insurance rates for the number of deliveries performed (528). Where such adjustments are not made, however, insurance premiums continue to be a greater burden for rural G/FPs and CNMs because these providers generally have fewer obstetric patients over whom to spread the cost. Physicians who provide backup for CNMs often have to pay additional malpractice insurance premiums (29).

Estimating the impact of malpractice concerns on the availability of rural obstetric providers is difficult because there are few national data available that distinguish rural from urban providers. Information about obstetric providers' responses to malpractice issues comes from two surveys: one conducted by the American College of Obstetricians and Gynecologists (ACOG) and one by the American Academy of Family Physicians (AAFP). In the most recent ACOG survey (1987), 12 percent of obstetrician/gynecologists reported that they no longer practiced obstetrics because of the risk of malpractice suits. An additional 27 percent reported decreasing the level of high-risk obstetric care, and 13 percent reported decreasing the number of deliveries they handled (29).<sup>25</sup> This survey did not distinguish urban from rural obstetricians.

According to a 1986 AAFP survey, the proportion of FPs giving up obstetrical practice is even higher than that observed among obstetricians. This survey showed that 23 percent of AAFP members who had ever provided obstetric care had stopped because of malpractice concerns (12). This development is a potentially serious threat to access to obstetric care in rural areas, because rural women are more dependent on FPs for their care. From a 1988 survey that distinguished rural from urban FPs, however, it appears that rural FPs are much more likely than urban FPs to provide obstetric services, especially to high-risk patients (see table 15-12) (545).<sup>26</sup> Among FPs that were not performing obstetrics, more urban than rural FPs reported that they did not practice obstetrics because it was "not desired" (59 v. 50 percent), while more rural than urban providers cited "liability costs prohibitive" (34 v. 25 percent) as a reason for not performing obstetrics (table 15-13). Based on the AAFP survey results, OTA estimates that there could be a significant (up to 42 percent) increase in the availability of FPs providing obstetric

services in rural areas if there were a decline in premium costs.<sup>27</sup>

In a 1988 survey of C/MHC directors,<sup>28</sup> two-thirds (67 percent) of respondents indicated that the medical malpractice problem had affected either their ability to furnish obstetric services or their scope of services (278). Centers reported difficulties in recruiting and retaining staff and in establishing and maintaining contractual arrangements with providers. Many centers have relied on physicians available through the NHSC. The Federal Tort Claims Act formerly insured both commissioned officers of the NHSC and NHSC scholarship graduates who worked as civilian employees of the Public Health Service, but since 1984 most NHSC physicians placed in health centers have not been covered by the Act because they no longer receive their salaries directly from the NHSC. Consequently, health centers have had to provide malpractice coverage from Federal grant funds and other revenue sources. As malpractice insurance costs have increased, the magnitude of this burden has increased in tandem, reducing the centers' ability to provide care. Furthermore, with declining numbers of NHSC physicians available, centers' salary costs have increased in order to compete for physicians on the open market.

Forty-three percent of C/MHC representatives surveyed reported turning patients away because of staff shortages (278). Several centers reported that they had no one to whom they could refer the patients they could not serve, either because private providers would not take the patients or because there were no other locally available providers. Several centers also reported that they were forced to discontinue care of women at the time of delivery because the FPs or CNMs on staff were not permitted to perform deliveries<sup>29</sup> and could not identify community physicians to whom they could refer patients for delivery care. One center reported

<sup>25</sup>These data represent responses to a survey of ACOG members. Fewer than one-half of those surveyed (48 percent) responded to the survey (29). An estimated 63 percent of obstetrician/gynecologists are members of ACOG (125).

<sup>26</sup>This survey included the responses of active members of the American Academy of Family Physicians. More than three-fourths (76.2 percent) of those surveyed responded. An estimated 66 percent of general and family practitioners are members of AAFP (520).

<sup>27</sup>This estimate assumes that the AAFP survey is applicable to all GP/FPs, and that those practitioners that stated that prohibitive liability costs prevented them from practicing obstetrics would indeed enter, or reenter obstetric practice if costs were reduced or eliminated. The AAFP survey did not specifically ask about fear of a malpractice suit as a deterrent to practice and even if malpractice insurance costs were reduced, some physicians may not enter or reenter obstetric practice because of such fears.

<sup>28</sup>At the time of the survey there were 546 Community and Migrant Health Centers. Fifty-eight of a sample of 139 centers (42 percent) responded to the survey (278).

<sup>29</sup>Center providers were prohibited from delivering babies either by their malpractice insurance policies or because local hospitals allowed deliveries only by obstetricians (278).

**Table 15-13—Percentage of Active AAFP Members Who Perform or Do Not Perform Routine Obstetric Care in Their Hospital Practice, by Region and Location of Practice,<sup>a</sup> 1988**

	Total number	in hospital practice	with consultation	Not performed percent/(number)	AND					No reason given
					Not desired	Privileges denied	Liability costs prohibitive	No hospital department	No hospital practice	
<b>Total<sup>b</sup></b>	34,444	29.0	0.3	70.7 (24,333)	33.3	0.7	42.8	3.4	9.7	2.3
Metro <sup>c</sup>	17,508	23.3	0.3	76.4 (13,381)	59.1	0.7	24.7	3.4	9.4	2.4
Nonmetro <sup>c</sup>	9,079	43.4	0.2	56.4 (5,123)	50.3	0.4	32.8	4.7	9.4	2.4
<b>Northeast<sup>b</sup></b>	5,233	14.7	0.4	84.9 (4,443)	61.0	0.8	18.9	5.2	11.1	3.0
Metro <sup>c</sup>	2,980	13.1	0.5	86.4 (2,575)	65.9	0.6	16.6	4.7	9.1	3.1
Nonmetro <sup>c</sup>	894	28.3	0.0	71.7 (641)	52.7	0.0	31.4	5.5	6.4	3.9
<b>Midwest<sup>b</sup></b>	9,868	47.4	0.2	52.4 (5,174)	56.6	0.0	42.2	4.0	11.0	1.5
Metro <sup>c</sup>	4,791	36.8	0.0	63.2 (3,026)	57.3	0.0	27.5	3.8	9.8	1.7
Nonmetro <sup>c</sup>	3,154	66.0	0.0	34.1 (1,074)	51.0	0.0	33.8	1.9	11.0	2.4
<b>South<sup>b</sup></b>	11,573	17.5	0.3	82.2 (9,509)	54.9	1.4	24.6	4.8	11.0	4.1
Metro <sup>c</sup>	5,181	14.2	0.5	85.4 (4,423)	59.0	1.8	23.3	3.9	9.4	2.7
Nonmetro <sup>c</sup>	1,516	31.7	0.4	47.9 (726)	44.6	0.0	29.3	6.9	10.2	1.9
<b>West<sup>b</sup></b>	7,772	32.5	0.3	67.3 (5,228)	49.9	0.1	34.3	4.3	11.0	1.1
Metro <sup>c</sup>	4,555	28.0	0.3	73.7 (3,356)	55.8	0.2	30.4	1.4	10.6	1.6
Nonmetro <sup>c</sup>	1,516	51.7	0.4	47.9 (726)	44.6	0.0	45.9	0.0	6.8	2.9

<sup>a</sup>Responses shown are the weighted responses of 3,352 respondents. Responses were weighted to reflect the responses of active AAFP members. The survey was conducted in 1988. <sup>b</sup>Obstetric practice was not answered by 1.3 percent of respondents.

<sup>c</sup>Residence is unknown for 25.7 percent of Northeastern physicians, 19.5 percent of Midwestern physicians, 24.7 percent of Southern physicians, and 22.3 percent of Western physicians.

SOURCE: The American Academy of Family Physicians, tabulation prepared for OTA by Chris Robinson and Gordon Schmittling, 1989.



that it was forced to send all patients—nearly 700 a year—to the local hospital emergency room for deliveries (278).

**Provider Participation in Medicaid--Many obstetric providers do not provide services to women who are uninsured or who have Medicaid coverage.** Although States have expanded their Medicaid programs to cover more poor women, there is widespread concern that physicians will be not be available to care for newly eligible women (347). According to a 1987 survey of all 50 States, 89 percent of representatives of Maternal and Child Health block-grant-funded programs and 63 percent of Medicaid program representatives said that they were experiencing significant problems in Medicaid provider participation for maternity care. Low participation was found to be a particularly acute problem in rural areas: 35 of the 50 States reported problems in rural areas while only 3 said they had problems in suburban or urban areas (347).

In general, providers who do not serve Medicaid patients report that their major reasons are low reimbursement and concerns about malpractice suits and malpractice costs (347). In 1986, the average Medicaid fee was approximately 44 percent lower than the average national charge for total obstetric care (\$1,437).<sup>30</sup> Many State agencies are trying to improve provider participation through a variety of mechanisms that include raising fees, using alternative providers (e.g., CNMs), providing case management, and initiating outreach and public relations activities aimed at providers (347).

Although provider participation in Medicaid seems to be a problem, evidence from provider surveys shows that physicians in smaller communities are more likely than other physicians to provide services to at least some Medicaid patients. An estimated 63 percent of obstetricians provide services to Medicaid patients, but 85 percent of obstetricians in communities with 50,000 or fewer residents provide obstetric services to this group compared with just

over one-half (52 percent) in communities with over 500,000 residents (28).<sup>31</sup> Furthermore, obstetricians in smaller communities tend to have practices that include a higher proportion of Medicaid deliveries (28).<sup>32</sup>

Although it would seem that low physician participation might hamper access to care, a government study found that few women who had recently delivered a baby and were uninsured or had Medicaid coverage had had problems finding a health care provider to see them (614). According to the 1986-87 General Accounting Office (GAO) survey, rural uninsured or Medicaid-insured women were more likely to have had adequate prenatal care (46 percent)<sup>33</sup> than were women residing in large urban areas (29 percent) or other urban areas (42 percent) (table 15-14).<sup>34</sup> Furthermore, a higher proportion of uninsured or Medicaid-insured women in rural than urban areas reported no problems in receiving prenatal care (33 v. 25 percent) (table 15-15). In general, uninsured or Medicaid-insured women in all areas reported that not recognizing that they were pregnant, financial problems, and transportation problems posed the greatest barriers to obtaining care (table 15-15) (614). Less than 3 percent of the women surveyed reported the lack of 'local doctors, midwives, or nurses' as a barrier to care, but women in rural areas were more than twice as likely as urban women to report the absence of a provider as a barrier (4.6 v. 2.0 percent) (614). Eight percent of uninsured and Medicaid-insured women reported that they "could not get a doctor, midwife, or nurse to see them," but this problem was not greater in rural than in urban areas (table 15-15). The GAO investigators conclude that increasing reimbursement might expand the choice of providers available to Medicaid-eligible women, but it would not improve access to prenatal care as much as using limited resources to expand Medicaid eligibility (614). GAO's findings may not be applicable to all rural areas, however, because the study included women delivering in only 13 rural hospitals. Rural commu-

<sup>30</sup>As of 1986, Medicaid paid less than half of the prevailing community charges for obstetric care in at least 23 States. In Florida, Medicaid paid only 17.5 percent of the prevailing community charge whereas in Nebraska, Medicaid paid 76.1 percent of the community charge (347).

<sup>31</sup>A 1989 study of Alabama obstetric providers showed that rural towns with higher proportions of physicians accepting Medicaid cases were more likely to retain obstetric providers than rural towns with relatively few such providers (102a).

<sup>32</sup>A 1989 survey of pediatricians showed that overall participation in the Medicaid program has declined since 1983, but that pediatricians practicing in rural areas are more likely than urban pediatricians to participate and to have unrestricted participation in the Medicaid program (743).

<sup>33</sup>Adequate prenatal care was defined as care beginning in the first trimester and including 9 or more visits for a pregnancy of 36 or more weeks (614).

<sup>34</sup>Women were selected from 32 communities in 8 States to provide a mix of rural, medium-sized urban, and large metro areas in different parts Of the country (614).

**Table 15-14-Adequacy of Prenatal Care<sup>a</sup> for Medicaid Recipients and Uninsured Women, by Area of Residence, 1986-87**

	Total (1, 157 )	Inadequate <sup>b</sup>		Intermediate <sup>c</sup>		Adequate <sup>d</sup>	
		Number	Percent	Number	Percent	Number	Percent
Large urban <sup>e</sup> . . . . .	507	128	25.25	233	45.96	146	28.80
Medicaid . . . . .	197	42	21.32	94	47.72	61	30.96
Uninsured . . . . .	310	86	27.74	139	44.84	85	27.42
Other urban . . . . .	<b>348</b>	<b>66</b>	<b>18.97</b>	<b>135</b>	<b>38.79</b>	<b>147</b>	<b>42.24</b>
Medicaid . . . . .	198	30	15.15	81	40.91	87	43.94
Uninsured . . . . .	150	36	24.00	54	36.00	60	40.00
Rural . . . . .	302	36	11.92	128	42.38	138	45.70
Medicaid . . . . .	210	21	10.00	89	42.38	100	47.62
Uninsured . . . . .	92	15	16.30	39	42.39	38	41.30

<sup>a</sup>The Institute of Medicine prenatal care index (developed by D. Kessner) is used to classify the adequacy of prenatal care.

<sup>b</sup>Care beginning in third trimester or including 4 or fewer visits for a pregnancy of 34 or more weeks.

<sup>c</sup>Care beginning in the second trimester or including 5 to 8 visits for a pregnancy of 36 or more weeks.

<sup>d</sup>Care beginning in the first trimester and including 9 or more visits for a pregnancy of 36 or more weeks.

<sup>e</sup>Women delivering in 39 hospitals in 32 communities in 8 States were interviewed. Large urban includes large metro areas, other urban includes other metro areas.

SOURCE: U.S. Congress, General Accounting Office, Prenatal Care: Medicaid Recipients and Uninsured Women Obtain Insufficient Care, HRD-87-137 (Washington, DC: U.S. Government Printing Office, 1987).

nities without hospitals or other facilities are likely to have greater access barriers to obstetric services.

#### Inability To Pay for Care

In 1989, the average charge for a vaginal delivery in the United States was \$4,334 (including physician and hospital charges), but the average charge was about 10 percent lower in rural than in urban areas (9,392).<sup>35</sup> Women in rural areas, particularly poor women, are more likely to have problems financing maternity services because they lack insurance coverage or their insurance does not cover maternity services.

Most women in both urban and rural areas (77 percent) have private insurance and a comparable proportion of rural and urban women of reproductive age are uninsured (18 percent v. 16 percent in 1985) (9). Rural women, however, have more private insurance coverage through individual policies that are less likely to cover maternity care (table 15-16) (9).<sup>36</sup> Consequently, rural women are more likely than urban women to be responsible for paying for their deliveries themselves. In 1982, 19 percent of

deliveries in rural areas, compared with 13 percent of urban deliveries, were classified as "self/family-pay" or "no payment." Nationally, about 6 percent of total hospital charges are not paid and maternity services account for about 40 percent of this uncompensated care (392). In 1982, rural deliveries accounted for nearly one-half (46 percent) of all uncompensated deliveries, yet rural deliveries represent only 23 percent of all deliveries (9). Some of the difficulties in paying for maternity care can be traced to the fact that the rural poor are less likely than the urban poor to have Medicaid coverage (530) (see ch. 2).

**Medicaid—As of 1984**, 17 percent of all delivery charges were paid by Medicaid (9). Between 1975 and 1990, the percentage of poor persons covered by Medicaid nationwide dropped from 63 to 50, but subsequent congressional changes have reversed the trend for pregnant women and infants (292). As of April 1990, all States must extend Medicaid eligibility to all pregnant women and children up to age 6 whose family incomes are at or below 133 percent of the Federal poverty level<sup>37</sup> (Public Law 101-290).

<sup>35</sup>The average charge for a cesarean delivery was \$7,633 (9). The cost to deliver and care for a premature baby with major complications can be much higher.

<sup>36</sup>Insurance policies that are through employers of 15 or fewer employees or that are not employment-related are not required to cover maternity care. Nationally, approximately 9 percent of reproductive-age women (about 5 million women) have private insurance policies that do not cover maternity care (8).

<sup>37</sup>The Federal poverty level in 1990 is \$10,560 for a family of three (419).

**Table 15-15-Barriers to Earlier or More Frequent Prenatal Care Cited by Medicaid Recipients and Uninsured Women Who Had Recently Delivered, 1986-87**

	<u>All women</u>				<u>Women with inadequate prenatal care<sup>a</sup></u>			
	Total (1,157)	Large urban (507)	Other urban ( 348)	Rural ( 302)	Total ( 726)	Large urban (361 )	Other urban (201 )	Rural ( 164)
<b>Barriers</b>								
<b>Logistical/access to health services:</b>								
Did not have anyone to take care of other children. . . . .	8.82	9.86	8.33	<b>7.62</b>	11.71	<b>6.47</b>	8.46	12.80
Could not miss work or school . . . . .	5.53	7.10	2.01	<b>6.95</b>	6.75	<b>8.03</b>	2.99	8.54
Did not have a way to get to clinic or doctor's office. . . . .	16.16	13.02	17.53	<b>19.87</b>	20.25	<b>16.07</b>	21.89	28.05
No local doctors, midwives, or nurses. . . . .	2.68	1.97	2.01	<b>4.64</b>	3.86	<b>2.49</b>	3.48	7.32
Could not get a doctor, midwife, or nurse to see them. . . . .	7.87	6.31	9.77	8.28	9.50	<b>8.03</b>	10.95	10.98
Did not know where to go for care. . . . .	8.90	11.83	4.02	9.60	11.16	<b>14.13</b>	5.97	10.98
Felt the wait in the doctor's office or clinic was too long. . . . .	8.64	10.85	7.18	6.62	11.57	<b>13.02</b>	10.45	9.76
Felt the office hours were not convenient. . . . .	5.19	7.30	3.74	3.31	6.34	<b>7.48</b>	4.98	5.49
Could not get an appointment earlier in pregnancy. . . . .	11.58	13.02	11.78	8.94	13.50	<b>14.40</b>	14.43	10.37
Cannot speak English well and could not find anyone who spoke their language. . . . .	1.04	1.97	0.00	0.66	1.24	<b>1.94</b>	0.0	1.22
Thought they might have problems with immigration people. . . . .	1.73	3.94	0.00	<b>0.00</b>	2.20	<b>4.43</b>	0.0	0.0
<b>Women's attitudes, beliefs, and experiences:</b>								
Did not think it was important to see a doctor, nurse, or another medical person earlier or more often. . . . .	6.83	8.48	5.45	5.63	8.68	<b>10.25</b>	6.97	7.32
Did not want to think about being pregnant . . . . .	10.72	11.05	9.77	11.26	13.64	<b>12.47</b>	15.42	14.02
Had too many other problems to worry about getting care. . . . .	8.30	9.86	7.47	6.62	11.29	<b>11.91</b>	11.44	9.76
Did not know that they were pregnant . . . . .	24.63	24.85	22.41	26.82	28.37	<b>27.15</b>	29.35	29.89
Not sure they wanted to have the baby so didn't go to see a doctor, midwife, or nurse. . . . .	7.09	9.47	4.60	5.96	8.82	<b>11.08</b>	6.47	6.71

Table 15-15—Barriers to Earlier or More Frequent Prenatal Care Cited by Medicaid Recipients and Uninsured Women Who Had Recently Delivered, 1986-87—Continued

	All women			Women with inadequate prenatal care				
	Total (1,157)	Large urban (507)	Other urban (348)	Rural (302)	Total (726)	Large urban (361)	Other urban (201)	Rural (164)
<b>Women's attitudes, beliefs, and experiences:</b>								
Knew what to do since they had been pregnant before.....	12.55	15.38	10.38	9.93	16.25	18.28	15.92	12.20
Were a little afraid of medical tests and examinations.....	8.38	10.85	6.90	5.96	10.19	12.19	8.46	7.93
Were afraid to find out they were pregnant.....	8.47	7.10	8.62	10.60	10.19	8.31	12.44	11.59
Did not want to tell baby's father, parents, or other family members.....	11.69	4.73	8.33	11.92	10.33	5.82	13.43	16.46
Did not like the doctor's or nurse's attitudes...	3.80	4.14	2.30	4.97	5.51	5.26	3.48	8.54
<b>Financing</b>								
Did not have enough money to pay for visits.....	22.39	25.64	16.09	24.17	28.37	31.02	21.89	30.49
Not eligible for Medicaid.....	4.93	4.93	4.60	5.30	5.37	5.26	5.47	5.49
Had problems with Medicaid.	6.83	7.10	7.47	5.63	8.82	8.59	9.45	8.54
Other..	4.41	5.33	4.60	2.65	5.23	5.26	5.47	4.88
<b>No Problem</b>	29.39	24.85	33.05	32.78	17.63	16.34	18.41	19.51

<sup>a</sup>Care beginning in third trimester or including four or fewer visit for a pregnancy of 34 or more weeks. <sup>b</sup>Women with insufficient prenatal care beginning in 32 communities in 8 States were interviewed.

SOURCE: U.S. Congress, General Accounting Office, Prenatal Care: Medicaid Recipients and Uninsured Women Obtain Insufficient Care, Report to the Chairman, Subcommittee on Human Resources and Intergovernmental Relations, Committee on Government Operations, House of Representatives, U.S. Congress, HRD-87-137 (Washington, DC: U.S. Government Printing Office, 1987).

Table 15-16-insurance Coverage of Women Aged 15 to 44 Years, by Residence and Marital Status, 1985

Residential status/ marital status	Group	Individual	Medicaid	Other government	None	Number of women in sample (1,000s)
All women.....	67%	10%	9%	4%	17%	56,152
Metro.....	68	9	9	3	16	41,610
Nonmetro.....	65	12	8	4	18	14,543
Married women.....	78	10	4	5	11	29,241
Metro.....	79	9	3	5	10	20,789
Nonmetro.....	74	12	4	4	14	8,452
Unmarried women.....	55	10	15	3	23	26,912
Metro.....	56	10	15	2	23	20,821
Nonmetro.....	52	12	14	3	25	6,092

NOTE: Percentages do not add Up to 100 because women may have insurance from more than one source.

SOURCE: Alan Guttmacher Institute, *The Financing of Maternity Care in the United States* (New York, NY: 1987), p. 379.

As of January 1990, 4 States had extended Medicaid providers (e.g., C/MHCs) to make temporary coverage of these groups to 150 percent of the Medicaid eligibility determinations for pregnant Federal poverty level, and 15 States had extended women and provide services until they are formally coverage to 185 percent, the fullest extent permitted in the program. This option helps to ensure by the Federal Government<sup>38</sup> (figure 15-1) (see ch. 3, table 3-3) (419). States categorized as "rural" from the Medicaid application site, are cared for are less likely than "urban" States (30 v. 46 percent before and during the application process. of States) to have opted to extend coverage beyond the level required by law.

Several States have streamlined the Medicaid application and enrollment process, making it easier for pregnant women to become eligible for coverage quickly. Most States, for example, no longer review pregnant women's assets when determining eligibility, but more "rural" than "urban" States review assets (19 v. 8 percent) (table 15-17). Asset restrictions can result in exclusion from Medicaid coverage of poor rural families that have small farms, work tools, or a car or truck (277).

"Rural" States are somewhat more likely than "urban" States to offer continuous (85 v. 75 percent of States) and presumptive eligibility (52 v. 46 percent of States) (table 15-17). States with continuous eligibility do not require a women to re-determine her eligibility during or shortly after her pregnancy. Continuous Medicaid coverage is important for rural families, who may have seasonal, fluctuating income levels that could otherwise periodically make them ineligible for benefits (277). Presumptive eligibility allows publicly funded clini-

Placing Medicaid eligibility determination workers at public health clinics (in some areas on a circuit riding basis) or allowing mail-in applications would probably facilitate Medicaid enrollment in rural areas (277). Rural States, however, have been less likely than urban States to "outstation" eligibility workers (26 v. 42 percent) to hospitals, local health departments, prenatal care clinics, and C/MHCs (table 15-17).

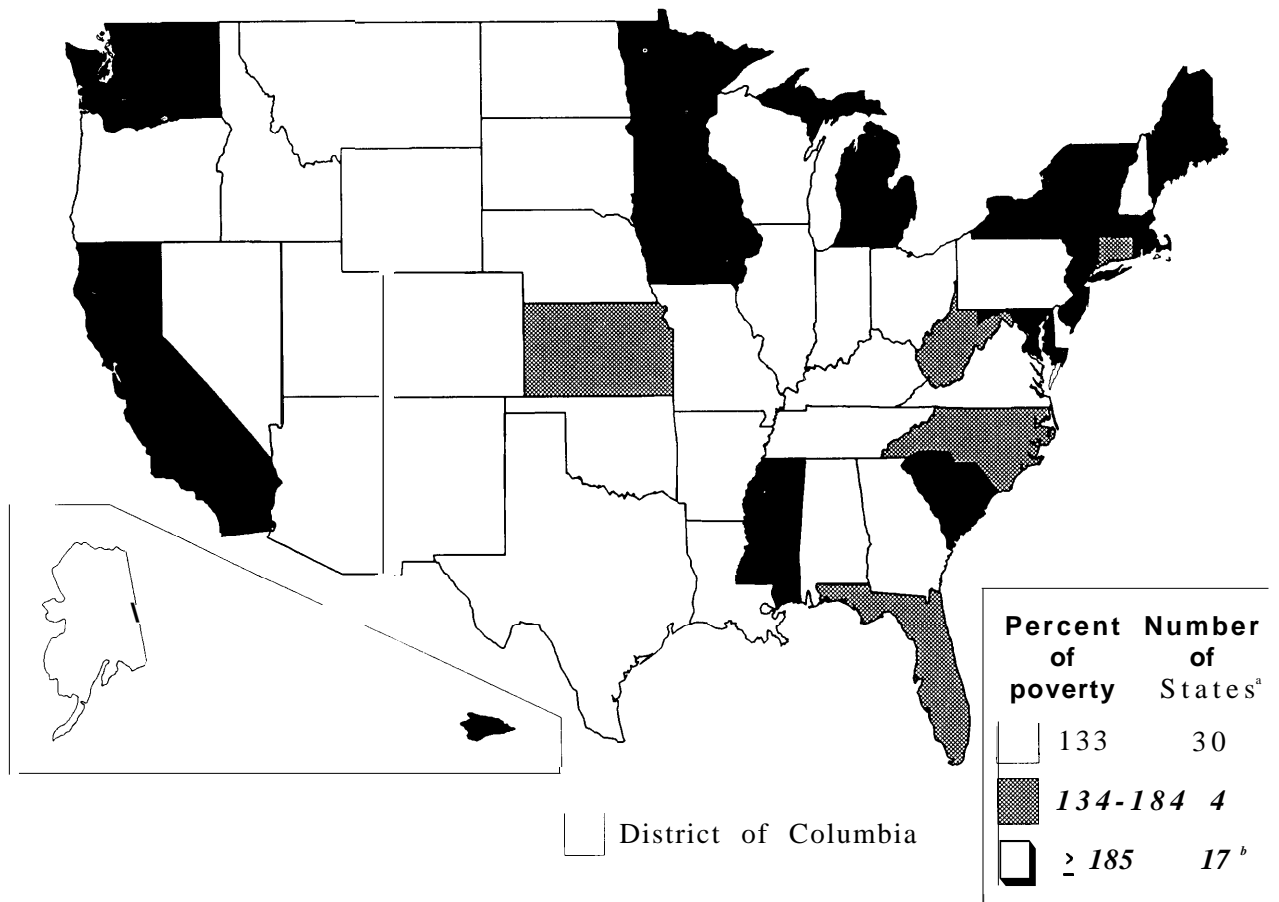
**Other Federal Sources of Services to Low-income Women**—In addition to the Medicaid program, several Federal Government programs are designed to increase access to maternal and infant care for poor and disadvantaged populations. Three of these are described below.

**The Maternal and Child Health (MCH) block grant** provides money to States to provide maternal and child health care to low-income, undeserved pregnant women, infants, and children (see ch. 3). In 1987, \$395 million was appropriated to the States (496), which used a portion of the money for free or subsidized prenatal and well-child care in public

<sup>38</sup>Several States have bolstered Medicaid expansions by enacting State-funded programs for pregnant women and children (419).

<sup>39</sup>The 27 States that ranked in the top 15 for percent of population living in nonmetro areas, or in the top 15 for numbers of nonmetro residents, were categorized here as rural. The remaining States and the District of Columbia were categorized as urban (see ch. 2, table 2-2).

Figure 15-1—Medicaid Coverage of Pregnant Women and Infants, April 1990



<sup>a</sup>Number of States and the District of Columbia

<sup>b</sup>Alaska uses State funds to extend coverage up to 185% in some parts of the State. California, New Jersey, and Vermont use State funds to extend coverage to 200%. Massachusetts and Hawaii have passed legislation to provide universal access to health care for all individuals in their States.

SOURCE: National Governors' Association, "State Coverage of Pregnant Women and Children—January 1990," Washington, DC, January 1990.

health clinics, health education, outreach to pregnant women, and transportation services. In 1987, MCH block grant expenditures accounted for about 10 percent of States' total maternal and child health expenditures. At that time, State health agencies used about one-third (31 percent) of MCH block grant funds—about \$121 million—to support local health departments (496).

**Community and Migrant Health Centers** provide primary health care services, including maternity services, in medically underserved areas (see chs. 3 and 5). Sixty-one percent (319) of C/MHCs are

located in rural areas. Services provided include preventive care, family planning, diagnostic and emergency care, and transportation. More than 200,000 pregnant women received maternity care at C/MHCs during 1988 (413). In many communities, C/MHCs are the sole source of comprehensive maternity and infant health care.<sup>40</sup>

In 1988, and again in 1989, C/MHCs received \$20 million in additional funding<sup>41</sup> to improve and strengthen their capacity to serve pregnant women and infants. The funding was to be used to enhance the ability of C/MHCs to:

<sup>40</sup>One-fifth of women receive care from a public provider (e.g., a hospital outpatient department, a C/MHC, or a local health department), while the remainder receive prenatal care in private physicians' offices (289).

<sup>41</sup>The additional funding came through DHHS' infant mortality initiative.

Table 15-17-Strategies To Streamline Medicaid Eligibility, January 1990

States	OBRA 1986 Options <sup>a</sup>			Other State initiatives		
	Dropped assets test	Continuous eligibility	Presumptive eligibility	Outstanding eligibility workers	Shortened application	Expedited eligibility <sup>b</sup>
Alabama . . . . .	X	X	x	X	X	
Alaska . . . . .	X	x				
Arizona . . . . .	X	X				X
Arkansas . . . . .	X	X	X	X <sup>c</sup>		
California . . . . .				X <sup>c</sup>		
Colorado . . . . .			X			
Connecticut . . . . .	X	X				
Delaware . . . . .	X	x		X	X	X
District of Columbia . .	X	X	X <sup>c</sup>			
Florida . . . . .	X	X	X	X	X	
Georgia . . . . .	X	X			X	X
Hawaii . . . . .	X	X	X			
Idaho . . . . .	X	X	X			
Illinois . . . . .		X	X			
Indiana . . . . .	X	X	X			
Iowa . . . . .		X	X			
Kansas . . . . .	X					X
Kentucky . . . . .	X	X		X	X	
Louisiana . . . . .	X	x	X	X		
Maine . . . . .	X	X	X			
Maryland . . . . .	X	X	X		X	
Massachusetts . . . . .	X	X	X		X	
Michigan . . . . .	X	X			X	
Minnesota . . . . .	X	X			X	X
Mississippi . . . . .	X	X		X		
Missouri . . . . .				X		
Montana . . . . .	X		X <sup>c</sup>			
Nebraska . . . . .	X	X	X			
Nevada . . . . .	X			x <sup>c</sup>		
New Hampshire . . . . .	X					
New Jersey . . . . .	X	X	X	X <sup>c</sup>		
New Mexico . . . . .	X	X	X			
New York . . . . .	X	X	X			
North Carolina . . . . .	X	x	X	x		
North Dakota . . . . .						
Ohio . . . . .	X	X				
Oklahoma . . . . .	X	X				
Oregon . . . . .	X	X				
Pennsylvania . . . . .	X		X		x	X
Rhode Island . . . . .	x					
South Carolina . . . . .	X	X		x	X	
South Dakota . . . . .	X	X			x	
Tennessee . . . . .	X	X	X	x		
Texas . . . . .		X	X	x	X	
Utah . . . . .	X	X	X	X		
Vermont . . . . .	X	x		X	X	X
Virginia . . . . .	X	X			X	
Washington . . . . .	X	x			X	
West Virginia . . . . .	X	X			X	
Wisconsin . . . . .	X	X	X			X
Wyoming . . . . .	X	X				X
Total . . . . .	44	41	25	17	19	9

<sup>a</sup>Options States may pursue that were introduced by the Omnibus Budget Reconciliation Act of 1986 (see text).<sup>b</sup>Expedited eligibility is the process whereby States give priority in the Medicaid determination process to applicants who are pregnant.<sup>c</sup>Future implementation date.

SOURCE: National Governors' Association, 'State Coverage of Pregnant Women and Children-January 1990,' Washington, DC, January 1990.

- provide comprehensive case-managed perinatal ambulatory care services,
- enrich the services of C/MHCs through addition of staff for outreach, health care, and nutrition education,
- develop or expand service delivery systems for women and infants, including contractual arrangements with community obstetricians to serve patients at health centers that do not have their own obstetrical staff and formal referral arrangements with local and regional hospitals, and
- better coordinate services between C/MHCs and other local public and private providers of health and health-related services (627a).

*The* infant mortality initiative funds were to be targeted to areas with high or increasing infant mortality rates. In 1988, however, this funding was sufficient to place projects in only one-third of health centers (206 centers), and many grantees did not receive enough to carry out necessary activities (412).

*The Supplemental Food Program for Women, Infants, and Children (WIC)* provides nutrition education and supplemental foods, such as infant formula, milk, eggs, and cereals, to low-income pregnant or nursing women, infants, and young children who are at 'nutritional risk.'<sup>42</sup> In 1988, 65 percent of WIC service sites were located in rural areas<sup>43</sup> and 40 percent of WIC participants were rural residents (730). In 1987, \$1.6 billion in Federal funds were used for the WIC program, but only 53 percent of pregnant women, infants, and children with incomes below the poverty level received WIC benefits (496,569).

#### Loss of Hospitals and Hospital-based Obstetric Care

In 1987 almost all deliveries (over 98 percent) in both urban and rural areas occurred in hospitals (650). Pregnant women need to be able to reach a hospital with delivery services within a relatively short period from onset of labor, but there are some reports that women in rural areas are traveling great distances to deliver their babies because local

services are unavailable (348). In Southeastern Missouri, for example, some high-risk pregnant women have to travel over 250 miles to reach a university hospital for their deliveries; in Texas, some pregnant women are sent by ambulance to deliver their babies in hospitals 150 miles away (348).

When rural hospitals close, ready access to delivery services diminishes. However, available evidence suggests that few hospitals that have closed were the sole source of care in rural communities (252) (see ch. 5). As of 1987, many more rural than urban community hospitals with fewer than 300 beds provided delivery services (85 v. 64 percent) (table 15-18). Smaller hospitals in rural areas are much more likely than comparable urban hospitals to offer delivery services. For example, of hospitals with fewer than 25 beds, less than one-third (29 percent) of the urban hospitals but more than three fourths (77 percent) of rural hospitals report deliveries (table 15-18). Of hospitals that perform deliveries, rural hospitals have fewer births per hospital than do urban hospitals of comparable size. In hospitals with 100 to 199 beds, for example, there are on the average 451 births per rural hospital, compared with 790 in urban hospitals (table 15-19).

Evidence suggests that many patients are migrating from rural areas to deliver their babies in more distant urban hospitals:

- A 1985 national health care consumer survey showed that almost one-half (47 percent) of rural residents were going to other areas for specialized care, such as women's services (303).
- In the North Central States between 1980 and 1987, there was a 20 percent decline in rural births per hospital and a 5 percent increase in births per hospital in urban hospitals (577).<sup>44</sup>
- In 1988, 50 percent of pregnant women residing in rural Alabama did not deliver at the nearest rural hospital providing obstetric services. Here, women traveled to deliver an average of 23 miles; over one-third went to hospitals in metro areas (102 b).

<sup>42</sup>Nutritional risk includes a history of poor pregnancy outcomes, iron-deficiency anemia, and inadequate dietary patterns.

<sup>43</sup>Areas with a population of fewer than 25,000 were defined as rural.

<sup>44</sup>Whether this shift occurred because of a lack of availability of delivery services, because high-risk pregnancies were increasingly being referred to urban centers, or because patients chose to deliver in urban areas is unknown. Births represented 10 percent of rural hospital admissions in 1987 and so the shift of births to urban areas could jeopardize the financial stability of rural hospitals (577).



**Table 15-18-Proportion of Community Hospitals<sup>a</sup> Reporting In-Hospital Births,<sup>b</sup> by Hospital Bed Size and Location, 1987**

Bed size	Metro		Nonmetro	
	Percent	(Total number of hospitals in bedsize category)	Percent	(Total number of hospitals in bedsize category)
Total hospitals . . . . .	64.3	(1, 957 )	85.4	(2, 584 )
6-24 . . . . .	29.0	(31)	77.0	(200 )
25-49 . . . . .	54.5	(143)	81.5	(817)
50-99 . . . . .	57.4	(427)	86.0	(893)
100-199 . . . . .	63.9	(756)	92.0	(539)
200-299 . . . . .	74.0	(600)	91.1	(135)

<sup>a</sup>Community hospitals defined here as short-stay, non-Federal, nonspecialty hospitals (see app. C).

<sup>b</sup>Hospitals reporting births are those reporting at least one birth.

SOURCE: Office of Technology Assessment, 1990. Data from the American Hospital Association's 1987 Annual Survey of Hospitals.

**Table 15-19--Average Number of Deliveries in Metropolitan and Nonmetropolitan Community Hospitals,<sup>a</sup> by Bed Size, 1987<sup>b</sup>**

Bed size	Average deliveries per hospital			
	Metro		Nonmetro	
	Average deliveries	(Number of hospitals)	Average deliveries	(Number of hospitals)
Total hospital . . . . .	831	(1,259)	257	(2,207)
6-24 . . . . .	137	(9)	46	(154)
25-49 . . . . .	183	(78)	96	(666)
50-99 . . . . .	367	(245)	223	(768)
100-199 . . . . .	790	(483)	451	(496)
200-299 . . . . .	1,261	(444)	818	(123)

<sup>a</sup>Community hospitals, defined here as short-stay, non-Federal, nonspecialty hospitals.

<sup>b</sup>Analysis is limited to those hospitals with fewer than 300 beds and reporting at least 1 birth.

SOURCE: Office of Technology Assessment, 1990. Data from the American Hospital Association's 1987 Annual Survey of Hospitals.

In 1986, One-third or more of obstetric patients in the service area of 25 of Washington's 33 rural hospitals<sup>45</sup> were having their babies in a hospital outside of their community. In some cases, patient outmigration occurred because a community hospital had stopped offering delivery services, but 28 of 33 hospitals were still offering obstetric services at the end of the study period (433).

Some reports link a decline in the number of physicians available to deliver babies to the closure of hospital obstetric units (336,591). It is difficult to determine whether the precipitating factor was that physicians stopped delivering babies or that patients left the local hospital to deliver elsewhere. In one

case study, for example, nearly one-half (45 percent) of women who resided in a rural hospital service area were driving over 50 miles to deliver even though the local hospital had physicians on staff. Women using the local hospital were more likely to be under 18 years old, unmarried, and not a high school graduate than women traveling outside of the area for care (591). That the number of deliveries per available physician declined before the physicians themselves began to drop obstetrics suggests that patient migration and a subsequently greater proportion of high-risk patients in their practices may have prompted some local physicians to drop the service (591).<sup>46</sup> In rural Alabama, evidence suggests that rural obstetric units close because women stop using

<sup>45</sup>Rural hospitals were defined as all acute-care, inpatient facilities of fewer than 50 beds and located more than 15 miles from a city of 30,000 population or greater (433).

<sup>46</sup>According to the case study, the physicians providing most of the care wanted to continue to provide obstetric services but could not afford the malpractice insurance (591).

Table 15-20-Mothers With Ultrasound and Electronic Fetal Monitoring During Pregnancy or Labor, 1980

Residence	Ultrasound during <sup>a</sup> pregnancy <sup>b</sup> Race			Electronic fetal monitoring during labor <sup>c</sup> Race		
	All races	White	Black	All races	White	Black
All locations. . . . .	29.3	29.1	30.6	47.2	47.1	47.6
Metro. . . . .	32.0	31.6	34.9	51.8	51.1	54.7
South . . . . .	31.1	31.7	29.8	50.4	49.6	53.4
Other regions . . . . .	32.4	31.6	38.6	52.3	51.6	55.6
-----						
Nonmetro. . . . .	24.2	24.5	19.0	38.8	40.2	29.3
South . . . . .	22.3	23.1	18.5	37.9	40.4	29.1
Other regions . . . . .	25.6	25.4	-- --	39.4	40.1	-- --

<sup>a</sup>Women with at least one ultrasound during pregnancy.

<sup>b</sup>Based on 5,343 births included in the National Natality Survey.

<sup>c</sup>Based on 7,504 births included in the National Natality Survey.

SOURCE: J.C. Kleinman, M. Cooke, S. Machlin et al., "Variation in Use of Obstetric Technology," *Health. U.S.* 1983 (PHS) 84-1232 (Bethesda, MD: December 1983).

them. Here, large numbers of women migrated from rural hospitals long before they stopped providing obstetric services (102b).

In contrast, a 40-bed hospital in Nevada progressed from providing only 7 to 73 percent of the county's deliveries through some deliberate steps aimed at winning back obstetric patients after a period of patient outmigration to urban hospitals (5(95). These steps included:

- attracting and organizing necessary personnel and implementing a team approach with obstetric morbidity and mortality conferences,
- providing equipment such as ultrasound machines and fetal monitors to improve care quality, and
- publicizing the availability of obstetric services.

Some women may choose to obtain prenatal care and deliver in more distant hospitals because of greater access to medical technologies. In 1980, pregnant women in rural areas were less likely than urban women to receive ultrasound or electronic fetal monitoring (table 15-20). Urban/rural differences were especially great for black women (322).

Communications technology is making it easier for rural providers to offer obstetric monitoring to their patients. Facsimile machines, for example, are used by some rural practitioners to transmit fetal

monitoring strips to perinatologists in a distant center for interpretation. If a problem is detected, a helicopter and support team are dispatched to transfer the mother to a regional center (132,259).

#### Access to Regional Systems of Perinatal Care

In the aggregate, events that may require specialized care occur relatively frequently. Twelve percent of women have at least one major complication of pregnancy, 11 percent of women have a major complication of labor, nearly 20 percent of deliveries occur by cesarean section (8),<sup>47</sup> and about 4 to 6 percent of newborns require neonatal intensive care (619). For individual rural practitioners with small obstetric practices, however, these occurrences are relatively infrequent. To assure access to care when complications arise, regional systems of perinatal<sup>48</sup> care have been organized in some areas so that low-risk patients are cared for by primary care practitioners in community hospitals and clinics while high-risk patients are selectively triaged (and sometimes transported) to providers and facilities equipped to provide specialized care. These perinatal centers are usually located in urban areas (549). In 1987, for example, fewer than 2 percent of rural hospitals and 6 percent of urban hospitals with fewer than 300 beds had a neonatal intensive care unit (NICU) (table 15-21). There are relatively fewer pediatricians in rural than urban areas to care for seriously ill newborns (table 15-10).

<sup>47</sup>In 1980, cesarean section births occurred slightly more frequently in urban (18 percent) than rural areas (16 percent) (9).

<sup>48</sup>Perinatal refers to the period shortly before and after birth; it is variously defined as beginning with the completion of the 20th to 28th week of gestation and ending 7 to 28 days after birth.

**Table 15-21-Proportion of Community Hospitals<sup>a</sup> With a Neonatal Intensive Care Unit, by Hospital Bed Size and Location, 1987**

Bed size	Metro (Total number of hospitals in bedsize category)		Nonmetro (Total number of hospitals in bedsize category)	
	Percent		Percent	
Total hospitals . . . . .	6.4	(1, 957 )	1.7	(2, 584 )
6-24. . . . .	0.0	(31)	0.0	(200)
25-49. . . . .	0.0	(143)	0.0	(817)
50-99. . . . .	.9	(427)	0.7	(893)
100-199. . . . .	4.6	(756)	4.3	(539)
200-299. . . . .	14.3	(600)	11.9	(135)

<sup>a</sup>Community hospitals, defined here as short-stay, non-Federal, nonspecialty hospitals. Analysis is limited to hospitals with fewer than 300 beds.

SOURCE: Office of Technology Assessment, 1990. Data from the American Hospital Associations 1987 Annual Survey of Hospitals.

In many areas, regionalization appears to be concentrating high-risk infants in facilities equipped to care for them (249,527). When physicians working in community hospitals refer a large number of high-risk obstetric patients, the need to transport sick neonates from these hospitals is lower. In Iowa, for example, 78 percent of very-low-birthweight births occur in specialized hospitals (249).<sup>49</sup> In other areas, a regionalized approach to perinatal care has not yet fully evolved. In upstate New York, for example, many high-risk babies are still being delivered in small rural hospitals (155). A 1988 study found that regionalized perinatal care systems have generally deteriorated over the last several years. The study indicated that in some areas competition has replaced cooperation among hospitals providing perinatal care (425). Furthermore, many community hospitals are upgrading their neonatal programs, regardless of whether the number of high-risk infants is sufficient to maintain either professional skill levels or program economic viability (248,425).

There will always be a number of presumed "low-risk" deliveries that have unanticipated complications, so rural hospitals that offer obstetric services must maintain the capability to perform emergency procedures such as cesarean sections, which involve surgical, anesthetic, and post-operative capability (402). Alternatively, rural hos-

pitals can utilize transfer agreements and rapid transportation systems to facilitate access to specialized obstetric units and NICUs.

## MODEL RURAL MATERNAL AND INFANT SERVICE PROGRAMS

Several components of health care programs have been identified as contributing to declines in infant mortality in rural areas:<sup>50</sup>

- placement of publicly supported obstetric providers in the community (e.g., physicians, CNMs, or nurse practitioners),
- the availability of obstetricians either locally or on a consultant basis,
- the provision of obstetric services for low-risk patients by public health nurses with support from local physicians,
- the presence of perinatal transport systems and training,
- high WIC utilization,
- implementation of tracking and management systems,
- program flexibility and a lack of strict program boundaries,
- interagency coordination and cooperation, and
- community concern and leadership (465).

Demonstration programs funded privately and through the Federal Government have attempted to

<sup>49</sup>Specialized hospitals include level two and three centers. Before the regionalized system was developed, these infants were just as likely to be born in a level one hospital where resources needed to care for these infants may not have been available (249).

<sup>50</sup>The Bureau of Health Care Delivery and Assistance funded a study to identify factors that have contributed to decreasing infant mortality rates in rural counties over the past 15 years. The National Rural Health Association selected four communities to study in Louisiana, Texas, Montana, and South Carolina with populations between 10,000 and 35,000 (465).

redress problems of access to care and high infant mortality in rural areas. In addition, many States have initiated innovative programs to improve perinatal outcomes.

The Rural Infant Care Program,<sup>51</sup> funded from 1980 to 1984 by the Robert Wood Johnson Foundation, was designed to give poor rural families access to regional networks of perinatal care by linking their local public health units, physicians, and hospitals with tertiary medical centers (517).<sup>52</sup> An evaluation of the program showed that infant mortality declined in the target populations and among high-risk groups (223). Among the program components that were included were:

- screening for high-risk pregnancies and providing followup to those identified in special clinics;
- implementing health education and nutrition programs;
- establishing neonatal hotlines so that local providers could obtain medical consultation;
- implementing a system for transporting high-risk women in labor and newborn infants to hospitals with NICUs;
- using CNMs, nurse educators, and pediatric nurse practitioners to supplement physician care;
- conducting in-service education programs for local providers; and
- training and employing lay outreach workers for patient recruitment, follow-up, and transportation to the clinic or hospital for care.

Federal programs implemented in the mid-1970s contributed to declines in infant mortality by facilitating the development and use of perinatal centers (215). From 1976 to 1979, 32 States plus the District of Columbia and Puerto Rico were funded through The Improved Pregnancy Outcome (IPO) Program<sup>53</sup> to undertake the following activities (215):

- perform needs assessments for the provision of perinatal services;
- write State perinatal health care plans;
- define levels of perinatal care;
- educate providers of health care;

- establish systems for perinatal data analysis, including the matching of birth and death certificates;
- monitor and establish mechanisms for improving quality of care for pregnant women and newborns, including the creation of maternal and perinatal mortality committees; and
- organize the flow of patients so that those with the highest risk of a poor outcome could be cared for in appropriate perinatal centers.

Through the Federal Improved Child Health Program (ICHP), 8 States were awarded 5-year grants to assist targeted counties in improving infant mortality (579). Evaluations of some of the projects located in rural areas show that they were effective in increasing prenatal care use but unsuccessful in changing the incidence of low-birthweight (468, 579).

The MCH block grant program funds service demonstration projects, State staff development programs, and other initiatives to help States develop their MCH programs (66). In 1989, for example, 24 ongoing projects specifically related to rural maternal and infant health care were funded through the grant program (687). Among the funded projects were those supporting health promotion in rural black communities and consultation visits to high-risk pregnant women in rural clinics by a team of perinatal specialists (687).

In some rural areas, adverse overall economic conditions may overshadow the effects of special health care interventions. A program implemented in an impoverished rural area in Appalachia<sup>54</sup> failed to improve neonatal mortality despite the operation of free hospital- and community-based clinics and the provision of home health visits by outreach workers (515). Despite the Indian Health Service's regionalized system of perinatal care, which includes nurse-midwives performing low-risk deliveries and trained indigenous workers providing home-based care, infant mortality is 11/2 times higher among Native Americans than among all U.S. residents (616).

<sup>51</sup>The Rural Infant Care Program is also briefly described in app. E.

<sup>52</sup>Ten medical schools in nine States were funded (517).

<sup>53</sup>States and not the Federal Government selected locations of services to be provided under the grant (215).

<sup>54</sup>The Family Health Services program in Eastern Kentucky was funded by the Robert Wood Johnson Foundation and operated from 1974 to 1978 (515).

Innovative programs may be difficult to administer in rural areas without a flexible approach. In California, for example, rural implementation of the Comprehensive Perinatal Service Program,<sup>55</sup> which provides risk assessments, prenatal services, case coordination, and perinatal and parenting education, has been handicapped by strict program requirements for support staff. Several rural counties do not have the trained health educators, social workers, and registered dietitians that are required to administer the program (133).

## SUMMARY AND CONCLUSIONS

***Fetal, infant, and maternal mortality are disproportionately high in rural areas. The*** fact that rural women are less likely than urban women to receive early prenatal care probably contributes to the relatively high perinatal death ratios in rural areas. Sharp declines in the availability of rural obstetric providers, leaving none in some areas, are exacerbating access problems. ***Over half a million rural residents live in counties that are without a physician trained to deliver obstetric care.*** There are fewer obstetricians available in rural than urban areas, but G/FPs who provide obstetric services partially compensate for this deficiency. The presence of physicians trained to provide obstetric services varies widely by region. Southern States appear to have the fewest trained providers, and over 250,000 residents of 53 Southern counties are without obstetric providers.

In many areas, physicians trained to provide obstetric services are not doing so. ***Surveys of FPs, who are the primary source of obstetric care in rural areas, show that rural FPs are almost twice as likely to be delivering babies as their urban counterparts and are providing a wider range of obstetric services.*** Nevertheless, while over 40 percent of rural FPs are providing routine obstetric care nationally, fewer than 20 percent are providing routine care in some rural areas of the South.

Several factors may contribute to a rural physician's decision not to practice obstetrics. There may not be adequate coverage for time off, consultation may be unavailable, and referrals to larger hospitals may be difficult to make. ***A number of States report that a large proportion of physicians are eliminating or limiting their obstetric practices as a direct***

***consequence of the high cost of malpractice insurance and fears of lawsuits. It is more difficult for rural providers with small obstetric practices to pay for malpractice premiums, because insurance rates often do not consider practice volume. Rural FPs*** not providing obstetric care are much more likely than their urban counterparts to cite costs of liability insurance as a deterrent. ***Based on analyses of AAFP survey data, there could be a significant increase in the availability of FPs providing obstetric care in rural areas if malpractice insurance premium costs declined.*** Two-thirds of C/MHCs, important providers of obstetric care in many rural areas, also report that medical malpractice problems have affected their ability to furnish obstetric services.

Uncertain is whether low obstetric provider participation in the Medicaid program is more of a problem in rural than in urban areas. Representatives of MCH block-grant-funded and Medicaid programs report particular problems with low physician participation in rural areas, and yet obstetric provider and consumer surveys suggest that rural obstetric providers are more likely to be participating. Nevertheless, one survey of uninsured and Medicaid-insured women showed that as many as 8 percent of women delivering babies in rural hospitals could not get a doctor, midwife, or nurse to see them for prenatal care.

Although CNMs are important potential providers of rural obstetric services, they are few in number and the majority are located in urban areas. ***An inability to obtain malpractice insurance or physician backup, and in some cases, State practice laws have prevented nonphysician obstetric providers from practicing in rural areas.***

Hospitals in rural areas are much more likely to offer delivery services than urban hospitals of similar size. However, evidence suggests that in some rural areas women travel great distances to deliver their babies in hospitals outside their own communities. These patients may be attracted to obstetric services such as birthing rooms and sophisticated perinatal services and technologies. When patient outmigration occurs, it is the well-insured, higher income, and well-educated patient who leaves the local community for care, leaving behind the uninsured and Medicaid patients. Rural provid-

<sup>55</sup>The Comprehensive Perinatal Service program is cosponsored by the Medicaid program and the State's Maternal and Child Health Branch.

ers left to care for these patients may find it difficult to maintain a practice or to afford liability coverage. There may also be an erosion of public confidence in local rural hospitals that may not have the capital to invest in up-to-date obstetric equipment. Without technological support, some providers may drop obstetric services, considering them too risky. Some rural hospitals experiencing patient outmigration for obstetric services have successfully reversed this trend by reorganizing the existing obstetric service, upgrading equipment, and advertising available services. New communications technologies, such as facsimile machines, are improving rural obstetric providers' rapid access to obstetric monitoring services.

Although rural hospitals are much more likely than urban hospitals to offer obstetric care, they are much less likely to offer specialized care. ***Regionalized perinatal care helps to ensure that rural residents have access to specialized care when obstetric or neonatal emergencies arise, but there is evidence that regionalized systems of care have deteriorated over the past several years.*** Past Federal grant programs were successful in promoting the development of regionalized systems of perinatal care.

States are quite dependent on Federal resources to provide maternal and child health services. In 1987, nearly three-fourths (73 percent) of States' maternal and child health expenditures derived from Federal sources (496). ***Federal programs such as Medicaid, the MCH block grant program, and C/MHCs are especially important in rural areas since rural women are relatively less likely to have medical insurance that covers pregnancy expenses. The inability to pay for obstetric services is a serious problem in rural areas—in 1982, rural deliveries accounted for nearly one-half of all uncompensated deliveries.***

Government or privately funded programs have successfully reduced infant mortality in targeted rural areas. Components of these programs that are felt to have contributed to their success include publicly supported obstetric providers, midlevel practitioners, perinatal transportation systems, inter-agency coordination, and outreach workers that recruit patients and provide followup and transportation.