COMPARING HEALTH AND MEDICAL CARE ESTIMATES OF THE PHONE AND NONPHONE POPULATIONS

Martha J. Banks, The University of Chicago

In the last decade or so, telephone survey techniques have come to be considered seriously when designing a high quality survey. Reasons for this include the rising cost of field work (especially travel costs), a trend toward lower response rates in personal interview surveys (often due to respondents' fears of allowing strangers into their homes), and the recognition that most population groups have a fairly high phone coverage rate.

However, when examining data from a telephone survey, it would be extremely useful to have some idea of how estimates might differ from those which would have been obtained in a personal interview survey.

This study presents the results of one approach to measuring such differences. It uses data from a personal interview survey and estimates differences between the phone and the nonphone populations. Therefore it does not indicate all differences between results from a phone survey and a personal interview survey because it does not measure such things as differences in the answers given by the phone population when it is interviewed by phone rather than in person. It would require a special methodological study to obtain estimates of these differences. My analysis of existing data is a cost-effective way to approximate the differences between phone survey estimates and estimates from interviewing in person.

The data used in this analysis are from a national U.S. personal interview survey conducted for the Center for Health Administration Studies in 1976. This study focused on access to medical care in the United States. As part of this effort, black southerners living outsie of SMSAs and those of hispanic heritage living in the Southwest were oversampled at about 3.4 to 1. Altogether, 7787 persons in 5432 families were interviewed. The overall response rate of this area probability survey was 85 percent.

Because the focus of the study was access to medical care, I will be presenting differences in medical care estimates between the phone and nonphone populations. However, I urge those who have access to data from other subject areas to conduct the same sort of examination on those data. I believe the results in the medical care area to be quite interesting, and it would be extremely useful to see how the results compare with those obtained in other subject areas.

During the interviewing, respondents were asked for their telephone numbers so that some of the interviews could be verified. The respondent also indicated where the phone was located. Therefore, we were able to construct a variable which identifies whether on not the interviewed persons had home phones.

Table 1 shows that about 10.1% of all families and 9.3% of all persons in the U.S. had no home phone in 1976. The best predictor of phone coverage is financial status, as measured by the last two variables shown in the table: family income and poverty status. Besides the low-income population, groups with low phone coverage are southerners, especially rural southern blacks; hispanics; persons whose family head was under 25 and or divorced, separated, or never married; and those living alone or in large families of 7 or more.

Many people assume that coverage rates can be used as proxies for noncoverage bias measures. That is, they assume that the larger the percent without phones, the larger the differences between the total population and the phone population. However, data in this paper suggest that phone coverage is not as good a predictor of nonphone bias as commonly supposed.

Table 2 shows the effect on the estimated percent who have contacted a doctor during the preceeding year. Based on all persons, 76.7% of the population contacted a doctor. The figure for those with home telephones is 77.6%. The ratio of the two, .988 (given in the last column), is significantly different from 1.000 at the five standard error level. Examining this last column of Table 2 shows that there are no population groups given for which the ratio of the total estimate to the phone estimate is significantly greater than 1.000. All the ratios either are about 1.000 or are significantly below it. Therefore, using data from only the phone population would tend to overstate the percent seeing or speaking with a physician during the year.

On the other hand, comparing population subgroups using data for only those with phones would result in conclusions nearly identical to those based on comparing population groups using data for all persons. Both show that those in the Northeast are most apt to contact a doctor and those in the South (especially rural southern blacks) are the least likely to. Both data sets indicate that those in SMSAs are more likely to see or talk to a doctor than are those living outside SMSAs, as are preschool children and the divorced. Contacting a doctor is positively correlated with the finanical status of the family, as both the phone data and the total data show. Therefore, while a data set based on only the phone population may overstate the percent contacting a doctor within the year, estimates of differences between population subgroups may contain little bias.

Notice also that there is not a consistant relationship between phone coverage rates and the ratios between estimates. For example, Table 1 showed that persons in families whose head is under 25 have quite low phone coverage, only about 74%. However in Table 2, the ratio between the total and phone population estimates, .995, certainly does not suggest a larger noncoverage bias for this group than for persons in families whose heads are 25 or older.

Other tables, not shown here, present the same conclusions for several other health care variables. Each indicates that the phone population is consistantly somewhat more health-care advantaged than is the total population.

There are several ways in which these results might be used. When analyzing telephone data, a researcher might merely keep in mind the fact that

TABLE 1 - PHONE COVERAGE FOR FAMILIES AND PERSONS, CHAS 1976

CHARACTERISTIC	FAMILIES PHONE	FAMILIES NONPHONE	FAMILIES PERCENT OF U. S.	PERSONS PHONE*		PERSONS NONPHONE*	PERSONS PERCENT OF U. S
REGION							
NORTHEAST	93.8%	6.2%	22.0%	95.0%	(0.8)	5.0%	22.4%
NORTH CENTRAL	95.5	4.5	29.9	95.6	(0.6)	4.4	30.6
SOUTH	82.3	17.7	32.1	83.4	(0.9)	16.6	32.7
WEST	89.7	10.3	16.0	90.1	(1.0)	9.9	14.4
RESIDENCE							
SMSA CENTRAL CITY	88.7	11.3	28.1	90.3	(0.9)	9.7	25.6
SMSA OTHER	92.8	7.2	35.4	93.4	(0.7)	6.6	36.7
NONSMSA URBAN	88.0	12.0	12.0	88.8	(1.3)	11.2	11.7
RURAL NONFARM	86.6	13.4	19.0	86.4	(1.2)	13.6	20.1
RURAL FARM	93.5	6.5	5.4	94.2	(1.6)	5.8	5.9
RACE							
SPANISH HERITAGE, SOUTHWEST	75.4	24.6	3.2	73.8	(4.9)	26.2	4.1
OTHER WHITE	92.0	8.0	85.5	92.9	(0.5)	7.1	83.8
NONSMSA SOUTHERN BLACK	63.2	36.8	2.1	60.6	(3.9)	39.4	2.4
OTHER NONWHITE	81.5	18.5	9.2	86.3	(1.9)	13.7	9.6
AGE							
0 - 5	NA	NA	NA	85.5	(1.6)	14.5	9.3
6 - 17	NA	NA	NA	90.3	(1.0)	9.7	24.6
18 - 34	NA	NA	NA	87.8	(1.0)	12.2	25.0
35 - 54	NA	NA	NA	93.1	(0.9)	6.9	21.8
55 - 64	NA	NA	NA	95.0	(1.1)	5.0	9.4
65 PLUS	NA	NA	NA	94.3	(1.0)	5.7	10.0
AGE OF HEAD							
UNDER 25	74.9	25.1	9.1	74.2	(2.2)	25.8	6.3
25 - 34	87.2	12.8	20.2	88.0	(1.0)	12.0	21.7
35 - 44	90.9	9.1	17.7	91.0	(0.9)	9.0	26.5
45 - 54	93.4	6.6	18.1	94.0	(0.8)	6.0	21.0
55 - 64	93.1	6.9	15.6	94.2	(1.0)	5.8	12.7
65 PLUS	93.1	6.9	19.3	94.2	(1.0)	5.8	11.8
SEX OF HEAD							
MALE	90.4	9.6	77.1	91.5	(0.5)	8.5	85.2
FEMALE	88.4	11.6	22.9	86.1	(1.2)	13.9	14.8
MARITAL STATUS OF HEAD							
MARRIED	92.6	7.4	67.2	92.3	(0.5)	7.7	80.8
WIDOWED	91.3	8.7	12.6	92.0	(1.3)	8.0	6.8
DIVORCED	85.0	15.0	7.6	82.6	(2.2)	17.4	5.4
SEPARATED	74.1	25.9	4.9	73.7	(3.0)	26.3	3.5
NEVER MARRIED	79.3	20.7	7.8	80.2	(2.6)	19.8	3.5
FAMILY SIZE							
ONE	83.8	16.2	22.2	83.8	(1.5)	16.2	7.6
TWO	92.2	7.8	28.6	92.2	(0.9)	7.8	19.5
THREE	89.9	10.1	16.6	89.9	(1.1)	10.1	17.0
FOUR	93.7	6.3	14.9	93.7	(0.8)	6.3	20.3
FIVE	93.2	6.8	9.4	93.2	(1.1)	6.8	16.0
SIX	92.5	7.5	4.3	92.5	(1.6)	7.5	8.9
SEVEN OR MORE	83.7	16.3	4.0	83.2	(2.2)	16.8	10.7
ADULTS IN FAMILY							
ONE	83.7	16.3	28.0	82.9	(1.2)	17.1	13.9
TWO	91.4	8.6	53.1	90.6	(0.6)	9.4	55.9
THREE	95.4	4.6	13.1	95.0	(0.9)	5.0	18.6
FOUR OR MORE	94.8	5.2	5.8	93.6	(1.4)	6.4	11.6
FAMILY INCOME							
LESS THAN $3000	75.8	24.2	8.2	71.8	(2.4)	28.2	5.3
$ 3000 - $ 4999	79.9	20.1	11.4	74.9	(1.9)	25.1	8.9
$ 5000 - $ 6999	85.7	14.3	11.2	83.1	(1.7)	16.9	9.4
$ 7000 - $ 9999	87.5	12.5	13.5	87.3	(1.4)	12.7	12.6
$10000 - $14999	93.3	6.7	24.1	93.9	(0.8)	6.1	25.5
$15000 - $24999	97.3	2.7	21.5	97.5	(0.5)	2.5	25.9
$25000 OR MORE	97.2	2.8	10.0	98.5	(0.6)	1.5	12.4
POVERTY STATUS							
BELOW POVERTY	74.4	25.6	13.5	71.3	(1.6)	28.7	14.5
100%-125% POVERTY	83.9	16.1	6.8	86.4	(1.9)	13.6	6.7
125%-200% POVERTY	89.1	10.9	19.4	90.8	(1.0)	9.2	20.1
200%-300% POVERTY	92.0	8.0	22.3	94.3	(0.8)	5.7	24.0
300%-400% POVERTY	94.5	5.5	16.8	96.4	(0.7)	3.6	16.6
400% OR MORE POVERTY	96.7	3.3	21.2	97.7	(0.6)	2.3	18.1
TOTAL	89.9%	10.1%	100.0%	90.7%	(0.4)	9.3%	100.0%

*NUMBERS IN PARENTHESES ARE THE STANDARD ERROR ESTIMATES FOR BOTH THE PHONE AND THE NONPHONE POPULATIONS.

TABLE 2 - PERCENT CONTACTING A DOCTOR DURING THE YEAR, BY PHONE COVERAGE; CHAS 1976*

CHARACTERISTIC	PERCENT CONTACTING A DOCTOR DURING THE YEAR			RATIOS OF THE PERCENTS	
	PHONE POPULATION	NONPHONE POPULATION	TOTAL POPULATION	NONPHONE POPULATION TO PHONE POPULATION	TOTAL POPULATION TO PHONE POPULATION
REGION					
NORTHEAST	81.4% (1.4)	74.8% (6.4)	81.1% (1.4)	.918 (.081)	.996 (.004)
NORTH CENTRAL	76.6 (1.3)	83.5 (5.3)	76.9 (1.3)	1.089 (.071)	1.004 (.003)
SOUTH	74.8 (1.2)	66.4 (2.5)	73.4 (1.1)	.888 (.036)	.981 (.006)
WEST	79.2 (1.5)	52.0 (4.7)	76.5 (1.5)	.656 (.060)	.966 (.006)
RESIDENCE					
SMSA CENTRAL CITY	78.1 (1.3)	69.1 (3.8)	77.2 (1.3)	.885 (.051)	.989 (.005)
SMSA OTHER	79.9 (1.1)	67.5 (4.2)	79.1 (1.1)	.845 (.054)	.990 (.004)
NONSMSA URBAN	75.1 (1.9)	68.7 (4.2)	74.4 (1.7)	.915 (.061)	.990 (.007)
RURAL NONFARM	76.0 (1.6)	66.5 (3.7)	74.7 (1.5)	.875 (.052)	.983 (.007)
RURAL FARM	70.6 (3.2)	63.3 (10.6)	70.2 (3.1)	.896 (.155)	.994 (.009)
RACE					
SPANISH HERITAGE, SOUTHWEST	72.0 (5.7)	44.0 (11.0)	64.7 (5.3)	.612 (.160)	.898 (.042)
OTHER WHITE	78.0 (0.8)	72.0 (2.9)	77.5 (0.8)	.924 (.039)	.995 (.003)
NONSMSA SOUTHERN BLACK	69.6 (4.7)	58.2 (6.5)	65.1 (3.8)	.827 (.110)	.936 (.043)
OTHER NONWHITE	77.5 (3.8)	74.4 (8.4)	77.0 (3.4)	.960 (.118)	.994 (.016)
AGE					
0 - 5	89.3 (1.6)	76.1 (4.5)	87.4 (1.5)	.852 (.053)	.978 (.008)
6 - 17	71.6 (1.6)	53.9 (4.8)	69.9 (1.5)	.753 (.069)	.976 (.007)
18 - 34	79.0 (1.3)	73.1 (3.2)	78.3 (1.2)	.925 (.043)	.991 (.005)
35 - 54	76.0 (1.5)	65.9 (4.8)	75.3 (1.5)	.868 (.065)	.991 (.004)
55 - 64	79.6 (2.1)	81.7 (6.5)	79.7 (2.0)	1.027 (.086)	1.001 (.004)
65 PLUS	79.9 (1.9)	69.5 (6.7)	79.3 (1.8)	.870 (.086)	.993 (.005)
AGE OF HEAD					
UNDER 25	82.5 (2.3)	80.9 (3.6)	82.1 (2.0)	.981 (.052)	.995 (.013)
25 - 34	82.4 (1.3)	69.1 (3.7)	80.8 (1.2)	.838 (.046)	.980 (.006)
35 - 44	75.0 (1.5)	54.4 (4.8)	73.2 (1.4)	.725 (.065)	.975 (.006)
45 - 54	75.3 (1.6)	70.9 (5.2)	75.0 (1.5)	.943 (.072)	.997 (.004)
55 - 64	78.3 (1.9)	74.0 (6.2)	78.1 (1.8)	.945 (.082)	.997 (.005)
65 PLUS	76.1 (1.9)	64.2 (6.2)	75.4 (1.8)	.844 (.084)	.991 (.005)
SEX OF HEAD					
MALE	77.2 (0.8)	63.7 (2.4)	76.0 (0.7)	.825 (.032)	.985 (.003)
FEMALE	80.2 (1.5)	81.6 (3.1)	80.4 (1.3)	1.019 (.043)	1.003 (.006)
MARITAL STATUS OF HEAD					
MARRIED	77.5 (0.8)	64.8 (2.6)	76.5 (0.8)	.835 (.035)	.987 (.003)
WIDOWED	75.1 (2.2)	69.2 (6.1)	74.6 (2.1)	.922 (.085)	.994 (.007)
DIVORCED	84.1 (2.3)	79.4 (5.7)	83.3 (2.2)	.944 (.072)	.990 (.013)
SEPARATED	75.6 (3.6)	73.5 (5.2)	75.1 (3.0)	.972 (.083)	.993 (.022)
NEVER MARRIED	77.1 (3.1)	69.0 (6.1)	75.5 (2.8)	.895 (.087)	.979 (.017)
FAMILY SIZE					
ONE	78.7 (1.9)	68.7 (4.4)	77.1 (1.7)	.874 (.059)	.980 (.010)
TWO	79.6 (1.5)	74.4 (4.5)	79.2 (1.4)	.935 (.059)	.995 (.005)
THREE	79.0 (1.5)	74.1 (4.1)	78.5 (1.4)	.938 (.055)	.994 (.006)
FOUR	82.4 (1.4)	68.2 (5.0)	81.5 (1.3)	.827 (.062)	.989 (.004)
FIVE	77.7 (1.9)	67.5 (6.2)	77.0 (1.8)	.869 (.082)	.991 (.006)
SIX	71.0 (2.9)	73.2 (6.9)	71.2 (2.7)	1.031 (.105)	1.002 (.008)
SEVEN OR MORE	65.9 (3.1)	52.7 (6.2)	63.7 (2.8)	.801 (.102)	.967 (.017)
ADULTS IN FAMILY					
ONE	81.7 (1.4)	74.1 (3.1)	80.4 (1.2)	.906 (.041)	.984 (.007)
TWO	78.7 (0.9)	66.2 (2.7)	77.5 (0.9)	.842 (.036)	.985 (.003)
THREE	75.0 (1.8)	65.3 (6.6)	74.5 (1.8)	.871 (.090)	.994 (.005)
FOUR OR MORE	72.4 (2.6)	60.3 (9.4)	71.7 (2.5)	.832 (.134)	.989 (.009)
FAMILY INCOME					
LESS THAN $3000	71.3 (2.9)	69.0 (4.4)	70.6 (2.4)	.968 (.073)	.991 (.021)
$ 3000 - $ 4999	77.2 (2.2)	69.0 (3.9)	75.1 (1.9)	.894 (.056)	.973 (.014)
$ 5000 - $ 6999	76.5 (2.1)	63.4 (4.7)	74.3 (2.0)	.829 (.065)	.971 (.011)
$ 7000 - $ 9999	75.4 (1.9)	61.8 (4.9)	73.7 (1.8)	.819 (.069)	.977 (.009)
$10000 - $14999	76.3 (1.4)	75.5 (4.8)	76.3 (1.3)	.988 (.066)	.999 (.004)
$15000 - $24999	79.4 (1.4)	62.7 (9.1)	79.0 (1.3)	.789 (.116)	.995 (.003)
$25000 OR MORE	81.0 (2.0)	80.8 (12.5)	81.0 (2.0)	.997 (.157)	1.000 (.002)
POVERTY STATUS					
BELOW POVERTY	72.4 (1.9)	66.8 (2.9)	70.7 (1.6)	.923 (.048)	.978 (.014)
100% - 125% POVERTY	74.9 (2.7)	62.4 (6.0)	73.2 (2.5)	.834 (.086)	.977 (.012)
125% - 200% POVERTY	74.3 (1.6)	66.7 (4.3)	73.6 (1.5)	.898 (.061)	.991 (.006)
200% - 300% POVERTY	77.2 (1.4)	70.5 (5.1)	76.8 (1.4)	.914 (.069)	.995 (.004)
300% - 400% POVERTY	79.7 (1.6)	73.5 (7.8)	79.5 (1.6)	.922 (.099)	.997 (.004)
400% OR MORE POVERTY	83.4 (1.4)	74.7 (9.4)	83.2 (1.4)	.895 (.114)	.998 (.003)
TOTAL	77.6% (0.7)	67.7% (2.0)	76.7% (0.6)	.872 (.026)	.988 (.002)

*NUMBERS IN PARENTHESES ARE THE STANDARD ERROR ESTMATES.

the entire population might be a bit more disadvantaged than the data suggest. This approach would be most appropriate when working with sample sizes small enough that the bias would comprise only a small part of the total error. When a larger-scale survey is planned, the phone data might be adjusted in some way so that the entire population is approximated more closely.

I used stepwise discriminant analysis to identify which variables were most associated with differential phone coverage. The results then were used to construct a composite variable that distinguishes groups with relatively high or low phone coverage. I did this twice, once using both demographic and medical care variables and then using just demographic variables. Using the results of the discriminant analysis based on the demographic variables only, I formed the weighting categories given in Table 3. Categories like the first couple (poor persons with family heads under 25 and poor persons who are southern blacks) have weights of about 1.9, indicating that nearly half of the persons in these groups do not have phones. Some of the last categories in the table have weights just a bit above 1.0, indicating that nearly all persons in such groups have phones.

Tables 4 and 5 compare results when the phone population is adjusted by these weights. I also did this using the weight based on both medical care and demographic variables. The results showed the latter adjustment was not really superior to the results from adjusting by the demographic only weight, so the results are not presented here. The demographic only adjustment has the advantage of being useful to survey researchers interested in subject matters other than health.

Table 4 indicates the effect of the adjustment on basic demographic variables. The adjusted phone data approximates the data for the total population better than does the unadjusted phone data. This is the case even when the demographic variable was not used directly in the adjustment weight construction. For example, consider region, the first variable in Table 4. NonSouth-South was the only regional distinction used in the weights to adjust the phone data. Nevertheless, the adjusted phone data is closer to the total population data for persons in the Northeast, North Central, and South; and the estimate for the Western U.S. is only slightly worse.

Table 5 and similar tables not presented here are most important, because they show the effect of the adjustment on selected health variables. Unfortunately, these tables do not show the improvement that Table 4 showed in the distribution by demographic variables. The ratios of the total estimates to phone estimates in these tables really are not much closer to 1.0 than are the ratios using the unadjusted phone data. In Table 5, presenting data on the percent contacting a doctor during the year, the ratio for the total population is virtually unchanged. None of the subgroups shows any real improvement with the adjustment.

There are a few estimates in tables not shown here that are improved by the adjustment, especially in the estimated percent who were completely satisfied with their most recent medical visit. For example, the ratio for the total population improves to .995, while the unadjusted ratio was .985. However, in general I would say that the adjustment process allows the adjusted phone data to approximate the total data fairly well in terms of demographics, but it still provides estimates that somewhat overrepresent the health-advantaged population.

I suppose that these results are not that unexpected, for two reasons. One reason is that, as was said earlier, the correlation between phone coverage and the amount of difference in medical care estimates is not as great as generally supposed. However I had hoped that the correlation would be large enough that an adjustment by coverage rates would make a substantial improvement in the phone population estimates.

The second reason that these results are not all that unexpected is that the ratios were fairly close to 1.0 in the unadjusted data, even though many were significantly different from 1.0 statistically. Because they were so close to 1.0, there really was not much room for improvement.

When running the stepwise discriminant analysis which included health care variables, the only medical care variable which had large Fs was a three-category insurance variable: without insurance, with Medicaid or other reduced price insurance, and with regular group or individual insurance coverage. The Fs of the dependent variables in Table 5 and other tables not shown here (contact with a doctor and so on) were quite low. This indicates that other differences between the phone and nonphone populations were more important.

However, if possible, I would like suggestions on any other avenues to explore in terms of adjusting the phone population data so that it better approximates the total population.

TABLE 3 - WEIGHTING CATEGORIES AND WEIGHTS, CATEGORIZATION BASED ON DEMOGRAPHIC VARIABLES ONLY: CHAS 1976

CATEGORY	POVERTY STATUS	AGE OF HEAD	RACE	REGION	ADULTS IN FAMILY, MARITAL STATUS OF HEAD	RESIDENCE	PERCENT OF TOTAL POPULATION	WEIGHT
1	poor	under 25	all	all	all	all	1.2%	1.8810
2	poor	25 plus	So. Black	all	all	all	1.3	1.9472
3	poor	25 plus	Spanish SW	all	all	all	1.6	1.5998
4	poor	25 - 34	other	South	all	all	0.9	1.9816
5	poor	35 - 64	other	South	all	all	3.1	1.4039
6	poor	65 plus	other	South	all	all	1.0	1.1532
7	poor	25 - 24	other	nonsouth	all	all	1.3	1.4460
8	poor	35 - 64	other	nonsouth	2 plus, not sep. or div.	all	2.1	1.1550
9	poor	35 - 64	other	nonsouth	all	all	0.8	1.2987
10	poor	65 plus	other	nonsouth	all	all	1.3	1.0456
11	nonpoor	under 25	all	South	all	all	1.7	1.5484
12	nonpoor	under 25	all	nonsouth	2 plus, not sep. or div.	all	2.6	1.1584
13	nonpoor	under 25	all	nonsouth	other than above	all	0.9	1.1793
14	nonpoor	25 - 34	all	South	2 plus, not sep. or div.	all	4.8	1.1836
15	nonpoor	25 - 34	all	South	other than above	all	0.9	1.4978
16	nonpoor	25 - 34	all	nonsouth	separated or divorced	all	1.3	1.0748
17	nonpoor	25 - 34	all	nonsouth	1,not separated or div.	all	0.9	1.0706
18	nonpoor	25 - 34	all	nonsouth	2,not separated or div.	rural nonfarm	1.6	1.0330
19	nonpoor	25 - 34	all	nonsouth	2,not separated or div.	other	8.8	1.0326
20	nonpoor	25 - 34	all	nonsouth	3 plus, not sep. or div.	all	0.8	1.0651
21	nonpoor	35 plus	So. Black	all	all	all	0.8	1.2073
22	nonpoor	35 plus	Spanish SW	all	all	all	1.4	1.1337
23	nonpoor	35 plus	other	South	separated or divorced	all	0.9	1.2004
24	nonpoor	35 - 64	other	South	1,not separated or div.	all	0.6	1.1008
25	nonpoor	35 - 64	other	South	2,not separated or div.	all	7.0	1.0425
26	nonpoor	35 - 64	other	South	3,not separated or div.	all	4.2	1.0376
27	nonpoor	35 - 64	other	South	4 plus, not sep. or div.	all	1.7	1.1283
28	nonpoor	65 plus	other	South	all	all	2.1	1.0737
29	nonpoor	35 - 64	other	nonsouth	1,separated or div.	all	1.2	1.0886
30	nonpoor	35 - 64	other	nonsouth	2 plus, sep. or div.	all	1.4	1.0556
31	nonpoor	35 - 64	other	nonsouth	1, not separated or div.	all	1.7	1.0700
32	nonpoor	35 - 64	other	nonsouth	2,not sep. or div.	rural nonfarm	2.8	1.0301
33	1-2 poverty	35 - 64	other	nonsouth	2,not sep. or div.	other	2.8	1.0414
34	2+ poverty	35 - 64	other	nonsouth	2,not sep. or div.	other	10.9	1.0231
35	nonpoor	35 - 64	other	nonsouth	3,not sep. or div.	rural nonfarm	1.5	1.0000
36	nonpoor	35 - 64	other	nonsouth	3,not sep. or div.	other	7.5	1.0339
37	nonpoor	35 - 64	other	nonsouth	4 plus, not sep. or div.	all	6.5	1.0143
38	nonpoor	65 plus	other	nonsouth	2 plus, not sep. or div.	all	4.9	1.0188
39	nonpoor	65 plus	other	nonsouth	other than above	all	1.8%	1.0506

TABLE 4 - PERCENT OF THE POPULATION BY DEMOGRAPHIC CHARACTERISTICS, TOTAL POPULATION AND UNADJUSTED AND ADJUSTED PHONE POPULATIONS; CHAS 1976

CHARACTERISTIC	TOTAL POPULATION	PHONE POPULATION UNADJUSTED	PHONE POPULATION ADJUSTED
REGION			
NORTHEAST	22.39%	23.46%	22.47%
NORTH CENTRAL	30.57	32.23	30.83
SOUTH	32.67	30.03	32.61
WEST	14.37	14.28	14.10
RESIDENCE			
SMSA CENTRAL CITY	25.59	25.47	25.95
SMSA OTHER	36.65	37.75	36.90
NONSMSA URBAN	11.74	11.49	11.63
RURAL NONFARM	20.14	19.18	19.41
RURAL FARM	5.88	6.11	6.11
RACE			
SPANISH HERITAGE, SOUTHWEST	4.14	3.37	3.96
OTHER WHITE	83.82	85.86	84.21
NONSMSA SOUTHERN BLACK	2.44	1.62	2.29
OTHER NONWHITE	9.60	9.13	9.54
AGE			
0 - 5	9.32	8.78	9.29
6 - 17	24.59	24.48	24.44
18 - 34	24.97	24.17	24.95
35 - 54	21.76	22.34	21.68
55 - 64	9.35	9.80	9.55
65 PLUS	10.03	10.43	10.09
AGE OF HEAD			
UNDER 25	6.35	5.19	6.35
25 - 34	21.67	21.02	21.66
35 - 44	26.46	26.55	26.02
45 - 54	20.99	21.76	21.12
55 - 64	12.72	13.22	12.91
65 PLUS	11.81	12.27	11.94
SEX OF HEAD			
MALE	85.16	85.92	84.82
FEMALE	14.84	14.08	15.18

CHARACTERISTIC	TOTAL POPULATION	PHONE POPULATION UNADJUSTED	PHONE POPULATION ADJUSTED
MARITAL STATUS OF HEAD			
MARRIED	80.85	82.30	81.04
WIDOWED	6.77	6.87	6.97
DIVORCED	5.41	4.94	5.36
SEPARATED	3.50	2.85	3.20
NEVER MARRIED	3.46	3.06	3.43
FAMILY SIZE			
ONE	7.56	6.99	7.31
TWO	19.54	19.86	19.45
THREE	17.03	16.89	16.90
FOUR	20.31	20.98	20.91
FIVE	15.96	16.40	16.27
SIX	8.88	9.06	8.89
SEVEN OR MORE	10.71	9.82	10.28
ADULTS IN FAMILY			
ONE	13.88	12.67	13.59
TWO	55.95	55.89	55.47
THREE	18.56	19.44	18.93
FOUR OR MORE	11.63	12.00	12.01
FAMILY INCOME			
LESS THAN $3000	5.29	4.20	5.04
$ 3000 - $ 4999	8.93	7.37	8.43
$ 5000 - $ 6999	9.93	8.61	9.27
$ 7000 - $ 9999	12.61	12.13	12.38
$10000 - $14999	25.47	26.38	25.71
$15000 - $24999	25.94	27.90	26.54
$25000 OR MORE	12.36	13.42	12.63
POVERTY STATUS			
BELOW POVERTY	14.51	11.41	14.51
100%-125% POVERTY	6.69	6.38	6.26
125%-200% POVERTY	20.08	20.10	19.57
200%-300% POVERTY	23.98	24.92	24.03
300%-400% POVERTY	16.62	17.66	17.05
400% OR MORE POVERTY	18.12%	19.52%	18.58%

TABLE 5 - PERCENT CONTACTING A DOCTOR DURING THE YEAR, ADJUSTED AND UNADJUSTED PHONE DATA; CHAS 1976*

CHARACTERISTIC	PHONE ESTIMATE ADJUSTED	PHONE ESTIMATE UNADJUSTED	RATIO, TOTAL TO PHONE ADJUSTED	RATIO, TOTAL TO PHONE UNADJUSTED
REGION				
NORTHEAST	81.4%	81.4%(1.4)	.996	.996 (.004)
NORTH CENTRAL	76.8	76.6 (1.3)	1.001	1.004 (.003)
SOUTH	75.0	74.8 (1.2)	.979	.981 (.006)
WEST	78.8	79.2 (1.5)	.972	.966 (.006)
RESIDENCE				
SMSA CENTRAL CITY	78.1	78.1 (1.3)	.989	.989 (.005)
SMSA OTHER	79.9	79.9 (1.1)	.990	.990 (.004)
NONSMSA URBAN	74.6	75.1 (1.9)	.997	.990 (.007)
RURAL NONFARM	76.1	76.0 (1.6)	.982	.983 (.007)
RURAL FARM	71.2	70.6 (3.2)	.986	.994 (.009)
RACE				
SPANISH HERITAGE, SOUTHWEST	71.2	72.0 (5.7)	.908	.898 (.042)
OTHER WHITE	78.1	78.0 (0.8)	.993	.995 (.003)
NONSMSA SOUTHERN BLACK	69.0	69.6 (4.7)	.943	.936 (.043)
OTHER NONWHITE	77.5	77.5 (3.8)	.994	.994 (.016)
AGE				
0 - 5	89.7	89.3 (1.6)	.974	.978 (.008)
6 - 17	71.5	71.6 (1.6)	.978	.976 (.007)
18 - 34	79.0	79.0 (1.3)	.991	.991 (.005)
35 - 54	76.1	76.0 (1.5)	.990	.991 (.004)
55 - 64	79.5	79.6 (2.1)	1.003	1.001 (.004)
65 PLUS	79.8	79.9 (1.9)	.994	.993 (.005)
AGE OF HEAD				
UNDER 25	82.0	82.5 (2.3)	1.001	.995 (.013)
25 - 34	82.3	82.4 (1.3)	.982	.980 (.006)
35 - 44	74.9	75.0 (1.5)	.977	.975 (.006)
45 - 54	75.1	75.3 (1.6)	.998	.997 (.004)
55 - 64	78.2	78.3 (1.9)	.998	.997 (.005)
65 PLUS	75.9	76.1 (1.9)	.994	.991 (.005)
SEX OF HEAD				
MALE	77.2	77.2 (0.8)	.985	.985 (.003)
FEMALE	79.9	80.2 (1.5)	1.006	1.003 (.006)
MARITAL STATUS OF HEAD				
MARRIED	77.5%	77.5%(0.8)	.987	.987 (.003)
WIDOWED	74.3	75.1 (2.2)	1.003	.994 (.007)
DIVORCED	84.1	84.1 (2.3)	.990	.990 (.013)
SEPARATED	74.9	75.6 (3.6)	1.002	.993 (.022)
NEVER MARRIED	77.0	77.1 (3.1)	.980	.979 (.017)
FAMILY SIZE				
ONE	78.6	78.7 (1.9)	.980	.980 (.010)
TWO	79.6	79.6 (1.5)	.994	.995 (.005)
THREE	79.2	79.0 (1.5)	.992	.994 (.006)
FOUR	82.3	82.4 (1.4)	.990	.989 (.004)
FIVE	77.4	77.7 (1.9)	.995	.991 (.006)
SIX	70.5	71.0 (2.9)	1.009	1.002 (.008)
SEVEN OR MORE	66.7	65.9 (3.1)	.954	.967 (.017)
ADULTS IN FAMILY				
ONE	81.4	81.7 (1.4)	.987	.984 (.007)
TWO	78.6	78.7 (0.9)	.986	.985 (.003)
THREE	75.0	75.0 (1.8)	.994	.994 (.005)
FOUR OR MORE	72.4	72.4 (2.6)	.990	.989 (.009)
FAMILY INCOME				
LESS THAN $3000	71.9	71.3 (2.9)	.982	.991 (.021)
$ 3000 - $ 4999	77.3	77.2 (2.2)	.972	.973 (.014)
$ 5000 - $ 6999	76.4	76.5 (2.1)	.972	.971 (.011)
$ 7000 - $ 9999	75.3	75.4 (1.9)	.979	.977 (.009)
$10000 - $14999	76.4	76.3 (1.4)	.999	.999 (.004)
$15000 - $24999	79.6	79.4 (1.4)	.993	.995 (.003)
$25000 OR MORE	81.0	81.0 (2.0)	.999	1.000 (.002)
POVERTY STATUS				
BELOW POVERTY	72.9	72.4 (1.9)	.971	.978 (.014)
100%-125% POVERTY	75.0	74.9 (2.7)	.975	.977 (.012)
125%-200% POVERTY	74.4	74.3 (1.6)	.989	.991 (.006)
200%-300% POVERTY	77.4	77.2 (1.4)	.992	.995 (.004)
300%-400% POVERTY	79.7	79.7 (1.6)	.997	.997 (.004)
400% OR MORE POVERTY	83.5	83.4 (1.4)	.997	.998 (.003)
TOTAL	77.5%	77.6%(0.7)	.989	.988 (.002)

*NUMBERS IN PARENTHSES ARE THE STANDARD ERROR ESTMATES.