A National-Level Study of Food Stamp Program Participation among American Indians: 1988-2004

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The economic status of American Indians is substantially worse than that of the general population in the United States. For example, per-capita incomes are 40 percent below national averages (Leichenko, 2003), and large numbers of American Indians have earnings in the lower end of the income distribution (Gregory et al., 1997). These economic hardships are also reflected in the lower average incomes in counties with a high proportion of American Indians (Leichenko, 2003, Table 2). These economic hardships are correlated with a slew of negative consequences including food insecurity, food insecurity with hunger, high rates of obesity, high prevalences of diabetes, high rates of tooth decay, and low rates of breastfeeding. For example, one-in-five American Indians were food insecure in 2003 in comparison to about one-in-eight for the entire population and the rates of food insecurity with hunger were twice as high for American Indians (Gundersen, 2006).

Current efforts to address these negative consequences associated with these resource-constrained food problems include several food assistance programs. The focus of this paper is on the Food Stamp Program. In 2003, 23.9 million low-income Americans received food stamps resulting in 24.6 billion dollars in benefits. Given the high poverty rates among American Indians, a large proportion of American Indians would be eligible for food stamps and presumably would benefit from their receipt. In light of the importance of food stamps, understanding the food stamp usage by American Indians viz. the general population seems relevant. This paper represents the first examination of food stamp use among American Indians at the national level.

We first consider how the participation rates among American Indians in the Food Stamp Program compares to the general population? To do so, we use data from the

1989 to 2004 March Supplements of the Current Population Survey (CPS). We establish the food stamp participation rate (i.e., the number of food stamp households divided by the number of eligible households) for each of these years. The use of multiple years allows us to ascertain how the participation rate may have changed over time. The CPS has been used extensively in other research on the Food Stamp Program. (For recent work, see, e.g., Borjas, 2004; Gundersen and Offutt, 2005; Jolliffe et al., 2005.)

We next consider whether, after controlling for other factors, if American Indians have higher rates food stamp participation than the rest of the population. Given the serious economic challenges facing many American Indians, we would expect higher participation rates among American Indians in comparison to the population as a whole. After controlling for other factors, however, whether or not they have higher rates is not clear. On the one hand, many American Indians face long-stints of poverty. In light of previous research on the connection between length of poverty spells and food stamp participation (e.g., Blank and Ruggles, 1996) we may expect higher rates of food stamp participation among American Indians once we hold other current factors (e.g., current income, education level, number of children) constant. On the other hand, the transactions costs associated with applying for food stamps may be higher for American Indians on Reservations and in rural areas where there are greater distances to Food Stamp Program offices. Research on individual reservations has found these transactions costs to be especially relevant (Davis, 1998 as summarized in Vandeman, 1998.) All else equal, these higher transactions costs will lead to lower rates of food stamp participation. In addition, unlike for other populations, American Indians living on reservations can choose to participate in either the Food Stamp Program or the Food Distribution

Programs on Indian Reservations (FDPIR) but not both. This may further limit the probability of receiving food stamps for a subset of American Indians in rural areas, namely those living on reservations. To control for the influence of location on the probability of food stamp participation, we also include an interaction between non-metro location and American Indian status.

We find that, as expected, American Indians have higher rates of participation in the Food Stamp Program than the general population. Once things are broken down into sub-categories (e.g., households with children) these differences generally disappear. These differences reappear once we control for other factors. We further find some evidence that the location of American Indians matters; those living in nonmetro areas are more likely to receive food stamps than those in metro areas.

Background, Data, and Methodology

Food Stamp Program

The Food Stamp Program, with a few exceptions, is available to all families meeting income and asset tests. To receive food stamps, households must meet three financial criteria: a gross-income test, a net-income test, and an asset test. A household's gross income before taxes in the previous month cannot exceed 130 percent of the poverty line, and net monthly income cannot exceed the poverty line.[1] Finally, income-eligible households with assets less than $2,000 qualify for the program. The value of a vehicle above $4,650 is considered an asset unless it is used for work or for the

[1] Net income is calculated by subtracting a standard deduction from a household's gross income. In addition to this standard deduction, households with labor earnings deduct 20 percent of those earnings from their gross income. Deductions are also taken for child care and/or care for disabled dependents, medical expenses, and excessive shelter expenses.

transportation of disabled persons. Households receiving Temporary Assistance for Needy Families (TANF) and households where all members receive Supplemental Security Income (SSI) are categorically eligible for food stamps and do not have to meet these three tests.

A large fraction of households eligible for food stamps do not participate. This outcome is often ascribed to three main factors. First, there may be stigma associated with receiving food stamps. Stigma encompasses a wide variety of sources, from a person's own distaste for receiving food stamps to the fear of disapproval from others when redeeming food stamps to the possible negative reaction of caseworkers (Ranney and Kushman, 1987; Moffitt, 1983). Second, transaction costs can diminish the attractiveness of participation.[2] A household faces these costs on a repeated basis when it must recertify its eligibility. Third, against these costs, the benefit level may be too small to induce participation; food stamp benefits can be as low as $10 a month for a family.

Data

The CPS is administered monthly by the Census Bureau for the Bureau of Labor Statistics to approximately 50,000 households. This nationally representative survey is the primary source of information on the U.S. labor force. In this paper we use data from the March Demographic Files from the CPS for the years 1989 to 2005. The questions in

[2] Examples of such costs include travel time to a food stamp office and time spent in the office, the burden of transporting children to the office or paying for child care services, and the direct costs of paying for transportation.

the survey refer to the previous year and so our analyses refer to the years 1988 to 2004.[3] The March CPS is used to calculate the official poverty rates for the U.S. In this paper we rely on five primary groups of questions – food stamp participation; income; returns from assets; source of earnings; and demographic characteristics.

Central to this paper is one of the demographic characteristics, the racial category of the household head. From the 1989 to 2002 CPS, there were four questions used to establish race. In households where the respondent answered "American Indian, Aleut, or Eskimo", the household is defined as American Indian. Beginning in the 2003 CPS, persons were allowed to report multiple races. The possible combinations which lead to a designation of American Indian for this article are "American Indian or Alaskan", "white and American Indian," "black and American Indian,", "American Indian and Asian", "white, black, and American Indian," "white, American Indian, and Asian," and "white, black, American Indian, and Asian." This change resulted in a decrease in the percentage of persons who reported that they were only American Indian but, overall, an increase in the percentage of persons who reported that they were at least part American Indian. Insofar as it is unlikely that there was an increase in the percentage of the population that is American Indian, the increase is presumably due to persons who may have identified, say, as "black" before but now identify as "black-American Indian." In this article, we define anyone in the 2003, 2004, and 2005 CPS who reported that they were at least part American Indian as "American Indian." We also consider how the results may differ if an alternative definition of American Indian is used for these years.

[3] In general, a household is observed in two successive years in the March CPS. In response, we only include households the first time they are observed in the CPS.

Empirical Model

To analyze the effect of being an American Indian on the probability of food stamp participation, controlling for other factors, we proceed by estimating the following probit maximum likelihood (MLE) model:

$FOODSTAMP_i=1$ if $FOODSTAMP_i^*>0$; $FOODSTAMP_i=0$ otherwise (1)

$$FOODSTAMP_i^* = \alpha AI_i+\delta NONMETRO_i+\boldsymbol{\beta}\mathbf{X}_i+\boldsymbol{\gamma}\mathbf{Y}_i+u_i$$

where i denotes a household, AI=1 if the household is headed by an American Indian, 0 otherwise; NONMETRO=1 if a household lives in a nonmetro area, 0 otherwise; **X** is a vector of covariates reflecting economic resources; **Y** is a vector reflecting non-economic resources; and *u* is an error term. Included in **Y** is a vector of year fixed effects to control for the different CPS years being used. We are especially interested in the sign, magnitude, and significance of α (i.e, the effect of being American Indian on the probability of receiving food stamps). In estimating this model, we will confine our sample to households eligible for the Food Stamp Program where we define an eligible household in the following manner.

We first use only the gross income test to define who is eligible. In other words, a household is identified as eligible if they meet the gross income test; i.e., if their total household income is less than 130 percent of the poverty line. Under the second method, a household is identified as eligible if they meet both the gross income test and asset test. We do not directly observe asset levels in the CPS. We do, however, observe the amount of dividend and interest income received by households in the past year. Under the assumption that the annual return is the same as on a 3-month Treasury Bill we then establish the asset level for each household.

For reasons noted above, the location of American Indians may have an influence on the food stamp participation decision. To incorporate this, we estimate equation (1) using an interaction between American Indian status and nonmetro status.

Results

Descriptive Results

In Figure 1 we begin with a description of three-year moving averages of food stamp participation rates for American Indians and non-American Indians from 1989 to 2003.[4] As seen, in every year participation rates of American Indians are higher than non-American Indians. This difference ranges from 4.2 to 15.0 percentage points.

In Table 1 summary statistics for when we combine all years are displayed. Our results in this table and in Figure 1 are weighted by households weights supplied within the CPS. We also want to incorporate the sampling design into our estimates. In the case of the CPS data, this information, however, has been censored from the public-use data files. To overcome this, we use an estimation strategy of creating synthetic design variables that induce a similar design effect for variance estimation. The first step of this approach is to sort the data by income.[5] Then each set of four consecutive housing units is assigned to a separate cluster. The purpose of the sorting is to induce a high level of intracluster correlation, and the choice of four matches the average cluster size of the CPS. See Jolliffe (2002/2003) for a more detailed description of the approach.

Consistent with Figure 1, for both the gross income eligible sample (the top panel) and the gross income and asset eligible sample (the bottom panel) American Indians have

[4] In Figure 1 we confine the sample to gross-income-eligible households. A similar picture emerges if we confine the sample to gross-income and asset-eligible households.
[5] The methodology requires sorting the data on the variable most relevant to the analysis.

higher food stamp participation rates than non-American Indians with the gap being smaller for the latter sample. This comparison also holds for both the metro and the nonmetro populations. The results are further broken down by whether children are present in the household and then further by metro/nonmetro residence. Except for a breakdown for the full sample of households with children in the gross-income eligible sample, there are no differences by American Indian status. While insignificant, in nonmetro areas for households without children participation rates are higher for non-American Indians. Another relevant comparison is for American Indians living in nonmetro and metro areas. There are no statistically significant differences between these groups.

Multivariate Results

The higher participation rates of American Indians may be due to other factors associated with higher rates of food stamp participation including lower homeownership rates, more children, and younger ages. (See Appendix Table 1 for details.) To see the effect of American Indian status after controlling for other factors, we display our estimations of equation (1) in Table 2. In the top panel we consider the case without any interaction terms. For the full sample under the gross-income test, controlling for other factors, American Indians have a 30.1 percent higher probability of receiving food stamps. This is slightly higher than when in Table 1 where American Indians have a 28.2 percent higher probability. For the gross income and asset eligible sample, the difference, controlling for other factors is 20.3 percent. When the sample is restricted to households with children and households without children, American Indians again have

higher food stamp participation rates, contrary to the results when other factors were not controlled for.

In the bottom panel the results for the inclusion of the interaction term are displayed. The variables reflecting American Indian status, nonmetro location, and their interactions are jointly statistically significant across all of the specifications. All else equal, in the sample of all gross-income eligible households, an American Indian household in a nonmetro area has a 41.3 percent probability of receiving food stamps, an American Indian household in a metro area has a 33.6 percent probability, an non-American Indian household in a nonmetro area has a 35.1 percent probability, and a 27.8 percent probability. The respective figures for households with children are 53.4, 47.2, 44.8, and 38.7 and for households without children, they are 27.8, 19.8, 25.1, and 17.6.

We now consider two alternative specifications using (a) an alternative definition of American Indian and (b) a more limited set of states. As discussed above, the definition of American Indian in the CPS changed in 2003. To see how this change may affect our results, we used the old definition of American Indian in 2002 through 2004 rather than the updated definition. The results are in Table 3. As seen in a comparison with Table 2, the change in definition had little effect on our results.

The distribution of American Indians in the United States is not equal across states. To see how this effects our results we limit our sample to states where more than three percent of the food stamp eligible population is American Indian. The resulting states are Alaska, Arizona, Colorado, Idaho, Kansas, Maine, Montana, North Dakota, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming. As seen in a comparison of Tables 2 and 4, for all households and for

households with children, the restriction to fewer states does not have much of an influence on the estimated coefficients. For households without children, however, in the gross and asset income eligible sample, the effect of being American Indian on food stamp participation is now insignificant. And in the results in the lower panel (with the interaction terms), the joint effects of American Indian status, nonmetro residence, and their interaction in the gross and asset income eligible sample is now insignificant.

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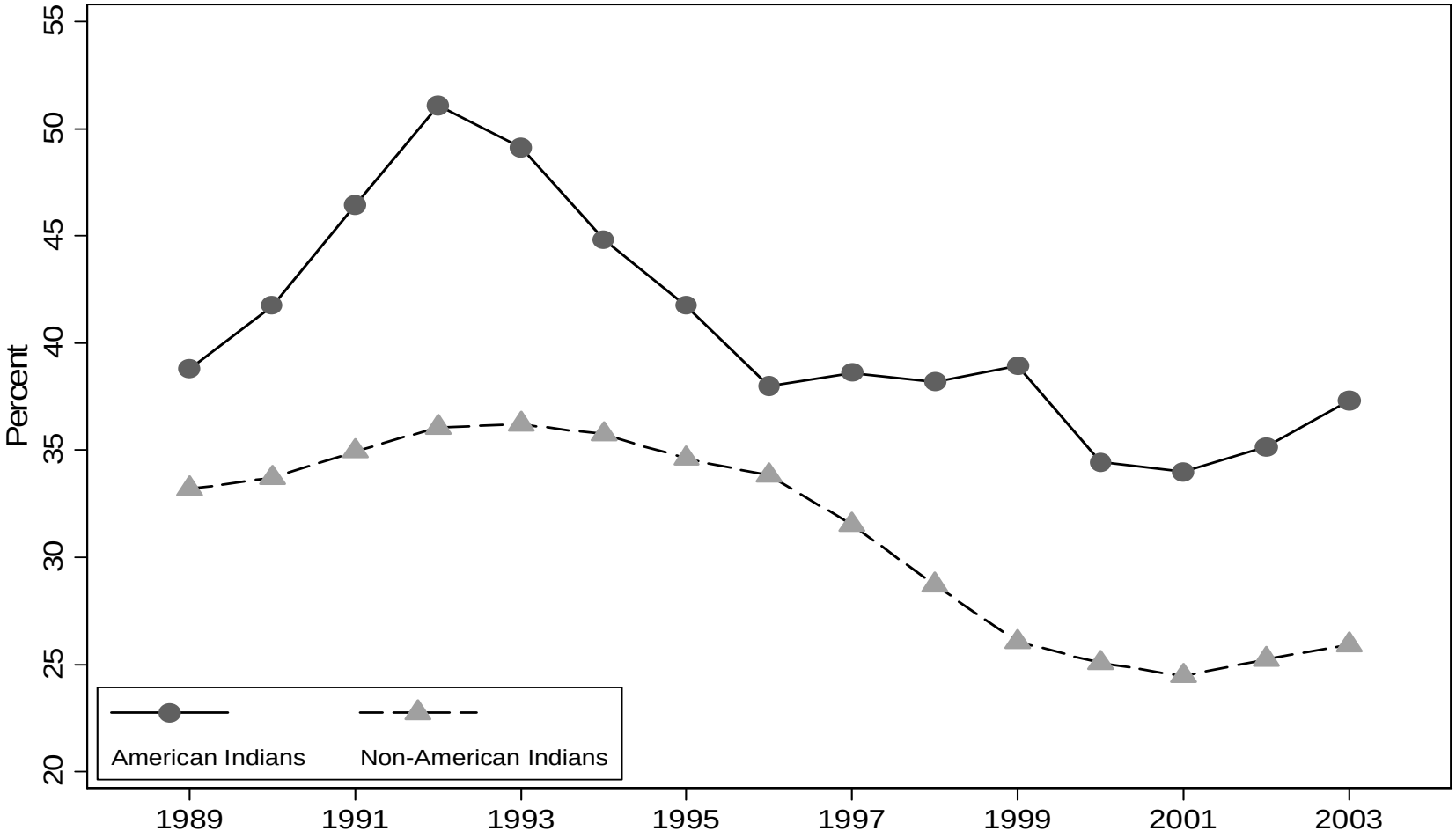

Figure 1. Food Stamp Participation Rates, 1989-2003: By American Indian Status

Table 1: Food Stamp Participation Rates by American Indian Status, 1988-2004

	American Indians	Non-American Indians	Difference (standard error)
	Gross Income Eligible		
All households	0.396	0.309	0.087 (0.014)**
In metro areas	0.390	0.307	0.082 (0.020)**
In nonmetro areas	0.404	0.314	0.090 (0.019)**
Households with children	0.531	0.489	0.042 (0.020)*
In metro areas	0.527	0.490	0.037 (0.029)
In nonmetro areas	0.536	0.487	0.050 (0.026)
Households without children	0.222	0.189	0.033 (0.017)
In metro areas	0.213	0.180	0.033 (0.024)
In nonmetro areas	0.233	0.212	0.021 (0.025)
	Gross Income and Asset Eligible		
All households	0.416	0.349	0.068 (0.016)**
In metro areas	0.424	0.345	0.079 (0.025)**
In nonmetro areas	0.408	0.361	0.047 (0.021)*
Households with children	0.548	0.511	0.033 (0.022)
In metro areas	0.547	0.511	0.036 (0.032)
In nonmetro areas	0.543	0.512	0.031 (0.028)
Households without children	0.230	0.222	0.006 (0.021)
In metro areas	0.237	0.212	0.025 (0.032)
In nonmetro areas	0.223	0.256	-0.033 (0.026)

Notes: Superscripts of * or ** are used if the p-value of the difference from zero is less than 0.05 or 0.01, respectively.

Table 2: The Effect of American Indian Status on Food Stamp Participation, 1988-2004

	All Households	Households with Children	Households without Children
	Without Nonmetro Interaction Term		
	Gross Income Eligible Households		
Households with American Indians	0.226	0.243	0.187
	(0.031)	(0.041)	(0.048)
	Gross Income and Asset Eligible Households		
Households with American Indians	0.165	0.191	0.122
	(0.032)	(0.043)	(0.050)
	With Nonmetro Interaction Term		
	Gross Income Eligible Households		
Households with American Indians	0.164	0.217	0.082
	(0.047)	(0.062)	(0.074)
Households in nonmetro areas	0.099	0.109	0.082
	(0.013)	(0.020)	(0.018)
Households with American Indians*	0.106	0.046	0.179
Households in nonmetro areas	(0.061)	(0.081)	(0.095)
	Gross Income and Asset Eligible Households		
Households with American Indians	0.136	0.181	0.067
	(0.049)	(0.064)	(0.079)
Households in nonmetro areas	0.108	0.114	0.095
	(0.014)	(0.020)	(0.019)
Households with American Indians*	0.050	0.017	0.092
Households in nonmetro areas	(0.064)	(0.084)	(0.101)

Note: Standard errors are in parentheses. The coefficients for the other variables in the model are suppressed. A list of these variables can be found in Appendix Table 1. Coefficients on year fixed effects are also suppressed.

Table 3: Effect of American Indian Status on Food Stamp Participation, Old Definition of American Indian in 2003-2005

	All Households	Households with Children	Households without Children
	Without Nonmetro Interaction Term		
	Gross Income Eligible Households		
Households with American Indians	0.231	0.252	0.180
	(0.034)	(0.044)	(0.054)
	Gross Income and Asset Eligible Households		
Households with American Indians	0.159	0.192	0.100
	(0.035)	(0.046)	(0.056)
	With Nonmetro Interaction Term		
	Gross Income Eligible Households		
Households with American Indians	0.164	0.217	0.082
	(0.047)	(0.062)	(0.074)
Households in nonmetro areas	0.099	0.109	0.082
	(0.013)	(0.020)	(0.018)
Households with American Indians*	0.106	0.046	0.179
Households in nonmetro areas	(0.061)	(0.081)	(0.095)
	Gross Income and Asset Eligible Households		
Households with American Indians	0.136	0.174	0.069
	(0.055)	(0.070)	(0.092)
Households in nonmetro areas	0.109	0.113	0.097
	(0.014)	(0.020)	(0.019)
Households with American Indians*	0.038	0.030	0.050
Households in nonmetro areas	(0.070)	(0.090)	(0.114)

Note: Standard errors are in parentheses. The coefficients for the other variables in the model are suppressed. A list of these variables can be found in Appendix Table 1. Coefficients on year fixed effects and state fixed effects are also suppressed.

Table 4: Effect of American Indian Status on Food Stamp Participation, Sample of States with High Proportions of American Indians

	All Households	Households with Children	Households without Children
	Without Nonmetro Interaction Term		
	Gross Income Eligible Households		
Households with American Indians	0.255	0.293	0.191
	(0.039)	(0.051)	(0.062)
	Gross Income and Asset Eligible Households		
Households with American Indians	0.172	0.225	0.099
	(0.041)	(0.053)	(0.065)
	With Nonmetro Interaction Term		
	Gross Income Eligible Households		
Households with American Indians	0.179	0.294	0.023
	(0.069)	(0.089)	(0.114)
Households in nonmetro areas	0.075	0.118	0.033
	(0.026)	(0.037)	(0.036)
Households with American Indians*	0.109	-0.001	0.239
Households in nonmetro areas	(0.082)	(0.107)	(0.133)
	Gross Income and Asset Eligible Households		
Households with American Indians	0.117	0.238	-0.043
	(0.072)	(0.092)	(0.121)
Households in nonmetro areas	0.069	0.114	0.022
	(0.027)	(0.039)	(0.039)
Households with American Indians*	0.080	-0.019	0.198
Households in nonmetro areas	(0.086)	(0.111)	(0.142)

Note: Standard errors are in parentheses. The coefficients for the other variables in the model are suppressed. A list of these variables can be found in Appendix Table 1. Coefficients on year fixed effects and state fixed effects are also suppressed. Residents in the following states are included in this model: Alaska, Arizona, Colorado, Idaho, Kansas, Maine, Montana, North Dakota, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming.

Appendix Table 1: Means and Standard Deviations of Selected Variables by American Indian Status

	American Indians	Non-American Indians	American Indians	Non-American Indians	American Indians	Non-American Indians
	All households		Households with children		Households without children	
	Gross Income Eligible					
Household income	9.688	8.489	11.644	11.019	7.165	6.801
	(0.180)	(0.039)	(0.280)	(0.066)	(0.153)	(0.029)
Homeowners	0.378	0.418	0 .318	0.304	0.456	0.494
Number of children	1.310	0.892	2.326	2.229	-	-
	(0.042)	(0.007)	(0.049)	(0.009)		
High school graduate	0.635	0.632	0.706	0.691	0.543	0.593
Age	44.513	50.591	35.713	35.552	55.865	60.622
	(0.504)	(0.103)	(0.449)	(0.070)	(0.756)	(0.117)
In nonmetro area	0.461	0.263	0.461	0.245	0.461	0.275
	Gross Income and Asset Eligible					
Household income	9.661	8.507	11.528	10.850	7.103	6.709
	(0.189)	(0.041)	(0.289)	(0.066)	(0.161)	(0.031)
Homeowners	0 .373	0.373	0.312	0.281	0.456	0.444
Number of children	1.349	0.971	2.333	2.235	-	-
	(0.044)	(0.008)	(0.051)	(0.009)		
High school graduate	0.626	0.614	0.695	0.676	0.533	0.565
Age	44.181	48.817	35.749	35.210	55.735	59.263
	(0.519)	(0.107)	(0.466)	(0.072)	(0.785)	(0.131)
In nonmetro area	0.466	0.259	0.461	0.243	0.473	0.271