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ASSESSMENT OF THE AVAILABILITY OF MAMMOGRAPHY SERVICES

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Final Report

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Assessment of the Availability of Mammography Services

Recent news reports have suggested that closures and service curtailments by mammography providers have made it more difficult for women to schedule and obtain mammograms within a reasonable length of time.[1] The possible shortage of mammography services has raised concerns that some women are not receiving needed mammograms due to limitations in access. To examine the issue of mammography access, ERG first reviewed data provided by FDA describing changes in the numbers and distribution of mammography facilities. ERG then compared these data with statistics on the number of women in age groups for which annual mammograms are recommended and with estimates of changes in the prevalence of women receiving mammograms. This analysis provides an overview of the availability of mammography services and of the changes in the demand for and supply of mammograms in recent years.

Mammography Facilities

FDA's database of mammography facilities shows 9,512 certified domestic operations as of June 2001.[2] By comparison, there were 9,558 certified facilities (46 more) on January 1, 2000, and 9,314 such facilities (198 fewer) on January 1, 1999. Fewer certified facilities are currently operating than were open in either 1997 or 1994. According to mammography facility databases previously provided to ERG, an estimated 10,119 and 9,956 facilities were open in 1994 and

[1]See, for example, "Need a mammogram? It could take a while: Delays reach crisis levels as women wait up to five months for a routine screening," *Time Magazine*, March 12, 2001; "Experts foresee crisis in access to breast tests," *New York Times*, November 30, 2000; and "As more women seek mammograms, many have to wait months, low payments from insurers, influx of patients put breast clinics in a bind," *Wall Street Journal*, October 30, 2000.

[2]This count excludes mammography facilities in Puerto Rico and other overseas locations and federal facilities operated by the Department of Veterans Affairs.

1997, respectively.[3] These statistics show that nationally the number of mammography facilities has declined by 4.5 percent since 1997 and 6.0 percent since 1994.[4]

Table 1 shows the distribution of mammography facilities by state and by year, while Table 2 shows the percentage changes by state from 1994 and 1997 to the present. Although the total number of facilities declined during the late 1990s, 19 states experienced a growth in mammography operations, accounting for 116 additional facilities since 1997. Thirty-one states (including the District of Columbia) lost a total of 560 facilities since 1997. (Facilities were unchanged in one state.) Facility closures were most pronounced in several New England states (Connecticut, Massachusetts, and Rhode Island) and in New Mexico, California, Maryland, and the District of Columbia. Since 1997, these states have experienced declines in facilities that range from 11.3 to 25.0 percent.

In addition to the reduction in facilities, the number of facilities per 10,000 females 40 years of age or over has also declined in most states. Table 3 presents estimates of these facility-population ratios for 1999 and 1997, based on population data from the U.S. Bureau of the Census. (Census data released thus far are not sufficiently detailed to allow the calculation of the

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[3]These statistics are based on Mammography Program Reporting and Information System facility databases dated December 15, 1994, and March 19, 1997. See Eastern Research Group, Economic Impact Analysis of Regulations Under the Mammography Quality Standards Act of 1992, Appendix E: Analysis of Newly Closed and Newly Opened Mammography Facilities.
Prepared for the U.S. FDA, Office of Planning and Evaluation. Task Order No.1, Contract No. 223-94-8031. October 7, 1997.

[4]Recent FDA analyses of the mammography facility database have found that the 1994 facility counts were inflated due to duplicate listings of facilities that had received more than one accreditation. Thus the 1994 count overstates the true number of facilities that were operating at that time. Those facilities with duplicate records were located in California and Iowa. Personal communication with Tim Haran, Chief, Information Management Branch, Division of Mammography Quality and Radiation Programs, Office of Health and Industry Programs
Center for Devices and Radiological Health, Food and Drug Administration. October 10, 2001.

ratios for the year 2000.) In 1999, the median for all states was 1.57 facilities per 10,000 women, a decline of 9.2 percent from 1997. Among states, the 1999 ratio ranged from 3.03 in Alaska to 1.23 in California. Only five states experienced an increase in the facility/population ratio between 1997 and 1999.

Demand for Mammography Services

The actual demand for mammography services depends on the number of females who are referred for or seek screening or diagnostic mammograms. The FDA mammography facility database contains information on the number of procedures performed by each facility. These statistics, however, are based on submittals by facilities at the time of their accreditation. They may, therefore, underestimate the current level of services if demand is increasing over time. Surveys conducted by the Centers for Disease Control and Prevention (CDC) provide an alternative source for estimates of the number of mammograms provided by mammography facilities. CDC's Behavioral Risk Factor Surveillance Survey (BRFSS), conducted annually, collects information on the prevalence of females who seek clinical breast exams and receive mammograms. ERG used the results from the 1997 and 2000 BRFSS to tabulate, by state, the number of females 40 years of age and older who had a mammogram in the last 12 months. These statistics were then divided by the number of facilities to derive a measure of the average number of mammograms per facility provided in each state.

Table 4 shows the estimated number of mammograms provided in each state and the corresponding ratio of mammograms to facilities. Overall, 19.0 percent (the overall median) more women over 40 years of age received mammograms in 2000 than in 1997. During the same period, the estimated number of mammograms per facility increased by 20.9 percent. Only two states (Alaska and Wyoming) showed a decline in the number of mammograms per facility. These results clearly indicate that mammography facilities met increased demand for services without a corresponding increase in the number of facilities. During this period, mammography providers either had excess capacity or expanded capacity in the face of increased demand.

Additional tabulations from the CDC's surveys provide insights about the level of demand for mammography services. Table 5 shows the estimates of the percentage of females 40 years and older that had a mammogram in the previous 12 months. In 1997, the median for all states was 29.9 percent for women 40 to 49 years old and 57.0 percent for women 50 years old and older. By 2000, these percentages had increased to 36.3 percent for the younger age group and 64.7 percent for older women. Among individual states, the increase in the percentage of women over 40 receiving mammograms in the previous 12 months ranged from 1.9 percentage points (Georgia) to 23.0 percentage points (Arizona). The median increase was 7.7 points. Thus, despite the decline in the number of facilities over the 1997 to 2000 period and the increase in the number of women in the over-40 age group, an increasing percentage (and number) of women are receiving mammograms each year.

Statistical tests show virtually no correlation between the percentage change in facilities and the change in the percentage of women receiving mammograms in the previous 12 months. When states are ranked first by the percentage change in those receiving mammograms and then by the percentage change in facilities, the resultant Spearman rank-order correlation coefficient is 0.034, where 1.0 indicates perfect rank-order correlation.[5] In fact, the only statistically significant correlations observed for the change in the percentage receiving mammograms were negative relationships with (1) the percentage receiving mammograms in 1997 and (2) the population change between 1997 and 1999. Thus, states with higher rates of women receiving mammograms in 1997 and with higher population growth rates were more likely to have smaller increases in the percentage of women getting mammograms. Table 6 shows these correlation statistics.

[5]With 51 observations, a correlation coefficient of about 0.29 is necessary to reject, at the 95-percent confidence level, the hypothesis that the two variables are unrelated.

Mammography Access

The CDC surveys do not directly address the question of whether delays in scheduling negatively affect the numbers of women seeking mammograms. The surveys do, however, contain information about whether women have had clinical breast exams in the previous 12 months. By combining these responses with responses about whether the respondent had a mammogram in the previous 12 months, we can construct estimates of the percentages of those women who had a clinical exam in the last year and received a mammogram in the same period. Since a breast exam is often a precondition for seeking a mammogram, this statistic comes closer to addressing the question of whether women do not obtain mammograms because of difficulties in scheduling or because of poor access to mammography services.[6]

Table 7 shows these statistics by state for 1997 and 2000. Based on the median across all states, 66.1 percent of women 40 and older in 1997 who had a clinical breast exam also received a mammogram in the last 12 months. The median was 77.8 percent for women 50 and older and 43.0 percent for women 40 to 49. By 2000, these percentages had increased to 84.9 percent for the older women and 49.1 percent for the younger group, with an overall median of 74.1 percent. In 2000, therefore, only 15.1 percent of older women who had a breast exam failed to receive a mammogram, an absolute decrease of 7.1 percentage points from 1997. Among states, the percentages receiving mammograms ranged from 77.2 percent to 91.4 percent for women 50 and over and from 36.0 to 63.9 percent for women 40 to 49. Thus, despite the decline in facilities in most states, the percentage of women with clinical breast exams who also received mammograms in the same year increased by between 2.0 and 15.7 percentage points, with a median increase of 6.8 points.

[6]Some women may “self refer” themselves for a mammogram.

Summary

In summary, the data from the FDA mammography database, in combination with population data, show that the number of mammography facilities has declined in most states while the population of potential recipients of mammography services has increased. This suggests an increased demand relative to the supply of mammography services. The number of facilities by itself, however, does not capture the effective capacity of mammography providers. Data from the CDC surveys, when combined with the FDA data, show that providers conducted substantially more mammograms per facility in 2000 than they did in 1997. Other CDC survey data describing the prevalence of women who receive clinical breast exams and mammograms show that an increasing percentage of women in the 40 and older age group have recently obtained a mammogram. Furthermore, when only women receiving clinical breast exams are considered, an increased percentage received a mammogram in the same year. The CDC data thus fail to support claims that closures of mammography facilities or increased demand for mammography services have negatively affected the number of women obtaining mammograms. This analysis, however, has examined only the period 1997 through 2000. Recent changes in the availability of mammography services might have had impacts not observable from these data. A recently released survey of mammography providers, however, supports the findings presented here. This survey of more than 9,900 mammography facilities found that the typical lead time to schedule a screening mammogram is longer than a week for 34 percent of facilities, but longer than a month for only 8 percent of facilities.[7] The survey findings suggest that any problems with mammography access are localized in nature rather than widespread.

[7]Survey of 9.908 mammography facilities conducted in 2000 by IMV Medical Information Division, Inc. A summary of the survey is available at www.imvlimited.com/mid/news_c.html. Accessed July 25, 2001.

Table 1

Number of Mammography Facilities by State and Year

State	Currently Operating	Operating 1/1/01	Operating 1/1/00	Operating 1/1/99	Operating 1997	Operating 1994
Alabama	159	161	157	151	161	159
Alaska	33	33	33	32	30	29
Arizona	151	157	157	155	163	161
Arkansas	113	109	105	101	110	109
California	794	825	828	833	959	1091
Colorado	115	116	112	112	117	123
Connecticut	158	162	166	168	182	180
Delaware	27	27	26	26	27	28
District of Columbia	24	24	25	26	32	34
Florida	503	524	506	488	539	563
Georgia	268	268	270	269	290	289
Hawaii	41	42	42	41	44	43
Idaho	48	48	45	43	44	41
Illinois	424	441	435	420	443	438
Indiana	231	231	230	219	234	227
Iowa	149	147	148	143	142	142
Kansas	136	137	137	123	137	144
Kentucky	174	173	175	170	165	170
Louisiana	170	173	164	151	163	162
Maine	63	62	57	55	57	56
Maryland	157	156	159	165	195	198
Massachusetts	205	205	209	218	231	224
Michigan	339	344	341	350	356	369
Minnesota	210	212	206	197	198	190
Mississippi	106	102	98	100	99	101
Missouri	187	192	199	194	206	213
Montana	50	48	46	45	52	50
Nebraska	93	92	90	88	88	83
Nevada	61	57	54	51	62	62
New Hampshire	49	49	48	44	47	49
New Jersey	283	290	292	282	290	291

Table 1 (cont.)

Number of Mammography Facilities by State and Year

State	Currently Operating	Operating 1/1/01	Operating 1/1/00	Operating 1/1/99	Operating 1997	Operating 1994
New Mexico	48	48	50	48	56	57
New York	710	712	709	688	748	763
North Carolina	253	253	251	242	246	242
North Dakota	42	44	41	38	40	42
Ohio	445	455	456	455	467	451
Oklahoma	105	106	106	103	111	114
Oregon	98	98	99	99	102	104
Pennsylvania	447	450	453	436	488	507
Rhode Island	47	49	50	50	53	50
South Carolina	126	132	134	119	121	121
South Dakota	49	48	47	46	45	41
Tennessee	211	212	210	196	200	195
Texas	583	581	565	549	585	575
Utah	47	48	48	43	48	49
Vermont	19	19	18	18	18	17
Virginia	214	216	221	213	226	239
Washington	181	187	188	178	189	189
West Virginia	85	87	85	83	90	87
Wisconsin	253	252	240	225	236	233
Wyoming	28	28	27	25	24	24
Total	9,512	9,632	9,558	9,314	9,956	10,119

Source: FDA Mammography Facility Database.

Table 2

Percentage Change in Number of Mammography Facilities, by State

State	1997 to Present	1994 to Present
Alabama	-1.2%	0.0%
Alaska	10.0%	13.8%
Arizona	-7.4%	-6.2%
Arkansas	2.7%	3.7%
California	-17.2%	-27.2%
Colorado	-1.7%	-6.5%
Connecticut	-13.2%	-12.2%
Delaware	0.0%	-3.6%
District of Columbia	-25.0%	-29.4%
Florida	-6.7%	-10.7%
Georgia	-7.6%	-7.3%
Hawaii	-6.8%	-4.7%
Idaho	9.1%	17.1%
Illinois	-4.3%	-3.2%
Indiana	-1.3%	1.8%
Iowa	4.9%	4.9%
Kansas	-0.7%	-5.6%
Kentucky	5.5%	2.4%
Louisiana	4.3%	4.9%
Maine	10.5%	12.5%
Maryland	-19.5%	-20.7%
Massachusetts	-11.3%	-8.5%
Michigan	-4.8%	-8.1%
Minnesota	6.1%	10.5%
Mississippi	7.1%	5.0%
Missouri	-9.2%	-12.2%
Montana	-3.8%	0.0%
Nebraska	5.7%	12.0%
Nevada	-1.6%	-1.6%
New Hampshire	4.3%	0.0%
New Jersey	-2.4%	-2.7%
New Mexico	-14.3%	-15.8%
New York	-5.1%	-6.9%

Table 2 (cont.)

Percentage Change in Number of Mammography Facilities, by State

State	1997 to Present	1994 to Present
North Carolina	2.8%	4.5%
North Dakota	5.0%	0.0%
Ohio	-4.7%	-1.3%
Oklahoma	-5.4%	-7.9%
Oregon	-3.9%	-5.8%
Pennsylvania	-8.4%	-11.8%
Rhode Island	-11.3%	-6.0%
South Carolina	4.1%	4.1%
South Dakota	8.9%	19.5%
Tennessee	5.5%	8.2%
Texas	-0.3%	1.4%
Utah	-2.1%	-4.1%
Vermont	5.6%	11.8%
Virginia	-5.3%	-10.5%
Washington	-4.2%	-4.2%
West Virginia	-5.6%	-2.3%
Wisconsin	7.2%	8.6%
Wyoming	16.7%	16.7%
Median, all states	-1.7%	-2.3%

Source: FDA Mammography Facility Database.

Table 3

Number of Facilities per 10,000 Women, 40 Years of Age and Over, by State: 1999 and 1997

State	1997	1999[a]	Change 1997-1999
Alabama	1.61	1.48	-7.6%
Alaska	2.94	3.03	3.1%
Arizona	1.66	1.49	-10.2%
Arkansas	1.86	1.70	-8.8%
California	1.50	1.23	-18.0%
Colorado	1.39	1.24	-10.7%
Connecticut	2.34	2.11	-9.8%
Delaware	1.65	1.51	-8.5%
District of Columbia	2.49	1.92	-22.7%
Florida	1.45	1.28	-12.1%
Georgia	1.87	1.64	-12.4%
Hawaii	1.67	1.50	-10.1%
Idaho	1.77	1.67	-5.8%
Illinois	1.67	1.56	-6.5%
Indiana	1.77	1.65	-7.0%
Iowa	2.09	2.09	0.1%
Kansas	2.34	2.16	-7.9%
Kentucky	1.85	1.86	0.5%
Louisiana	1.73	1.61	-6.5%
Maine	1.93	1.83	-4.9%
Maryland	1.74	1.40	-20.0%
Massachusetts	1.62	1.45	-10.5%
Michigan	1.64	1.54	-5.9%
Minnesota	1.95	1.90	-2.5%
Mississippi	1.66	1.60	-3.6%
Missouri	1.66	1.53	-7.5%
Montana	2.54	2.14	-15.6%
Nebraska	2.37	2.33	-1.4%
Nevada	1.79	1.38	-22.9%
New Hampshire	1.86	1.74	-6.6%
New Jersey	1.53	1.46	-4.3%
New Mexico	1.55	1.30	-16.3%
New York	1.77	1.61	-8.9%

Table 3 (cont.)

Number of Facilities per 10,000 Women, 40 Years of Age and Over, by State: 1999 and 1997

State	1997	1999[a]	Change 1997-1999
North Carolina	1.46	1.39	-4.6%
North Dakota	2.78	2.69	-3.3%
Ohio	1.80	1.71	-4.9%
Oklahoma	1.46	1.33	-9.1%
Oregon	1.35	1.26	-6.7%
Pennsylvania	1.63	1.46	-10.7%
Rhode Island	2.26	2.08	-7.8%
South Carolina	1.42	1.41	-0.6%
South Dakota	2.78	2.79	0.4%
Tennessee	1.60	1.57	-2.4%
Texas	1.51	1.35	-10.6%
Utah	1.40	1.27	-9.6%
Vermont	1.34	1.29	-4.1%
Virginia	1.54	1.42	-7.9%
Washington	1.57	1.45	-7.7%
West Virginia	1.95	1.78	-8.5%
Wisconsin	2.03	1.94	-4.7%
Wyoming	2.31	2.40	4.1%
Median, all states	1.73	1.57	-9.2%
Maximum	2.94	3.03	4.1%
Minimum	1.34	1.23	-22.9%

Source: FDA Mammography Facility Database; U.S. Bureau of the Census population estimates. Detailed population estimates not available for 2000.

[a] Based on the average number of facilities open during 1999.

Table 4

Mammograms by State: 2000 and 1997

State	Number of Mammograms			Mammograms per Facility		
	1997	2000	Change 1997-2000	1997	2000[a]	Change 1997-2000
Alaska	71,329	77,561	8.7%	443	488	10.1%
Alabama	656,797	685,987	4.4%	21,893	20,787	-5.1%
Arizona	520,294	870,851	67.4%	3,192	5,547	73.8%
Arkansas	289,701	403,036	39.1%	2,634	3,767	43.0%
California	4,219,730	4,894,071	16.0%	4,400	5,921	34.6%
Colorado	513,556	603,597	17.5%	4,389	5,295	20.6%
Connecticut	523,607	648,065	23.8%	2,877	3,952	37.4%
District of Columbia	89,561	100,007	11.7%	3,317	3,774	13.8%
Delaware	120,393	151,500	25.8%	3,762	6,184	64.4%
Florida	2,654,245	2,947,370	11.0%	4,924	5,723	16.2%
Georgia	1,084,512	1,221,901	12.7%	3,740	4,542	21.5%
Hawaii	179,940	199,975	11.1%	4,090	4,761	16.4%
Iowa	371,219	473,081	27.4%	8,437	10,174	20.6%
Idaho	128,210	151,677	18.3%	289	346	19.7%
Illinois	1,661,097	2,014,576	21.3%	7,099	8,740	23.1%
Indiana	780,326	947,962	21.5%	5,495	6,427	17.0%
Kansas	360,660	422,202	17.1%	2,633	3,082	17.1%
Kentucky	563,798	671,122	19.0%	3,417	3,857	12.9%
Louisiana	623,675	736,965	18.2%	3,826	4,374	14.3%
Massachusetts	1,030,159	1,210,546	17.5%	18,073	20,345	12.6%
Maryland	850,915	942,654	10.8%	4,364	5,985	37.2%
Maine	190,348	218,709	14.9%	824	1,057	28.2%
Michigan	1,490,070	1,775,562	19.2%	4,186	5,184	23.9%

Table 4 (cont.)

Mammograms by State: 2000 and 1997

State	Number of Mammograms			Mammograms per Facility		
	1997	2000	Change 1997-2000	1997	2000[a]	Change 1997-2000
Minnesota	606,215	737,089	21.6%	3,062	3,527	15.2%
Missouri	712,248	901,631	26.6%	7,194	9,016	25.3%
Mississippi	329,960	376,079	14.0%	1,602	1,924	20.1%
Montana	111,030	137,630	24.0%	2,135	2,928	37.1%
North Carolina	1,123,628	1,371,983	22.1%	12,769	15,077	18.1%
North Dakota	87,497	95,217	8.8%	1,411	1,716	21.6%
Nebraska	205,249	268,880	31.0%	4,367	5,544	27.0%
New Hampshire	171,582	201,095	17.2%	592	691	16.8%
New Jersey	1,262,470	1,514,622	20.0%	22,544	30,911	37.1%
New Mexico	202,157	248,780	23.1%	270	350	29.6%
Nevada	218,622	292,841	33.9%	889	1,162	30.8%
New York	3,006,550	3,384,130	12.6%	75,164	79,627	5.9%
Ohio	1,644,999	1,963,561	19.4%	3,522	4,311	22.4%
Oklahoma	410,138	496,664	21.1%	3,695	4,686	26.8%
Oregon	467,291	536,200	14.7%	4,581	5,444	18.8%
Pennsylvania	1,870,454	2,159,221	15.4%	3,833	4,782	24.8%
Rhode Island	161,944	200,637	23.9%	3,056	4,053	32.7%
South Carolina	474,666	671,933	41.6%	3,923	5,052	28.8%
South Dakota	99,862	113,612	13.8%	2,219	2,392	7.8%
Tennessee	822,266	942,073	14.6%	4,111	4,465	8.6%
Texas	2,306,786	2,901,529	25.8%	3,943	5,064	28.4%
Utah	198,028	235,049	18.7%	4,126	4,897	18.7%
Virginia	920,460	1,115,348	21.2%	51,137	60,289	17.9%

Table 4 (cont.)

Mammograms by State: 2000 and 1997

State	Number of Mammograms			Mammograms per Facility		
	1997	2000	Change 1997-2000	1997	2000[a]	Change 1997-2000
Vermont	74,411	93,402	25.5%	329	427	29.8%
Washington	722,013	850,678	17.8%	3,820	4,537	18.8%
Wisconsin	650,724	832,968	28.0%	7,230	9,686	34.0%
West Virginia	257,001	323,929	26.0%	1,089	1,317	20.9%
Wyoming	58,501	63,733	8.9%	2,438	2,318	-4.9%
Median, all states	513,556	648,065	19.0%	3,820	4,686	20.9%

Source: CDC, Behavioral Risk Factor Surveillance Survey, 1997 and 2000; FDA Mammography Facility Database.

[a] Based on the average number of facilities open during 2000.

Table 5

Percentage of Women Receiving a Mammogram in the Previous 12 Months, by Age: 1997 and 2000

State	1997			2000			Change, 1997 to 2000		
	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over
Alabama	35.7%	54.8%	49.3%	31.7%	61.2%	52.9%	-4.0%	6.4%	3.6%
Alaska	28.4%	66.4%	50.2%	32.0%	66.8%	53.2%	3.7%	0.5%	3.1%
Arizona	31.7%	44.1%	40.4%	45.9%	70.5%	63.4%	14.2%	26.4%	23.0%
Arkansas	28.3%	41.4%	37.9%	34.4%	59.7%	53.1%	6.1%	18.3%	15.3%
California	29.0%	60.1%	49.7%	30.0%	65.6%	54.1%	1.0%	5.5%	4.4%
Colorado	33.5%	57.8%	49.3%	29.2%	63.9%	52.5%	-4.2%	6.2%	3.1%
Connecticut	32.7%	61.7%	52.9%	43.6%	74.6%	65.5%	10.9%	13.0%	12.6%
Delaware	38.8%	64.6%	56.8%	41.9%	77.0%	66.8%	3.0%	12.5%	10.0%
District of Columbia	33.4%	62.0%	53.2%	48.2%	65.1%	59.9%	14.8%	3.1%	6.8%
Florida	33.4%	66.2%	57.7%	37.0%	68.4%	60.4%	3.6%	2.3%	2.6%
Georgia	36.9%	58.6%	51.5%	34.1%	62.3%	53.4%	-2.9%	3.8%	1.9%
Hawaii	36.7%	62.7%	54.6%	41.6%	67.7%	60.0%	5.0%	4.9%	5.4%
Idaho	19.2%	50.2%	40.6%	23.5%	54.4%	45.5%	4.3%	4.1%	4.8%
Illinois	28.5%	57.6%	48.8%	40.8%	64.7%	57.6%	12.3%	7.0%	8.8%
Indiana	35.2%	52.1%	47.1%	36.8%	62.8%	55.4%	1.6%	10.7%	8.2%
Iowa	29.9%	49.2%	43.9%	34.5%	64.4%	56.6%	4.6%	15.2%	12.7%
Kansas	33.7%	55.8%	49.2%	35.6%	63.6%	55.5%	1.9%	7.7%	6.3%
Kentucky	32.9%	55.5%	48.8%	38.5%	64.3%	56.9%	5.5%	8.8%	8.1%
Louisiana	32.2%	57.0%	49.3%	44.4%	66.2%	59.7%	12.2%	9.2%	10.4%
Maine	26.5%	63.7%	52.5%	36.3%	69.9%	60.2%	9.8%	6.2%	7.7%
Maryland	35.7%	69.8%	58.6%	39.0%	72.3%	61.8%	3.3%	2.6%	3.2%
Massachusetts	39.1%	65.5%	57.4%	43.8%	73.6%	64.8%	4.6%	8.1%	7.4%

Table 5 (cont.)

Percentage of Women Receiving a Mammogram in the Previous 12 Months, by Age: 1997 and 2000

State	1997			2000			Change, 1997 to 2000		
	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over
Michigan	34.9%	63.3%	54.5%	42.7%	71.2%	62.9%	7.9%	8.0%	8.4%
Minnesota	25.9%	57.3%	47.6%	37.8%	62.4%	55.1%	11.9%	5.1%	7.5%
Mississippi	29.0%	48.0%	42.4%	28.0%	53.3%	46.0%	-1.0%	5.2%	3.6%
Missouri	25.0%	53.1%	45.1%	34.8%	63.1%	55.2%	9.7%	10.0%	10.1%
Montana	29.3%	51.2%	44.5%	30.7%	64.6%	54.9%	1.4%	13.4%	10.4%
Nebraska	26.9%	51.2%	44.1%	40.1%	61.6%	55.5%	13.2%	10.3%	11.3%
Nevada	22.5%	55.0%	44.8%	28.6%	64.5%	53.5%	6.1%	9.5%	8.8%
New Hampshire	37.0%	63.2%	54.7%	42.5%	67.3%	59.5%	5.5%	4.0%	4.9%
New Jersey	37.1%	56.3%	50.5%	41.0%	67.6%	60.0%	4.0%	11.4%	9.5%
New Mexico	28.5%	53.1%	45.1%	32.5%	62.1%	52.8%	4.0%	9.0%	7.7%
New York	36.2%	63.2%	55.2%	40.8%	69.2%	61.0%	4.6%	6.0%	5.8%
North Carolina	37.0%	58.2%	51.8%	36.4%	66.9%	58.0%	-0.6%	8.6%	6.1%
North Dakota	32.8%	57.0%	49.8%	35.4%	64.4%	56.1%	2.5%	7.4%	6.3%
Ohio	29.9%	58.6%	50.1%	39.3%	68.0%	59.8%	9.4%	9.4%	9.7%
Oklahoma	27.0%	47.4%	41.7%	34.5%	57.9%	51.4%	7.5%	10.4%	9.7%
Oregon	26.1%	60.1%	49.7%	28.4%	65.9%	55.0%	2.3%	5.8%	5.3%
Pennsylvania	37.3%	54.6%	49.9%	41.7%	64.3%	58.3%	4.4%	9.7%	8.4%
Rhode Island	34.8%	63.6%	55.1%	44.7%	73.2%	65.1%	9.9%	9.6%	10.0%
South Carolina	25.8%	51.4%	43.5%	36.1%	66.8%	57.9%	10.4%	15.5%	14.4%
South Dakota	36.6%	55.2%	49.9%	37.1%	64.7%	57.1%	0.5%	9.5%	7.2%
Tennessee	29.6%	58.9%	50.4%	36.5%	64.8%	56.7%	6.9%	5.9%	6.4%
Texas	27.9%	52.3%	44.3%	33.8%	59.8%	51.6%	5.9%	7.5%	7.3%

Table 5 (cont.)

Percentage of Women Receiving a Mammogram in the Previous 12 Months, by Age: 1997 and 2000

State	1997			2000			Change, 1997 to 2000		
	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over
Utah	24.7%	51.9%	42.6%	28.4%	55.5%	46.7%	3.7%	3.6%	4.1%
Vermont	22.4%	56.2%	45.3%	31.7%	65.5%	55.2%	9.3%	9.3%	9.9%
Virginia	28.8%	57.1%	47.4%	38.3%	63.3%	55.5%	9.5%	6.2%	8.1%
Washington	25.3%	57.2%	46.8%	33.0%	60.5%	52.0%	7.6%	3.3%	5.2%
West Virginia	28.1%	51.7%	45.4%	35.4%	63.6%	56.4%	7.3%	11.8%	11.0%
Wisconsin	24.4%	54.4%	45.3%	34.3%	64.7%	55.9%	9.9%	10.3%	10.6%
Wyoming	27.0%	52.8%	44.3%	26.6%	58.3%	48.6%	-0.4%	5.6%	4.3%
All States									
Median	29.9%	57.0%	49.3%	36.3%	64.7%	56.1%	5.0%	8.0%	7.7%
Maximum	39.1%	69.8%	58.6%	48.2%	77.0%	66.8%	14.8%	26.4%	23.0%
Minimum	19.2%	41.4%	37.9%	23.5%	53.3%	45.5%	-4.2%	0.5%	1.9%

Source: CDC, Behavioral Risk Factor Surveillance Survey, 1997 and 2000.

Table 6

Correlation Coefficients for the Change in the Percentage of Women 40 and Older who Received Mammograms in the Previous 12 Months

Spearman Rank-Order Correlation Coefficient	
Variables	Change in the percentage of women 40 and older who received mammograms in the previous 12 months, 1997 to 2000
Percentage change in number of mammography facilities, 1997 to present	-0.034
Percentage change in population of women 40 and older, 1997 to 1999	-0.401*
Percentage of women 40 and older who received a mammogram in the previous 12 months, 1997	-0.334**
Mammography facilities per 10,000 women 40 and older, 1997	0.164
*Statistically significant at the 99 percent level. **Statistically significant at the 95 percent level.	

Table 7

Percentage of Women With a Breast Exam in the Last Year Who Also Received a Mammogram, 1997 and 2000

State	1997			2000			Change, 1997 to 2000		
	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over
Alabama	46.3%	81.8%	70.2%	46.8%	86.4%	74.9%	0.6%	4.6%	4.8%
Alaska	37.6%	81.2%	63.1%	40.5%	86.4%	67.4%	2.9%	5.2%	4.3%
Arizona	49.8%	71.7%	65.0%	63.9%	86.9%	80.7%	14.1%	15.2%	15.7%
Arkansas	47.3%	71.3%	64.5%	51.3%	85.1%	76.2%	4.0%	13.8%	11.7%
California	44.1%	81.5%	69.7%	42.0%	85.4%	71.7%	-2.0%	4.0%	2.0%
Colorado	46.4%	78.4%	67.0%	39.1%	84.7%	69.8%	-7.3%	6.3%	2.8%
Connecticut	41.2%	82.5%	68.6%	50.7%	88.7%	77.5%	9.5%	6.2%	8.9%
Delaware	49.9%	81.8%	72.2%	49.0%	91.4%	78.9%	-0.9%	9.6%	6.7%
District of Columbia	39.1%	72.9%	62.3%	55.4%	85.5%	75.2%	16.3%	12.6%	12.9%
Florida	43.8%	82.5%	72.5%	52.9%	86.1%	78.2%	9.2%	3.6%	5.7%
Georgia	43.5%	74.1%	63.2%	46.4%	81.1%	70.3%	2.9%	7.0%	7.1%
Hawaii	48.5%	80.1%	70.8%	51.9%	87.3%	76.8%	3.4%	7.1%	6.0%
Idaho	31.5%	75.6%	61.9%	36.0%	78.4%	66.3%	4.5%	2.8%	4.4%
Illinois	39.7%	79.7%	67.0%	50.0%	84.7%	73.8%	10.3%	4.9%	6.8%
Indiana	47.0%	74.1%	65.6%	48.5%	86.0%	74.5%	1.5%	12.0%	9.0%
Iowa	43.2%	75.5%	66.2%	46.4%	84.4%	74.3%	3.2%	8.9%	8.1%
Kansas	42.9%	75.6%	65.1%	48.2%	85.2%	74.3%	5.4%	9.6%	9.2%
Kentucky	48.6%	83.8%	73.0%	54.5%	86.0%	77.3%	6.0%	2.2%	4.3%
Louisiana	41.3%	77.9%	65.8%	57.4%	86.4%	77.4%	16.2%	8.5%	11.6%
Maine	40.9%	78.9%	68.6%	49.2%	86.1%	75.7%	8.3%	7.2%	7.2%
Maryland	43.1%	86.5%	71.9%	45.5%	87.7%	74.1%	2.4%	1.2%	2.2%
Massachusetts	46.9%	83.7%	71.9%	53.7%	86.9%	77.3%	6.9%	3.1%	5.4%
Michigan	50.4%	81.1%	72.0%	55.3%	87.5%	77.4%	5.0%	6.4%	5.3%

Table 7 (cont.)

Percentage of Women With a Breast Exam in the Last Year Who Also Received a Mammogram, 1997 and 2000

State	1997			2000			Change, 1997 to 2000		
	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over
Minnesota	37.1%	79.3%	66.8%	49.1%	84.2%	73.2%	12.0%	4.9%	6.4%
Mississippi	43.5%	69.3%	61.4%	38.8%	77.2%	65.1%	-4.7%	7.9%	3.7%
Missouri	32.7%	77.2%	62.6%	46.8%	84.3%	73.3%	14.1%	7.1%	10.7%
Montana	43.9%	72.7%	64.3%	40.6%	83.6%	72.0%	-3.3%	10.9%	7.6%
Nebraska	35.8%	75.6%	62.8%	52.7%	87.1%	76.6%	16.9%	11.6%	13.8%
Nevada	37.8%	76.0%	64.6%	41.5%	84.3%	71.3%	3.7%	8.3%	6.7%
New Hampshire	50.1%	82.9%	72.0%	54.3%	86.7%	76.9%	4.1%	3.9%	4.9%
New Jersey	46.6%	79.0%	68.5%	52.8%	87.2%	77.1%	6.2%	8.2%	8.6%
New Mexico	42.0%	76.0%	64.7%	44.1%	83.1%	70.8%	2.2%	7.1%	6.1%
New York	44.6%	76.9%	67.2%	49.6%	86.2%	75.2%	5.0%	9.3%	8.0%
North Carolina	48.6%	78.8%	69.5%	48.2%	83.6%	73.6%	-0.4%	4.8%	4.1%
North Dakota	45.6%	81.5%	70.3%	49.3%	85.4%	75.2%	3.7%	3.9%	4.9%
Ohio	40.2%	77.2%	66.3%	55.2%	87.2%	78.3%	15.0%	9.9%	12.0%
Oklahoma	41.2%	63.4%	57.5%	49.3%	80.4%	71.8%	8.1%	17.0%	14.3%
Oregon	37.5%	77.8%	66.0%	42.3%	86.0%	73.9%	4.7%	8.2%	7.9%
Pennsylvania	47.2%	79.3%	69.6%	51.9%	83.3%	74.2%	4.7%	4.0%	4.6%
Rhode Island	46.2%	78.9%	69.3%	53.5%	87.5%	77.8%	7.3%	8.6%	8.5%
South Carolina	36.6%	75.4%	63.3%	45.4%	84.7%	73.3%	8.8%	9.3%	10.0%
South Dakota	49.6%	77.1%	69.0%	49.8%	82.2%	73.2%	0.2%	5.1%	4.2%
Tennessee	38.5%	75.1%	64.3%	51.0%	83.9%	74.5%	12.4%	8.8%	10.2%
Texas	40.6%	76.1%	64.5%	48.4%	82.1%	71.4%	7.7%	6.0%	6.9%
Utah	40.8%	72.8%	62.4%	40.9%	80.6%	67.7%	0.1%	7.8%	5.3%
Vermont	33.2%	76.9%	62.7%	41.4%	84.4%	71.1%	8.2%	7.5%	8.4%

Table 7 (cont.)

Percentage of Women With a Breast Exam in the Last Year Who Also Received a Mammogram, 1997 and 2000

State	1997			2000			Change, 1997 to 2000		
	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over	40 to 49 Years	50 Years and Over	40 Years and Over
Virginia	40.0%	78.4%	65.0%	50.8%	81.0%	71.3%	10.8%	2.6%	6.3%
Washington	36.1%	79.3%	64.9%	47.2%	81.1%	70.9%	11.0%	1.8%	6.0%
West Virginia	42.5%	79.8%	69.2%	50.4%	84.7%	75.6%	7.8%	4.9%	6.4%
Wisconsin	35.5%	78.2%	64.6%	46.7%	83.8%	73.1%	11.2%	5.6%	8.4%
Wyoming	42.4%	77.7%	65.6%	45.7%	81.4%	71.4%	3.3%	3.7%	5.8%
Puerto Rico	56.0%	70.8%	66.4%	55.1%	81.4%	74.0%	-0.9%	10.6%	7.7%
All states									
Median	43.0%	77.8%	66.1%	49.1%	84.9%	74.1%	5.0%	7.1%	6.8%
Max	56.0%	86.5%	73.0%	63.9%	91.4%	80.7%	16.9%	17.0%	15.7%
Min	31.5%	63.4%	57.5%	36.0%	77.2%	65.1%	-7.3%	1.2%	2.0%

Source: CDC, Behavioral Risk Factor Surveillance Survey, 1997 and 2000.