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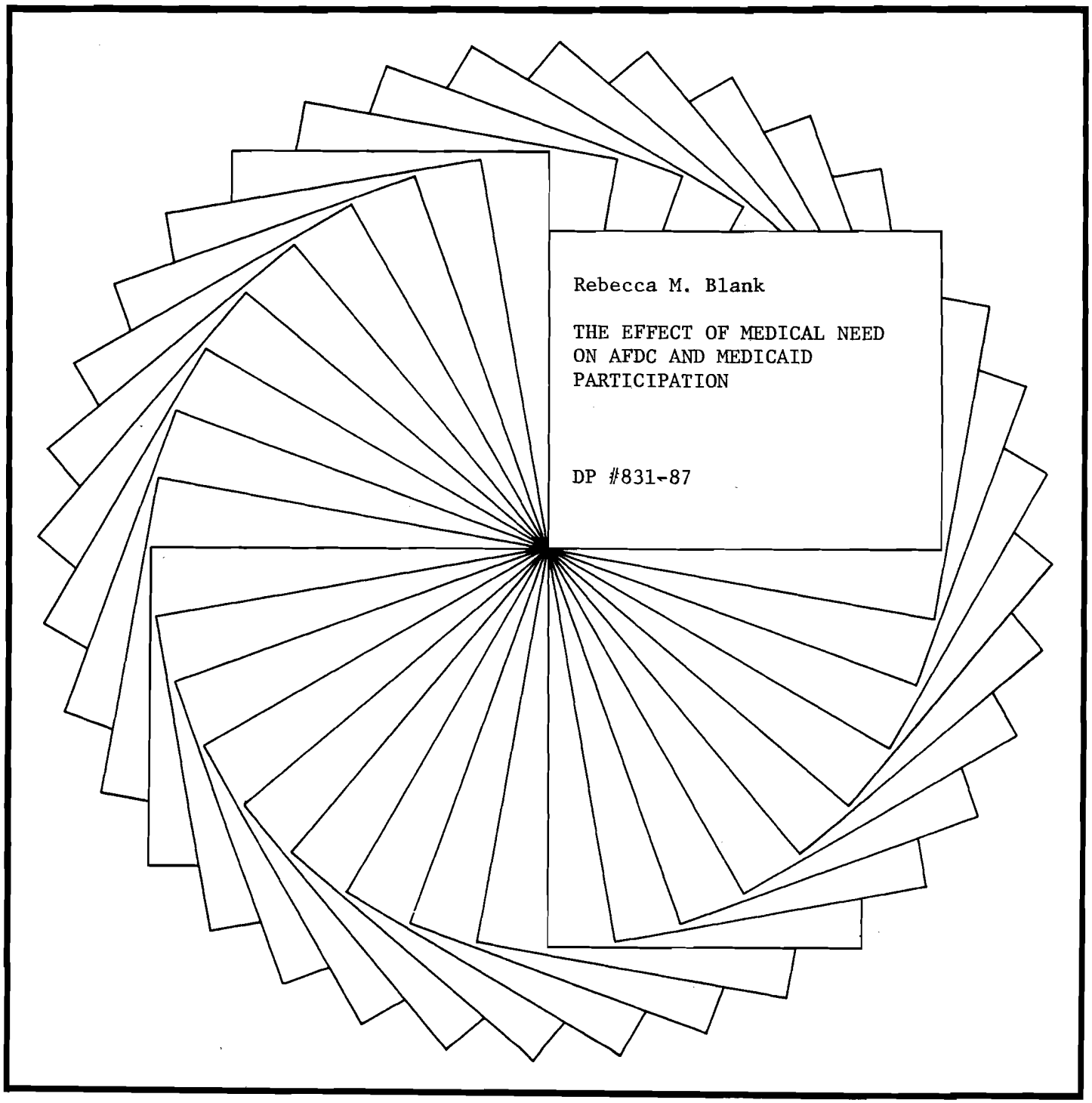

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The Effect of Medical Need on AFDC and Medicaid Participation

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Abstract

This paper investigates the need for medical insurance and the effect of Medicaid eligibility rules on the behavior of female-headed households with children, using 1980 data available from the National Medical Care Utilization and Expenditure Survey. Although insurance coverage improves access to medical services, many female-headed households are not covered by private insurance, implying that these women should find Medicaid eligibility desirable. In some states, Medicaid eligibility is only available for AFDC recipients. In other states the Medically Needy program allows some women to receive Medicaid without participating in other transfer programs. A multiple choice likelihood function is used to estimate the extent to which health problems and the parameters of the Medicaid program affect AFDC participation, labor market involvement, and Medicaid usage among those eligible for the Medically Needy program. It is clear that health problems significantly increase AFDC usage, even after controlling for their effects on labor market opportunities. Where it is available, the Medically Needy program is most likely to be used by households with greater personal health problems, or with small children. Most women who receive coverage from the Medically Needy program appear to go without insurance in states where it is not available.

The Effect of Medical Need on AFDC and Medicaid Participation

Medical insurance in the United States has traditionally been provided through private insurance companies. The primary exceptions to this are the two government health insurance programs, Medicare, which provides health care to participants in the Social Security system, and Medicaid, which covers certain low-income households. Medicaid is not, however, a comprehensive insurance scheme available to all low-income households. Coverage is guaranteed only to those households which are categorically eligible for the two major means-tested transfer programs, Aid to Families with Dependent Children (AFDC) or Supplementary Security Income (SSI). States can extend coverage to groups that participate in other programs (such as General Assistance.) In addition, over half the states offer a "Medically Needy" option, allowing households which are not eligible for public assistance programs to qualify for Medicaid under certain conditions.

This paper investigates the need for medical insurance and the effect of Medicaid eligibility rules on the behavior of female-headed households with children. This population is of particular concern because it is disproportionately poor (over one-third are below the poverty line), and because many of these households lack access to private medical insurance and rely on Medicaid. The first two sections of the paper present evidence on the extent and type of insurance coverage available to these households, as well as the effect of coverage on access to medical services.

Given a serious lack of availability of private medical insurance to this population, the eligibility criteria by which female-headed

households have access to Medicaid should be a crucial policy question. It is frequently suggested that many women remain on the AFDC program because it guarantees access to Medicaid. The third section of the paper presents the eligibility rules for Medicaid in more detail, and discusses a theoretical model of the impact of these rules on AFDC and labor market participation. The fourth section presents several econometric models which measure the joint effect of health needs on participation in AFDC, Medicaid, and the labor market. The availability of the Medically Needy program in only some states is used to estimate the demand for public insurance coverage, independent of AFDC eligibility. The fifth section discusses the estimation results from these models. Simulations are used to indicate the extent to which household health needs and AFDC and Medicaid program parameters affect AFDC and labor market participation. The final section of the paper summarizes the main points of the paper, and indicates where further research might be fruitful.

The data used throughout this paper are from the National Medical Care Utilization and Expenditure Survey (NMCUES),[1] which interviewed a random sample of households in the United States during calendar year 1980. Approximately 6,000 households participated in the study, representing over 17,000 individuals. This paper focuses on the 475 households that were female-headed throughout the year and contained at least one child under the age of 21. The particular advantage of NMCUES for this analysis is that it contains questions on medical need, insurance usage, and medical care utilization among all household members, as well as questions on labor market involvement, income sources and amounts. No

previous data set has provided as complete a combination of medical and income/earnings information, and consequently it has not previously been possible to investigate the relationship between medical needs, institutional eligibility rules for AFDC and Medicaid, and AFDC and labor market involvement.

I. Insurance Coverage among Female-Headed Households

In the United States, medical insurance is primarily available through one's employer as part of a fringe benefit package. However, because many women who head households work only part time or part year (or not at all), many of them do not have a complete set of fringe benefits available through their job. This employment fact, which is closely related to the disproportionately low incomes of many female-headed households, leads to a serious gap in the availability of private medical insurance to many women and their children.[2] Table 1 presents the extent to which female-headed households are covered by insurance.[3]

Of the entire sample, less than half (47%) had private insurance available to them throughout 1980. Another 11% were covered by private insurance for part of the year. More than one-third of the households relied on Medicaid for all or part of the year. While only 7% were uninsured for the entire year, almost one-quarter (24%) were uninsured for at least part of the year.

Not surprisingly, the bulk of the uninsured are low-income households. Thirty percent of all those below 125% of the poverty line were uninsured for all or part of the year. Only 10% of this income group had private insurance year-round, and 54% relied on Medicaid all year.

Table 1

Availability of Insurance among Female-Headed Households

		Insured Year Round			Insured Part of Year		
	Total	Private All Year	Medicaid All Year	Mix of Private & Medicaid	Private Part Year	Medicaid Part Year	Uninsured All Year
Total Households							
Number	475	225	118	16	54	27	35
Percentage	100%	47%	25%	3%	11%	6%	7%
By Poverty Status							
<125% of poverty line							
Number	184	19	100	11	20	18	16
Percentage	39%	10%	54%	6%	11%	10%	9%
>125% of poverty line							
Number	291	206	18	5	34	9	19
Percentage	61%	71%	6%	2%	12%	3%	7%
By Household Income[a]							
<$10,000							
Number	207	34	101	11	24	17	20
Percentage	44%	16%	49%	5%	12%	8%	10%
$10-20,000							
Number	168	108	13	4	22	9	12
Percentage	35%	64%	8%	2%	13%	5%	7%
$20-30,000							
Number	63	51	4	1	5	0	2
Percentage	13%	81%	6%	2%	8%		3%
>$30,000							
Number	37	32	0	0	3	1	1
Percentage	8%	86%			8%	3%	3%
By Employment Status							
Full-Time, Full-Year Worker							
Number	169	140	1	1	14	3	10
Percentage	35%	83%	1%	1%	8%	2%	6%

- Table Continued -

Table 1, Continued

	Total	Insured Year Round			Insured Part of Year		
		Private All Year	Medicaid All Year	Mix of Private & Medicaid	Private Part Year	Medicaid Part Year	Uninsured All Year
Full-Time, Part-Year Worker							
Number	87	39	8	9	19	4	8
Percentage	18%	45%	9%	10%	22%	5%	9%
Part-Time Worker							
Number	81	25	24	4	13	8	7
Percentage	17%	30%	30%	5%	16%	10%	9%
Unemployed All Year							
Number	40	2	28	1	0	7	2
Percentage	8%	5%	70%	2%		18%	5%
Not in Labor Force							
Number	98	19	57	1	8	5	8
Percentage	21%	19%	58%	1%	8%	5%	8%

Source: National Medical Care Utilization & Expenditure Survey, 1980. All female-headed households in the survey with a child under 22 are included, except those receiving Medicare.

[a]1980 dollars.

However, even among women in the upper-income categories, a significant number (more than 10%) were not insured for the full year.

The relationship between employment status and insurance is of particular interest. Over one-third of the sample worked full time, full year, and while the majority of these women had year-round private insurance, still a significant number, 17%, did not. And less than half of part-year workers and less than a third of part-time workers had full-year private insurance.

It is clear that a large private insurance "gap" exists among female-headed households. The assumption that they will be able to receive insurance through their contact with the labor market is inappropriate for the many women who are not full-time, full-year workers, or those who are unemployed or out of the labor force altogether. The Medicaid program partially fills this gap, providing a high percentage of low-income women with at least part-year insurance coverage. However, quite a few households within this population remain uninsured for some period during the year.

II. Insurance Coverage and Medical Care Utilization

Lack of insurance coverage by itself may not indicate lack of access to medical services. People without insurance may be healthier than those with insurance. Or they may be able to acquire medical care through indigent-care services. However, most research indicates that insurance coverage increases access to medical care. A significant increase over the last 20 years in the extent to which low income households have access to medical services (and a concomitant improvement in

their health status, as measured by a wide variety of variables) has been directly linked to the creation and expansion of the Medicaid program.[4]

Table 2 tabulates usage rates by insurance coverage for six categories of medical services within the sample of female-headed households.[5] Some of these services are mandatorily covered by Medicaid in all states; others are optional, and are covered only by a few states. It is clear that both the propensity to use any of these services and the extent of usage is much higher among the insured than among the uninsured. In addition, those insured by Medicaid are more likely to use these services (except dental) than the privately insured, and to use them more often.

However, Table 2 makes no adjustment for differences in household composition or health needs between the uninsured and those insured privately or by Medicaid. Table 3 presents the results of six multivariate regressions, where the dependent variable is the number of times a household uses a particular medical service over the year.[6] The independent variables include a set of controls for household characteristics (not reported here), several measures of health status,[7] and dummy variables for those who are not insured or are insured by Medicaid. The coefficients on the dummy variables show the use of these medical services relative to the omitted (private insurance) category.

Table 3 clearly indicates that health restrictions--both for the head and for other household members--increase the demand for medical services. Restricted activity days provide a general measure of the sickness/wellness of the household. Activity limits are a measure of more serious functional disabilities. In addition, perceived health

Table 2

Use of Medical Services by Insurance Type and Availability among All Members of Female-Headed Households[a]

	Medicaid Recipients		Private Insurance Recipients	Uninsured All Year
	Cost Covered by State	Cost Not Covered by State		
Doctor Visits				
No. persons visiting	362	b	532	73
% persons visiting	64%	b	62%	44%
Average visits per person visiting	4.6	b	3.7	3.0
Emergency Room Visits				
No. persons visiting	168	12	215	32
% persons visiting	34%	19%	25%	19%
Average visits per person visiting	1.8	1.3	1.4	1.6
Other Medical Visits[b]				
No. persons visiting	128	b	189	21
% persons visiting	23%		22%	13%
Average visits per person visiting	4.6		4.5%	2.9
Nights in Hospital				
No. persons in hospital	81	b	76	6
% persons in hospital	14%		9%	4%
Average nights per person in hospital	9.4		7.3	5.7

- Table continued -

Table 2, Continued

	Medicaid Recipients		Private Insurance Recipients	Uninsured All Year
	Cost Covered by State	Cost Not Covered by State		
Dentist Visits				
No. persons visiting	195	13	379	38
% persons visiting	37%	34%	44%	23%
Average visits per person visiting	2.2	2.5	2.9	2.4
Prescribed Medicines				
No. persons w/prescription medicines	346	4	466	59
% persons w/prescription medicines	63%	31%	55%	36%
Average prescription medicines per user	6.6	12.5	6.0	5.4

[a]Total sample is 1566 observations, including both heads and other household members.

[b]All states are required by federal law to cover physician services, inpatient and outpatient hospital services, laboratory and X-ray services, dental care for those under age 21 and family planning services (unless these relate to specific, uncovered physical problems.)

[c]Includes all visits to hospitals or doctors' offices where no doctor is seen.

Table 3

Effect of Insurance Coverage and Health Needs
on Household Medical Care

(OLS Regressions[a]; Standard Errors in Parentheses)

	Doctor Visits	Hospital Stays	Emergency Room Visits	Other Medical Visits	Dentist Visits	Number of Prescribed Medicines
Insurance Coverage						
No insurance[b]	-.875*	-.737*	-.036	.232	-.385*	-1.621*
	(.440)	(.508)	(.118)	(.628)	(.262)	(.959)
Medicaid insurance[b]	.404*	-.577*	.163*	.355	-.023	.370
	(.292)	(.337)	(.079)	(.417)	(.174)	(.637)
Health Characteristics						
Restricted activity days of head[c]	.014*	.011*	.004*	-.004	.002	.047*
	(.003)	(.004)	(.001)	(.005)	(.002)	(.007)
Restricted activity days of other members[c]	.007*	.026*	.004*	.015*	.001	.003
	(.004)	(.004)	(.001)	(.005)	(.002)	(.008)
Activity limits on head (0/1 variable)	.684*	.491*	.082*	.195	.048	1.574*
	(.210)	(.242)	(.056)	(.299)	(.125)	(.457)
Perceived health status[d]	1.208*	.633*	.154*	1.293*	.084	1.562*
	(.294)	(.339)	(.079)	(.419)	(.175)	(.640)
R^2	.250	.161	.245	.087	.105	.283

*Significant at 10% level or higher.

[a]Regressions also include controls for age and education of head, household size, number of preschool children, race, household income and a constant. Coefficients unreported here but available from author upon request.

[b]Coefficients indicate the effect relative to the omitted (private insurance) category.

[c]Includes bed days, reduced-activity days, and any additional work/school loss days due to illness.

[d]Mean of all household members' perceived health status (1 = excellent, 4 = poor).

status clearly has a measurable effect on medical care utilization, even after controlling for objective measures of health need.

The lack of insurance significantly decreases a household's propensity to use medical services in all categories except the residual "other medical visits"--which are all visits to a medical care facility (excluding emergency room visits) in which a doctor is not seen--and emergency room visits. This may indicate the extent to which noninsured individuals utilize emergency rooms or nontraditional sources of medical care when they do seek it out. Even after controlling for health status and household characteristics, the regressions in Table 3 indicate that households insured by Medicaid are more likely to visit the doctor and the emergency room than are privately insured households, and less likely to stay in the hospital. This result could reflect differences in the insurance structure of Medicaid versus most private plans (for instance, covered Medicaid expenses have no deductible to be paid by the patient, unlike most private insurance schemes), or it could be due to some further differences between Medicaid and privately insured households which we have not adequately controlled for. However, the primary message from Tables 2 and 3 is that insurance makes a difference in the medical care which a household utilizes. With Medicaid, in fact, it may be easier to have access to certain medical services than with private insurance. Given that many women who head households do not have access to private insurance, and given that Medicaid seems an effective way of providing equivalent quantities of medical care, one would expect that many of the women who do not have access to private insurance would seek to participate in the Medicaid program.

III. Modeling the Impact of Medicaid Eligibility Rules

As in many U.S. transfer programs, Medicaid eligibility is based on a combination of federally mandated requirements and optional state extensions.[8] Under federal mandate, the Medicaid program must be available to all households that are judged "categorically eligible," meaning that the household has already been certified to receive either AFDC or SSI. The federal government also requires that households which leave AFDC through income or earnings increases (thus excluding those women who marry) must be allowed to maintain their Medicaid eligibility for four months after AFDC is terminated. States have some leeway in defining who is included in the "categorically eligible" definition (for instance, some states exclude the male-headed households on the AFDC-Unemployed Parent program.) The extent of Medicaid coverage may also vary among states. While there are eight medical categories that all states must cover,[9] there is a long list of optional expenses which states may or may not choose to cover, such as emergency room costs, prescribed medicines, dental care for adults, physical or occupational therapy, etc. States are not allowed to charge copayments or deductibles on any of the eight mandated categories, but can place such charges on optional services.

In 20 states in 1980 only the categorically eligible could receive Medicaid. Most unmarried women who were not on the AFDC program had no access to publicly funded medical insurance. However, 29 states and the District of Columbia participated in the optional Medically Needy program.[10] Under this program, households not eligible for AFDC might still qualify for Medicaid. The state establishes a "net protected

income" level (which under federal law could not exceed 133.3% of the maximum AFDC assistance payment) and a "spenddown" period (six months or less). A household is considered eligible for Medicaid under the Medically Needy program if its income is below the net protected income level or if it qualifies for spenddown--i.e., its expected income minus unpaid medical bills is below the protected income level over the spenddown period.[11] The household is expected to pay this difference (something like a deductible), but all medical expenses that exceed this difference are covered by Medicaid. Medicaid eligibility can only be certified for the spenddown period and must be recertified if continued medical expenses occur. There are also asset limits for the Medically Needy program, which makes it very difficult for middle-income families to qualify for Medicaid, even when faced with large medical bills.

Appendix Table A presents a list of the states, indicates which have Medically Needy programs, and shows the AFDC maximum payment for a four-person family in 1980, as well as the net protected income level and the spenddown period. Note that although states may set Medically Needy protected income levels at up to 133.3% of the AFDC maximum, few of them actually go this high.[12] In fact, in eight states the protected income level is below the maximum AFDC payment level.

The impact of Medicaid on the budget line of a household in a state without the Medically Needy program is indicated in Figure 1.[13] In this case, the household may receive AFDC and Medicaid together until the break-even point B, at which the household has earnings which disqualify it from AFDC eligibility. At point B, the AFDC grant is reduced to zero and Medicaid insurance is lost. The loss of Medicaid insurance typically

creates a notch in the budget line. Standard economic analysis indicates that some individuals who might otherwise have remained off AFDC and are located above the break-even point will be induced by the Medicaid notch to remain on AFDC. The utility curves of such an individual are pictured in Figure 1.

Realize that the size of the Medicaid notch depends upon the availability of subsidized private insurance. If an individual has private insurance available through her employment which is as extensive as Medicaid in coverage, then there is no Medicaid notch. However, if private insurance is not available, or is not fully subsidized, and hence must be purchased, or if its coverage is less extensive than Medicaid's, then the notch will exist.[14] A more likely case is that some partially subsidized private insurance may be available to a worker, but only if her hours of work are very large. Thus the budget set may appear as shown in Figure 2, with a Medicaid notch at low hours of work, and a "full-time" notch at high hours of work, where employer-subsidized private insurance becomes available. In this situation, some individuals will decrease their hours of work in order to be eligible for Medicaid, while other workers will increase their hours of work in order to take advantage of employer health insurance. Table 1 indicates that the best predictor of private insurance availability is full-time, full-year work. Thus, I assume that by explicitly modeling hours of work in the econometric model below, I am controlling for access to private insurance.

The situation in Medically Needy states (the term used in this paper for states that offer the Medically Needy program) is somewhat different, as Figure 3 indicates. If the protected income level is above the AFDC

FIGURE 1.

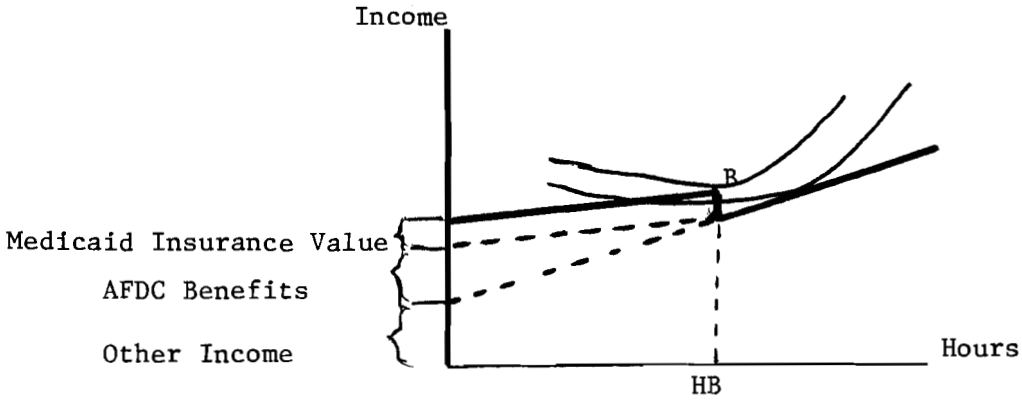


FIGURE 2.

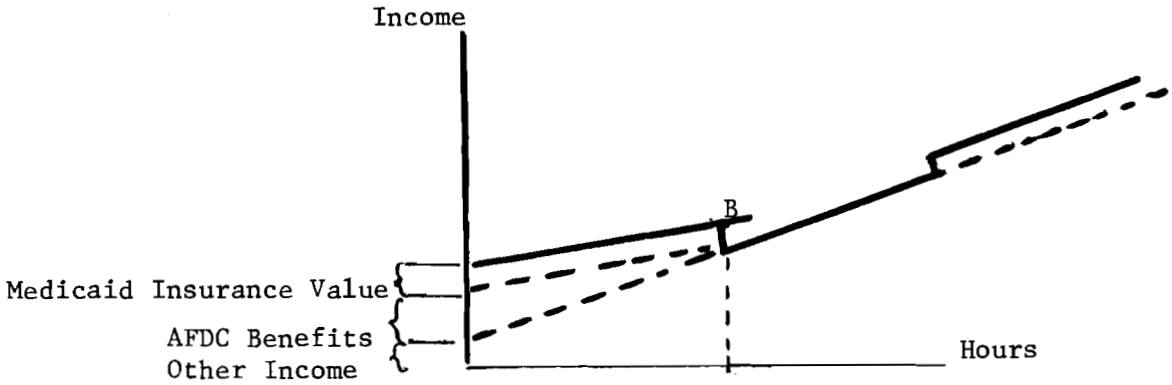
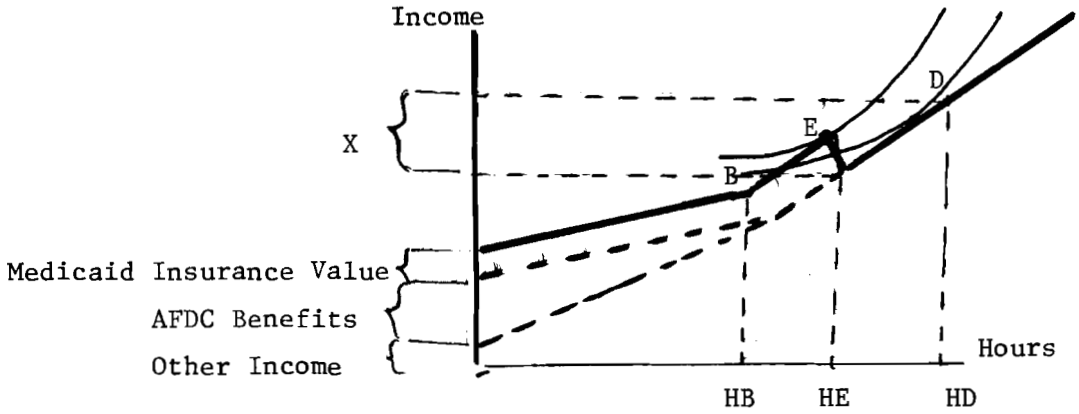


FIGURE 3.



break-even level, then the Medicaid notch occurs somewhere above the break-even point. It is clear that some individuals who would be participating in AFDC in the absence of the Medically Needy program will leave AFDC and locate somewhere between HB and HE hours of work, increasing hours of work and receiving only Medicaid. On the other hand, some individuals will clearly decrease their hours of work to HE or below to take advantage of the Medicaid eligibility, as the utility curves pictured here indicate. Note, however, that in the short run an individual may be located at point D and still have access to Medicaid. If she has medical bills in excess of X, she can pay X and essentially relocate to point E, with the rest of the bills covered by Medicaid. If these bills were expected to continue for some time, one might expect the individual to reduce hours of work and permanently locate at point E or below. But if the medical bills are temporary and there are labor market reasons to remain continuously employed at HD hours, it could make sense in the short run to continue to work HD hours. Thus, depending on extent of medical need (and the ease with which access may be gained to the Medically Needy program) one might see households with work hours well above HE that are temporarily receiving Medicaid through the Medically Needy program.

Table 4 presents evidence on the extent to which women in Medically Needy and non-Medically Needy states differ in their insurance coverage. It is clear that in states with the Medically Needy program, a higher percentage of households receive Medicaid all or part of the year, and a much lower percentage are uninsured. This is particularly notable among households below 125% of the poverty line, where only 4% of those in

Table 4

Effect of Medically Needy Programs on Insurance Availability among Female-Headed Households

	Total	Insured Year Round			Insured Part of Year		
		Private All Year	Medicaid All Year	Mix of Private & Medicaid	Private Part Year	Medicaid Part Year	Uninsured All Year
In States with Medically Needy Programs							
Total							
Number	325	148	87	13	33	25	19
Percentage		46%	27%	4%	10%	8%	6%
By Poverty Status							
<125% of poverty line							
Number	128	11	75	8	13	16	5
Percentage		9%	59%	6%	10%	12%	4%
>125% of poverty line							
Number	197	137	12	5	20	9	14
Percentage		70%	6%	3%	10%	5%	7%
In States without Medically Needy Programs							
Total							
Number	150	77	31	3	21	2	16
Percentage		51%	21%	2%	14%	1%	11%
By Poverty Status							
<125% of poverty line							
Number	56	8	25	3	7	2	11
Percentage		14%	45%	5%	12%	4%	20%
>125% of poverty line							
Number	94	69	6	0	14	0	5
Percentage		73%	6%		15%		5%

Medically Needy states report being uninsured all year, while 20% in non-Medically Needy states report this status. Thus, the raw data in Table 4 are certainly consistent with the theory that the Medically Needy program induces better insurance coverage.

Table 5 looks at Medicaid receipt among AFDC and non-AFDC households. Even in states that do not have a Medically Needy program, there are a few households that report receiving Medicaid without AFDC. These are likely to be households that are participating in the four-month Medicaid extension available to a woman who leaves AFDC. (Unfortunately, I cannot separate these people from those on the Medically Needy program in Medically Needy states. The fact that there are so few of them visible in "non-Medically Needy states" indicates that this should not be a serious source of bias in the data.) The data in Table 5 have two interesting aspects. First, caseloads are not lower in the Medically Needy states. Twenty-seven percent of the households (88/325) are on AFDC in these states, while only 21% are on AFDC in the non-Medically Needy states. This is not consistent with the hypothesis that the Medically Needy program will allow some women to leave AFDC. We will come back to this issue below. Second, among the non-AFDC recipients, it is clear that women in Medically Needy states are much more likely to be insured, primarily because they make use of Medicaid to fill some of the private insurance gap. Only 8% of the non-AFDC recipients are uninsured year round in Medically Needy states, while 13% are uninsured in non-Medically Needy states. This is evidence that the Medically Needy program provides medical insurance assistance to women who would otherwise have no insurance. Note that this is not consistent with a theory

Table 5

AFDC Recipiency, Insurance Availability, and the
Effect of State Medically Needy Programs

	States with Medically Needy Program					States without Medically Needy Program				
	Total	Medicaid Only, Part and Full Year	Mix of Private and Medicaid	Private Only, Part and Full Year	Uninsured All Year	Total	Medicaid Only, Part and Full Year	Mix of Private and Medicaid	Private Only, Part and Full Year	Uninsured All Year
Heads										
AFDC Recipients										
Number	88	68	8	12	0	31	26	2	3	0
Percentage		77%	9%	14%			84%	6%	10%	
Non-AFDC Recipients										
Number	237	44	5	169	19	119	7	1	95	16
Percentage		19%	2%	71%	8%		6%	1%	80%	13%

that would claim that women who really need Medicaid will go on AFDC if the Medically Needy program is not available. Instead, the counterparts of those who receive Medicaid through the Medically Needy program appear to go uninsured in non-Medically Needy states.

There is almost no empirical literature on the impact of Medicaid's program parameters and eligibility requirements on AFDC participation. As noted above, this is partly because no adequate data set has been available. Two recent papers, Mauskopf, Rodgers and Dobson [1985] and McDevitt and Buczko [1985], are the only ones that have treated these issues. The first paper analyzes aggregate state AFDC caseloads and expenditures as a function of various AFDC and Medicaid program parameters and coverage indicators. Some differences in Medicaid coverage seem to affect AFDC caseloads. The presence of a Medically Needy program was insignificant in several equations, but had a positive effect on state AFDC expenditures, which is not the expected sign. The second paper looks at use of medical services in individual microdata and finds that individuals in states with more limited coverage provisions make less use of uncovered services, which is consistent with the results in Table 2, above. While these two papers clearly indicate that the structure of the Medicaid program can affect behavior, there is a need for more extensive empirical analysis of the effect of Medicaid on individual AFDC and labor market decisions.

IV. Estimation Strategies

The primary estimation problem in trying to untangle the effect of medical need on AFDC participation is that AFDC eligibility automatically

implies Medicaid eligibility. In non-Medically Needy states, it is impossible to separate the demand for Medicaid from the demand for AFDC. In Medically Needy states, one can estimate a separate demand equation for medical insurance only among those who are not already on the AFDC program. Thus, rather than trying to separate the demand for medical insurance from the demand for AFDC, I will focus on estimating the extent to which the need for medical insurance affects AFDC participation. This means variables must be available which measure the size of the Medicaid notch for each household.

Calculating the value of an in-kind insurance transfer is a difficult empirical problem which is extensively discussed in Smeeding and Moon [1980] and Smeeding [1982]. The generally accepted method is to calculate the insurance value to the family. Applying the methodology described by Smeeding [1982], the Department of Health and Human Services has calculated an estimate of the annual insurance value of Medicaid to disabled and nondisabled adults and children in each state in 1980.[15] Using these numbers, I estimate a mean state-specific value of Medicaid for each household as the sum of the insurance values reported in their state for an adult (using reported disability status) and three children.[16] This number (call it V) provides a first-pass estimate of the insurance value of Medicaid for each household and accounts for some of the differences in state Medicaid coverage, but it ignores the household-specific information we have on medical needs.

If V* is taken to represent the true insurance value of Medicaid to a particular household, we can write

$$(1) \qquad V^* = f(V, X, M),$$

where V is the state-specific mean value for a family of four calculated as discussed above, X is a vector of household demographic characteristics, and M is a vector of household health status measures. If all variables (V, X, and M) are included in an AFDC participation equation, they should control for the effect of Medicaid availability on AFDC participation. Of course, one problem is that the coefficients for X and M will reflect both their effect on the value of medical insurance and the demand for Medicaid, as well as any additional effects they may have on AFDC participation. (More children and greater medical problems would be expected to increase the probability of AFDC participation even if Medicaid was not available to AFDC recipients.) More will be said about this problem below.

Assume that individuals make utility-maximizing choices. Then a woman will choose to participate in AFDC (and, automatically, in Medicaid) if her utility on AFDC, U_A, is greater than her utility in the absence of AFDC, U_{NA}. This difference in utilities can be characterized as

$$(2) \qquad P^* = U_A - U_{NA},$$
$$= X_A\beta_A + S_A\alpha_A + M_A\delta_A + \varepsilon_A,$$
$$= Z_A\pi_A + \varepsilon_A,$$

where X_A is a vector of household characteristics which enter the utility function and affect preferences, S_A is a vector of the institutional parameters which determine transfer benefits (including state-specific measures of AFDC and Food Stamp payment levels, as well as V, the mean state Medicaid value), and M_A is a vector describing the health needs of

the household. These health needs both determine the value of medical insurance to the household (determining the size of the Medicaid notch) and directly affect AFDC participation exclusive of their effect on medical need (households with more health problems will probably have lower earnings ability). While the actual value of the continuous variable P* cannot be observed, we can observe a dichotomous variable, P, where

(3) $P = 1$ if $P^* > 0$ (or $\varepsilon_A > -Z_A\pi_A$),

and $P = 0$ otherwise.

Using the discrete variable P, equation (2) can be estimated by standard probit techniques.

The parameters of equation (2) will provide a first-pass estimate of how health needs affect AFDC participation decisions. The addition of a dummy variable for households residing in Medically Needy states will also provide an initial look at how the Medically Needy program affects AFDC participation.

Equation (2) estimates the AFDC participation decision alone, ignoring the interaction between AFDC recipiency and other behavioral choices. In particular, the kinks in the budget line induced by the institutional structure of the AFDC program create a situation in which labor market and AFDC participation decisions are made jointly. However, realize that one wants to look at more than a dichotomous labor market participation decision and investigate the extent of labor market involvement. We noted above that many women who participate in the labor market still do not have private insurance; only as hours of work approach full time does medical insurance coverage become highly

probable. In addition, the effect of AFDC on the margin is as likely to be a decrease in hours (but continued labor market participation) as a dichotomous change in labor market participation. Thus, I propose to jointly estimate equation (2) and an explicit equation for hours of work,

$$(4) \quad H = X_H\beta_H + T_H\tau_H + M_H\delta_H + \varepsilon_H$$
$$= Z_H\pi_H + \varepsilon_H.$$

H is a measure of weekly hours of work, truncated below zero. X_H is a vector of household characteristics affecting hours of work; T_H is a vector of labor demand factors; and M_H is a vector of variables measuring the health status of the household.[17]

Underlying the choice of hours is a utility-maximizing decision. It has been noted that a linear demand function for hours is not necessarily consistent with a linear equation describing AFDC participation. An alternative approach to modeling utility maximization decisions is to explicitly choose a functional form for utility, and estimate the tangency point between it and an explicitly described budget line with the appropriate kinks and notches. There are serious problems with implementing this structural estimation strategy. The most important is that the size of the Medicaid subsidy is virtually impossible to measure accurately. I use a reduced-form specification of the underlying determinants of Medicaid, but am unable to make a good estimate of the dollar value of Medicaid insurance to each household. Without a good measure of the size of the notch, explicit budget segments are difficult to model. Second, these strategies are often very difficult to empirically estimate in the presence of particularly "kinked" budget sets.[18] Finally, this

approach of course depends upon the functional form chosen for the utility function. Functional forms are typically picked for empirical convenience, and it is not clear that the results will be any less ad hoc than those emerging from more reduced-form estimates. Because of these problems, this paper will estimate a series of reduced-form equations, and will not try to explicitly model the utility functions and the budget lines. The variables which determine utility maximization, as well as the institutional parameters which determine the budget lines, will be included in the equations estimated, but there will be no attempt to estimate a precise structural form for the utility-maximization decision.

Joint estimation of equations (2) and (4) requires maximizing a four-part likelihood function for each individual,

$$(5)\quad L = \Pr[\varepsilon_A > -Z_A\pi_A,\ \varepsilon_H \leq -Z_H\pi_H/\sigma_H] + \Pr[\varepsilon_A \leq -Z_A\pi_A,\ \varepsilon_H = (H-Z_H\pi_H)/\sigma_H]$$
$$+ \Pr[\varepsilon_A > -Z_A\pi_A,\ \varepsilon_H = (H-Z_H\pi_H)/\sigma_H] + \Pr[\varepsilon_A \leq -Z_A\pi_A,\ \varepsilon_H \leq -Z_H\pi_H/\sigma_H],$$

where σ_H is the standard error of H.

In non-Medically Needy states, the likelihood function in equation (5) provides the best estimate one can make of the joint effect of medical need on hours and AFDC participation. However, in states where the Medically Needy program is available, equation (5) is not complete. It is possible in these states to be off AFDC and still to receive Medicaid. For individuals who are recipients of AFDC, the same indeterminancy occurs as discussed above: since they automatically receive both AFDC and Medicaid, we cannot separate the effect of Medicaid on AFDC participation. However, individuals who are not AFDC recipients have

additional choices in Medically Needy states: they can choose how many hours they will work, as well as choosing whether to use Medicaid. Thus, individuals who are off AFDC not only choose hours of work, but also compare their utility with and without Medicaid at each possible hours choice. Presumably individuals who find more hours attractive will be less likely to choose Medicaid, since they will be more likely to have alternative sources for medical insurance. This means that there is an additional choice equation, which can be written as

$$(6) \qquad N^* = X_N\beta_N + S_N\alpha_N + M_N\delta_N + \varepsilon_N$$
$$= Z_N\pi_N + \varepsilon_N,$$

where N^* is an unobservable measure of the utility comparison between participation and nonparticipation in the Medicaid program, X_N is a vector of household characteristics affecting the need for Medicaid, S_N is a vector of institutional parameters that affect eligibility for the Medicaid program, and M_N is a vector of health characteristics of the household. While N^* cannot be observed, we can observe the dichotomous variable N, where

$$(7) \qquad N = 1 \text{ if } N^* > 0 \text{ (or } \varepsilon_N > -Z_N\pi_N),$$
and $N = 0$ otherwise.

In Medically Needy states, for individuals observed to participate in AFDC, only a two-way choice is estimable (no matter what the value of Medicaid to them, they receive it automatically). Thus the likelihood function for AFDC recipients is

$$(8a) \quad L = \Pr[\varepsilon_A > -Z_A\pi_A,\ \varepsilon_H \leq -Z_H\pi_H/\sigma_H] + \Pr[\varepsilon_A > -Z_A\pi_A,\ \varepsilon_H = (H - Z_H\pi_H)/\sigma_H].$$

However, non-AFDC recipients in Medically Needy states face a four-part likelihood function:

$$(8b) \quad L = \Pr[\varepsilon_A \leq -Z_A\pi_A,\ \varepsilon_N \leq -Z_N\pi_N,\ \varepsilon_H \leq -Z_H\pi_H/\sigma_H] + \Pr[\varepsilon_A \leq -Z_A\pi_A,\ \varepsilon_N \leq -Z_N\pi_N,\ \varepsilon_H = (H - Z_H\pi_H)/\sigma_H] + \Pr[\varepsilon_A \leq -Z_A\pi_A,\ \varepsilon_N > -Z_N\pi_N,\ \varepsilon_H \leq -Z_H\pi_H/\sigma_H] + \Pr[\varepsilon_A \leq -Z_A\pi_A,\ \varepsilon_N > -Z_N\pi_N,\ \varepsilon_H = (H - Z_H\pi_H)/\sigma_H].$$

Summing the likelihood function for individuals in non-Medically Needy states (equation 5), for individuals on AFDC in Medically Needy states (equation 8a), and for individuals off AFDC in Medically Needy States (equation 8b) across all individuals and maximizing will produce estimates of π_A, π_N, π_H, σ_H, θ_{AH}, the correlation coefficient between ε_A and ε_H, and θ_{NH}, the correlation coefficient between ε_N and ε_H. (No correlation between ε_A and ε_N can be estimated, since AFDC is never observed without Medicaid.)[19]

While this estimation technique does provide efficient estimates of the joint choice between AFDC, hours of work, and Medically Needy participation, it does not allow one to estimate the effect of health problems on AFDC independent of their effect on hours of work. The coefficients on the health variables in the AFDC participation equation (δ_A) combine two effects: Health problems will increase the insurance value of Medicaid for the household. While this is the effect we are most interested in, it is confounded by the fact that health problems will

also constrain the household head in the hours that she is able to work, either by limits on her own health or limits on her children's health that require her to spend more time at home. To estimate the effect of health on AFDC participation, independent of its effect on a woman's labor market and earning power, one wants to include hours of work as a control variable in the AFDC participation equation. However, if AFDC and hours of work are simultaneously determined, this will lead to an overestimate of the coefficient on hours in the AFDC equation.

Despite this problem, because of my interest in exploring the effect of health problems on AFDC participation, I propose a final set of estimates in which only AFDC and Medically Needy participation are estimated jointly. Rather than include hours of work as a separate simultaneous choice variable, I include it as an independent variable in the equations for AFDC and Medically Needy participation. Thus, I estimate the equations

$$(2') \qquad P^* = Z_A\pi_A + \Omega_A H + \mu_A \qquad \text{and}$$

$$(6') \qquad N^* = Z_N\pi_N + \Omega_N H + \mu_N.$$

As before, for individuals in non-Medically Needy states, one can only estimate the likelihood function

$$(9a) \qquad L = \Pr[\mu_A > -(Z_A\pi_A + \Omega_A H)] + \Pr[\mu_A \leq -(Z_A\pi_A + \Omega_A H)].$$

For individuals in Medically Needy states, one can estimate

$$(9b) \qquad L = \Pr[\mu_A > -(Z_A\pi_A + \Omega_A H)] + \Pr[\mu_A \leq -(Z_A\pi_A + \Omega_A H),$$
$$\mu_N > -(Z_N\pi_N + \Omega_N H)] + \Pr[\mu_A \leq -(Z_A\pi_A + \Omega_A H),\ \mu_N \leq -(Z_N\pi_N + \Omega_N H)].$$

Summing likelihood functions (9a) and (9b) across all individuals and maximizing will produce estimates of the underlying coefficients on the health variables (δ_A and δ_N) which are purged of the effect of health on hours by the explicit inclusion of an hours-of-work variable.[20]

The next section will estimate the empirical models described here. As a first pass, I will estimate several simple probit models of AFDC participation, including a dummy variable for Medically Needy states. I will compare these results to those achieved by estimating a three-way joint model of AFDC, hours of work, and usage of the Medically Needy program (where available). Finally, I will compare these results in turn to a two-way estimate of AFDC and Medically Needy participation, in which hours are included as a specific control variable. The primary questions of interest are, first, How important are the household health variables and Medicaid program parameters in AFDC participation decisions?; second, To what extent does the Medically Needy program affect AFDC usage?; and third, How strong are the effects of household health needs on AFDC participation after controlling for their effect on labor market involvement?

V. Estimation Results

As discussed above, the data set used for this estimation is NMCUES, which provides 475 observations on female-headed households with minor children. Of these households, 150 are in non-Medically Needy states and 325 are in Medically Needy states. The variables which will be used to estimate the models described above are listed in Table 6. Included is the standard set of household characteristics that are assumed to affect

Table 6

Variable Definitions and Means
(Standard deviations in parentheses)

Variable	Mean Values: All Observations	Medically Needy States	Non-Medically Needy States
Household Characteristics			
Age of head	38.3	37.9	39.1
	(11.7)	(12.0)	(11.0)
Education of head: dummy variables			
<12 years	.354	.348	.367
>12 years	.240	.246	.227
Household size	3.30	3.23	3.45
	(1.26)	(1.27)	(1.22)
Number of children <6 years	.423	.412	.447
	(.674)	(.649)	(.726)
Race (1 = black)	.318	.292	.373
"Other" income (Annual income other than public assistance and earnings)	$2933	$2918	$2963
	(5013)	(5040)	(4953)
Program Parameters			
Maximum AFDC benefits (Family of 4, monthly)	$382	427	284
	(136)	(122)	(113)
Maximum food stamp benefits (Family of 4, monthly, already receiving maximum AFDC benefits)	$73	59	102
	(41)	(36)	(34)
Medicaid insurance value Mean state-specific value for family of 4	$146	$157	124
	(44)	(48)	(21)
Medically needy Eligibility limit (monthly)	--	460	--
		(128)	

- Table Continued -

Table 6, Continued

Variable	Mean Values: All Observations	Medically Needy States	Non-Medically Needy States
Health Indicators			
Restricted activity days of head (Reported annual number of days head experienced activity limits owing to illness)	19.0 (37.8)	17.3 (34.3)	22.7 (44.1)
Restricted activity days of others (Reported annual number of days all other household members experienced activity limits owing to illness)	20.1 (31.3)	18.6 (31.2)	23.4 (31.4)
Physical limits on head: dummy variable (Equals 1 if head reports health limits to vigorous activity)	.251	.243	.267
Perceived health status (Mean perceived health status, averaged over all household members; scale 1 = excellent 3 = fair 2 = good 4 = poor)	1.68 (.59)	1.66 (.57)	1.99 (.93)
Number of observations	475	325	150

both labor market earnings opportunities as well as preference choices. No labor market demand variables are listed in Table 6. State-specific female unemployment rates and regional dummies were tested in all of the models, but had no effect and have been dropped from the final specifications.

The institutional parameters entered in the regressions include AFDC and Food Stamp guarantee levels, the state-specific estimate of the mean value of Medicaid insurance, as well as the protected income level of the Medically Needy program. Maximum AFDC and Food Stamp benefits available to four-person households in each state are determined by taking the four-person maximum payment level for AFDC and calculating the additional Food Stamp dollars available to a four-person family receiving this maximum payment.[21] The value of Medicaid benefits enters through the household-specific demographic and health variables, but the state average value for Medicaid insurance for a family of four, as described above, is also included. This enters the equations as a separate variable, allowing its coefficient to differ from the coefficient on the AFDC/Food Stamp maximum. The second parameter of the AFDC program, the state-specific tax rate, was included in earlier estimates, but was never significant.[22] The protected income level in Medically Needy states indicates the point at which Medicaid eligibility ends. It would be expected that states with higher protected income levels will have higher Medically Needy participation rates. The spenddown period was included in earlier estimates but was never significant. Additional measures of the extent of Medicaid coverage for various expense categories in each state were also insignificant in all equations.

Measures of health needs of each household are listed at the bottom of Table 6. A variety of additional health-related variables were tested but were excluded owing to insignificance. Restricted activity days is a standard measure of the number of days an individual experiences physical limitations owing to illness. Physical limitations on strenuous activity by the household head is a measure of disability. The variable "perceived health status" is a more subjective measure of a household's medical needs; this variable, however, makes a significant contribution to virtually every equation, even after other measures of health needs are included.

Table 7 presents a set of simple probit equations in which the dichotomous variable is receipt of AFDC (see equation 2). Column 1 shows the results from a standard probit analysis. Consistent with similar analyses on other data sets, Table 7 indicates that younger, less educated women with larger families, more young children, and smaller amounts of unearned income are more likely to use AFDC. Higher AFDC and food stamp guarantees increase participation levels. Mean state medical insurance values are insignificant in the equation, which implies that once household-specific demographic and health effects are accounted for, an aggregate state measure of the insurance value of Medicaid adds nothing. Limits on physical activity by the head increase the probability of being on AFDC, as does a poorer perceived household health status. (Restricted activity days of head or other household members is excluded from all AFDC regressions. They were included in earlier estimations, but had consistently small and insignificant effects.) It is clear that health status has a significant effect on AFDC participation, whether the

Table 7

Probit Estimates of AFDC Participation

	Simple Probit	With Medically Needy Dummy Variable	Only States with Medically Needy Programs	Only States Without Medically Needy Programs
Age of head	-.091*	-.088*	-.104*	.080
	(.045)	(.047)	(.054)	(.155)
Age squared	.0007*	.0007	.0009*	-.001
	(.0005)	(.0006)	(.0006)	(.002)
Education of head (<12 years)	.264*	.256*	.363*	.095
	(.185)	(.186)	(.234)	(.344)
Education of head (>12 years)	-.418*	-.419*	-.354*	-.590*
	(.195)	(.195)	(.240)	(.378)
Household size	.314*	.313*	.318*	.264*
	(.068)	(.068)	(.082)	(.141)
Number of children <6 years	.594*	.610*	.672*	.566*
	(.115)	(.121)	(.194)	(.190)
Race (1 = black)	.045	.040	.039	.110
	(.159)	(.160)	(.202)	(.325)
"Other" income	-.0002*	-.0002*	-.0002*	-.0001*
	(.00002)	(.00002)	(.00005)	(.00004)
Limited activity of head (0/1 variable)	.548*	.557*	.674*	.323
	(.179)	(.181)	(.234)	(.342)
Mean perceived health status (1 = exc., 4 = poor)	.369*	.377*	.289*	.418*
	(.151)	(.152)	(.197)	(.301)
AFDC + food stamp maximum	.002*	.002*	.002*	.003*
	(.001)	(.001)	(.001)	(.002)
Medicaid insurance value	.0008	.0004	-.0004	.009*
	(.002)	(.002)	(.002)	(.007)

- Table continued -

Table 7, Continued

	Simple Probit	With Medically Needy Dummy Variable	Only States with Medically Needy Programs	Only States Without Medically Needy Programs
Medically needy state (=1)	--	.157 (.213)	--	--
Constant	-.951 (1.020)	-.932 (1.029)	-.156 (1.279)	-5.387* (2.876)
Likelihood value	-199.6	-199.2	-130.6	-65.0
Number of observations	475	475	325	150

Note: See Table 6 for more extensive variable definitions.

*Significant at 10% level or higher.

coefficients in Table 7 are interpreted as measures of the value of Medicaid or as measures of the impact of health on earnings capability.

Column 2 includes a dummy variable for Medically Needy states. Contrary to expectations, the impact of the Medically Needy program is positive and insignificant. The above discussion indicated that the Medically Needy program should decrease AFDC participation by allowing households to receive Medicaid without establishing AFDC eligibility. To further explore the differences between states with and without Medically Needy programs, columns 3 and 4 estimate separate probit equations for individuals in each group of states. Interestingly, the general measure of the insurance value of Medicaid significantly affects AFDC participation in states without Medically Needy programs, but not in Medically Needy states, where Medicaid is not so tightly linked to AFDC eligibility. However, a likelihood ratio test comparing the separate estimates in columns 3 and 4 with the combined estimates in column 1 indicates no statistical gain to a separate estimation strategy.

The probit estimates in Table 7 indicate, first, that household-specific health variables clearly influence AFDC participation decisions; second, that a more aggregate measure of the value of Medicaid insurance appears to have little additional explanatory power; and third, that the presence of the Medically Needy program by itself seems to have little impact on AFDC participation.

To further explore these results, Table 8 provides estimates of a more complex three-way choice model between AFDC, hours, and Medicaid participation, as described in equations (5), (8a) and (8b) above. As noted, the equation for Medicaid participation is estimated solely from

Table 8

Joint Estimates of Labor Force, AFDC, and Medically Needy Participation

	AFDC Participation	Hours of Work	Medically Needy Participation
Age of head	-.078*	3.010*	--
	(.053)	(.732)	
Age squared	.0006	-.036*	--
	(.0006)	(.008)	
Education of head (<12 years)	.168	-5.635*	--
	(.228)	(3.021)	
Education of head (>12 years)	-.388*	3.368	--
	(.222)	(3.514)	
Household size	.306*	-1.364*	.111
	(.076)	(1.065)	(.180)
Number of children <6 years	.538*	-4.283*	.709*
	(.152)	(2.266)	(.374)
Race (1 = black)	-.016	-1.952	.721*
	(.196)	(2.830)	(.413)
"Other" income	-.00015*	-.0005*	.00003
	(.00002)	(.0002)	(.00003)
Restricted activity days of head	--	-.049*	.012*
		(.031)	(.004)
Restricted activity days of others	--	--	-.024*
			(.017)
Limited activity of head (0/1 variable)	.512*	-8.239*	.217
	(.216)	(3.280)	(.511)
Mean perceived health status (1 = exc., 4 = poor)	.304*	-6.046*	.943*
	(.173)	(2.322)	(.309)

- Table continued -

Table 8, Continued

	AFDC Participation	Hours of Work	Medically Needy Participation
AFDC + food stamp maximum	.002* (.001)	--	--
Medicaid insurance value	-.0004 (.002)	--	-.002 (.004)
Medically needy eligibility level	--	--	.003* (.002)
Constant	-1.174 (1.146)	-13.326 (14.473)	-4.719* (1.323)
Standard error		21.491* (1.353)	
Correlation coefficients	r_{HA} = -.247* (.116)		r_{HM} = -.046 (.295)
Likelihood value		1886.2	

Notes: See Table 6 for more extensive variable definitions. Number of observations = 475.

*Significant at 10% level or higher.

those households in Medically Needy states who are not on AFDC. The coefficients for the hours equation in Table 8 provide a standard set of results. Older women with more education and fewer children are likely to work more. All forms of health limitations have negative effects on hours. Thus, the limiting effect of AFDC on health is at least partly due to its limiting effect on labor market involvement. The estimates of AFDC participation and hours in Table 8 are virtually identical to those in Table 7, as they should be (the joint estimation increases efficiency only). As one might expect, the intercorrelation between the AFDC and hours equations is significant and negative, implying that the unexplained higher residuals in the hours equations are correlated with the unexplained low residuals in the AFDC equations (i.e., unexplained high hours are correlated with unexplained low AFDC usage). This is an indication of the simultaneous nature of the hours/AFDC choice, and the correlation, while not extremely high, is still significant.

The determinants of participation in the Medically Needy program are shown in the third set of coefficients in Table 8. Participation in Medicaid through the Medically Needy program is positively affected by number of small children and minority status. Restricted activity days of the head have a significant positive effect, although restricted activity days of other household members are negative, a somewhat puzzling result. Limited physical activity of the head has little effect, but poor perceived health status is strongly and positively related to Medicaid usage. The short story from this equation is that significant illness on the part of the head of the household (although not long-term physical limits) and the presence of small children are most likely to

place a non-AFDC household on the Medically Needy program. As expected, the protected income level of the Medically Needy program does have a positive effect on usage. The larger the eligibility range, the more likely a household is to participate. As is also true in the AFDC participation equations, the average state value of Medicaid insurance to the household appears to have little effect by itself.

The results in Table 8 continue to affirm the importance of health in determining AFDC and work hours choices, as well as affecting participation in the Medically Needy segment of Medicaid. However, as noted in the previous section, the coefficients on the health variables in the AFDC and Medically Needy participation equation confound their effects on the value of Medicaid with their effects on hours of work, both of which influence AFDC and Medicaid participation. Table 9 provides estimates of AFDC and Medically Needy participation, with hours of work explicitly included as a control variable. These results are based on equations (9a) and (9b) from the previous section.[23] The inclusion of hours has clear effects on the coefficients in the AFDC equation. The human capital variables become somewhat smaller and less significant (their effects on AFDC via hours are now being captured by the hours variable itself). While the effect of the health variables also decreases, physical limitations on head's activities continue to influence AFDC participation, even after their impact on hours of work are controlled for. The effects of the structural program variables are largely unchanged.

The Medically Needy participation equation is less affected by the inclusion of hours, which is not surprising, given its low correlation with hours in Table 8. While increased hours of work clearly make

Table 9

Joint Estimates of AFDC and Medically Needy Participation with Hours as an Independent Variable

	AFDC Participation	Medically Needy Participation
Age of head	-.026 (.056)	--
Age squared	-.00007 (.0007)	--
Education of head (<12 years)	.044 (.225)	--
Education of head (>12 years)	-.373* (.221)	--
Household size	.306* (.078)	.199 (.207)
Number of children <6 years	.619* (.142)	.652* (.342)
Race (1 = black)	-.034 (.190)	.838* (.471)
"Other" income	-.0002* (.00003)	.00001 (.00002)
Restricted activity days of head	--	.011* (.004)
Restricted activity days of others	--	-.022 (.018)
Limited activity of head (0/1 variable)	.418* (.207)	.054 (.482)
Mean perceived health status (1 = exc., 4 = poor)	.127 (.173)	.748* (.341)

- Table continued -

Table 9, Continued

	AFDC Participation	Medically Needy Participation
AFDC + food stamp maximum	.0014*	--
	(.001)	
Medicaid insurance value	.0005	-.0005
	(.002)	(.005)
Medically needy eligibility level	--	.003*
		(.001)
Hours of work	-.043*	-.029*
	(.006)	(.015)
Constant	-.051	-3.755*
	(1.254)	(1.406)
Likelihood value	-205.7	

Notes: See Table 6 for more extensive variable definitions.
Number of observations = 475.

*Significant at 10% level or higher.

Medicaid receipt less likely (as noted above, women who work more hours are far more likely to be covered by private insurance), the health and program variables remain much as they did in the estimates in Table 8. In other words, the use of Medicaid through the Medically Needy program is clearly affected by health problems of the household, even after labor market involvement is held constant.

Although the results in Tables 7 through 9 are interesting, it is often hard to interpret such estimations without looking at the effects on a simulated household. Table 10 provides an indication of the behavioral responses indicated by the estimated coefficients. Table 10 looks at the AFDC, labor market, and Medicaid decisions of an individual with a standard set of characteristics. Part A varies the health status of the household, and Part B varies parameters in the AFDC and Medicaid programs, indicating how estimated AFDC, labor market, and Medicaid participation change. Estimates in Table 10 are based on the coefficients from Table 8.

A woman with the standard characteristics defined here has about a 46% chance of being on AFDC and a 54% chance of not using the program. For women in Medically Needy states who are not on AFDC, there is a 15% chance they will use the Medically Needy program at some point during the year, and a 39% chance they will not. The top part of Table 10 indicates how these participation estimates change as the measures of health status change. If the head has a serious physical limitation, her probability of being on AFDC rises to 66%, but the probability of participating in the Medically Needy program decreases as her chances of being off AFDC fall. Households who perceive themselves as having only "fair" health

Table 10

Simulating AFDC Usage, Labor Force Participation, and Medically Needy Program Usage[a]

	Joint Probability of Being on AFDC and Working	Joint Probability of Working and Not Being on AFDC	In Medically Needy States: Probability of Not on AFDC, Working, and Using Medically Needy Program	In Medically Needy States: Probability of Not on AFDC, Working, and Not Using Medically Needy Program
A. Effect of Changes in Health Status				
Standard Individual[b]	.457	.543	.149	.394
With Physical Limits[c] on Heads	.657	.343	.120	.223
With Increased Restricted[d] Activity Days	.457	.543	.142	.401
With Perceived Health[e] = Fair	.615	.385	.285	.100
B. Effect of Changes in Program Parameters				
Standard Individual[b]	.457	.543	.149	.394
Increase Medicaid[f] Eligibility Limit by $100	.457	.543	.344	.199
Increase Ben+FS and Medicaid Eligibility Limit by $100[g]	.544	.456	.288	.167
Decrease Ben+FS and Medicaid Eligibility Limit by $100[h]	.371	.629	.523	.106

- Table continued -

Table 10, Continued

[a]Simulations based on results reported in Table 8.

[b]Age = 30; Educ < 12 years; race = black; household size = 3; children < 6 = 1; annual other income = $2,000; monthly AFDC benefit plus food stamp maximum = $454; Medicaid income eligibility limit = $421; medical insurance value = $146; annual restricted activity days of head = 19.0; annual restricted activity days of others = 20.1; limitations on physical activity of head = 0; perceived health status, scale of 1 (excellent) to 4 (poor) = 1.68.

[c]Same as standard individual except limitations on physical activity of head = 1.

[d]Same as standard individual except restricted activity days of head = 22.0, restricted activity days of others = 23.1.

[e]Same as standard individual except perceived health status = 3.

[f]Same as standard individual except Medicaid eligibility limit = 521.

[g]Same as standard individual except AFDC benefit plus food stamp maximum = $554; Medicaid income eligibility limit = $521.

[h]Same as standard individual except AFDC benefit plus food stamp maximum = $354; Medicaid income eligibility limit = $321.

are more likely to be on AFDC (62%), but are also very likely to participate in the Medically Needy program if not on AFDC. These simulations affirm the importance of health in determining the likelihood of AFDC receipt among certain households.

The bottom part of Table 10 indicates how AFDC, labor market, and Medicaid usage changes as the parameters of the AFDC and Medicaid programs are varied. If the Medically Needy protected income eligibility limit were expanded by $100 (without any changes in the eligibility levels for AFDC and food stamps), this woman's probability of using the Medically Needy program would rise from 15% to 34%. If the increase in Medically needy eligibility levels is matched by a $100 increase in AFDC and Food Stamp benefit levels, both AFDC participation and Medically Needy participation probabilities rise. Of course, the magnitude of the change depends on the starting level of benefits. Additional simulation results, not reported here, indicate that the lower the initial AFDC benefit levels, the greater will increases in AFDC or Medically Needy eligibility limits affect behavior.

VI. Concluding Comments

The initial sections of this paper indicated that many female-headed households should want to be covered by the Medicaid program, both because its insurance increases the level of the household's medical care, and because private insurance is not readily available to many of these women. A theoretical exploration of the Medicaid eligibility rules indicated that women who value medical insurance should be likely to seek AFDC eligibility in order to guarantee health care. The presence of the

Medically Needy program in some states, allowing women under some circumstances to receive Medicaid when not eligible for AFDC, offered one way of testing the impact of medical need on AFDC participation. The results of this paper have supported some, but not all, of our initial hypotheses.

First, it is clear that greater health needs induce greater use of the AFDC program. This is true even when the impact of health on hours of work is controlled for. This is consistent with the hypothesis that households with greater medical needs value medical insurance more highly, and thus will be more likely to seek AFDC eligibility. It is also true that health has a significant impact on hours in the labor market. A large part of the effect of health variables in a simple probit equation of AFDC participation comes from the effect of health on labor market choices. Clearly, models of AFDC participation that ignore health factors are omitting a very important variable.

Second, this paper has indicated that the presence of the Medically Needy program has little impact on AFDC participation. There is little support here for the hypothesis that the Medically Needy program induces women to leave AFDC by providing them with continued medical insurance coverage. This is probably not too surprising, given the extremely limited nature of Medically Needy coverage (over a very short spenddown period) and the low level of income eligibility set by most states for coverage by the Medically Needy program.

Third, within those states that offer the Medically Needy program, it is clear that the program induces higher levels of Medicaid usage. Quite a high percentage of women--even those with significant labor market

attachment--report some use of Medicaid over the year without a concomitant use of AFDC. This usage is strongly related to the presence of small children in the household, and to increased illness of the head. It is also significantly affected by the income eligibility level for the Medically Needy program set by the state. As Table 4 indicates, the main difference between states with and without the Medically Needy programs was in the number of households that were uninsured, implying that the Medically Needy program attracted participants who would otherwise have been uninsured. Thus, while the Medically Needy program increases state medical costs, it does provide an avenue of assistance to working low-income households who have chosen not to participate in other welfare programs.

It should be noted that this paper does not answer the question of whether extended Medicaid coverage would significantly affect behavior. While the presence of the Medically Needy program has little affect on AFDC usage, this does not imply that a major extension of Medicaid coverage, separating it from AFDC eligibility, would not have large effects. In fact, given the importance of health on the use of AFDC and on use of the Medically Needy program where it is available, it is likely that any major expansion of health care for low-income families might significantly improve their welfare and increase their work effort. The evidence provided in this paper on the lack of health insurance coverage among many female-headed households certainly indicates a need to consider ways to extend either public or private insurance coverage to more low-income, female-headed families.

A number of research issues raised here are worthy of further investigation. First, this paper ignores issues of underinsurance, looking only at the presence or absence of some form of insurance coverage. It would be useful to have more detailed data on extent of coverage, to indicate how different coverage schemes affect behavior. Second, longitudinal data on the use of AFDC and Medicaid over time would be very interesting. This information could be used to investigate whether the extension of Medicaid benefits for several months after the end of AFDC is useful in getting women off AFDC and into the labor market. Longitudinal data on health problems would also be useful in determining how extensive the health problems and medical bills of the uninsured are, and the extent to which lack of medical care in one time period induces further medical problems in the future. Finally, this paper ignores many of the programmatic differences in Medicaid between states, such as differences in the extent of coverage of non-AFDC households. More detailed research on the effects of these variations would surely be useful to the many states struggling to determine how best to structure an effective Medicaid program.

Appendix Table A

State Medically Needy Programs

	Medically Needy Program?	1980 AFDC Maximum Monthly Payment (4-Person Family)	1980 Medicaid Monthly Net Protected Income (4-Person Family)	Spenddown Period (Months)
Alabama		$148		
Alaska		514		
Arkansas	Yes	244	$258	3
Arizona[a]		188		
California	Yes	563	650	3
Colorado		363		
Connecticut	Yes	553	500	6
Delaware		312		
D.C.	Yes	349	405	6
Florida		230		
Georgia		193		
Hawaii	Yes	546	550	6
Idaho		367		
Illinois	Yes	350	333	6
Indiana		315		
Iowa		419		
Kansas	Yes	390	410	6
Kentucky	Yes	235	317	3
Louisiana	Yes	187	292	3
Maine	Yes	352	475	6
Maryland	Yes	326	342	6
Massachusetts	Yes	444	440	6
Michigan	Yes	501	499	6
Minnesota	Yes	486	424	6
Mississippi		120		
Missouri		290		
Montana	Yes	331	442	3
Nebraska	Yes	370	467	6
Nevada		314		
New Hampshire	Yes	392	381	6

- Table Continued -

Appendix Table A, Continued

	Medically Needy Program?	1980 AFDC Maximum Monthly Payment (4-Person Family)	1980 Medicaid Monthly Net Protected Income (4-Person Family)	Spenddown Period (Months)
New Jersey		$414		
New Mexico		267		
New York	Yes	476	$458	6
North Carolina	Yes	210	283	6
North Dakota	Yes	408	530	1
Ohio		327		
Oklahoma	Yes	349	467	4
Oregon		569		
Pennsylvania	Yes	395	396	6
Rhode Island	Yes	454	575	6
South Carolina		158		
South Dakota		361		
Tennessee	Yes	148	200	3
Texas		140		
Utah	Yes	429	486	1
Vermont	Yes	553	503	6
Virginia	Yes	360	367	6
Washington	Yes	536	536	3
West Virginia	Yes	249	275	6
Wisconsin	Yes	529	583	6
Wyoming		340		

[a]Arizona has no Medicaid program.

Notes

[1]See U.S. Department of Health and Human Services (1983).

[2]Some women and children are covered by insurance policies through their ex-spouses.

[3]There is an extensive literature on uninsurance and underinsurance. Among the most recent contributions are Farley (1985), Davis and Rowland (1983), and Aday, Anderson and Fleming (1980). None of these studies looks explicitly at female-headed households.

[4]For instance, see Aday and Anderson (1981), Davis and Rowland (1982, 1983), and Wilensky and Berk (1982).

[5]Kasper (1986) provides extensive cross-tabulations of the use of medical services, health status, demographic category, and insurance coverage for other population groups.

[6]An attempt was made to distinguish between the initial propensity to use a service and the extent of usage by jointly estimating a probit equation for the probability of using a service sometime during the year together with a tobit equation on the extent of usage conditional upon access. In every category, the correlation between the two equations converged to one.

[7]There is some problem of simultaneous causality here, as these health measures may in turn be related to medical care utilization.

[8]See U.S. Department of Health and Human Services (1982) for information on the Medicaid program in 1980.

[9]The categories are inpatient hospital services, outpatient hospital services, rural health clinic services, laboratory and X-ray services,

skilled nursing facility services, physician services, dental care for those under age 21, and family planning services.

[10]One state, Arizona, had no Medicaid program in 1980.

[11]The formula by which expected income and medical bills are determined varies from state to state.

[12]Many states originally had protected income levels at the maximum allowable amount, but when they subsequently changed AFDC benefit levels, they neglected to change the Medicaid eligibility levels. See Davidson (1979) for further discussion of this issue.

[13]For notational simplicity Figure 1 ignores the additional impact of food stamps on the transfers available to a household. Food stamp benefits will be included in the empirical analysis below.

[14]Speaking with people in several states who run the Medicaid program, I find that there appears to be a general agreement that Medicaid provides as much or more coverage than most private plans. (Of course, this varies somewhat between states.)

[15]Data for 1979 and 1984 are in Tables B-8 and B-9 of U.S. Department of Health and Human Services (1983). Equivalent estimates for 1980 were obtained through the Population Division of the Census Bureau.

[16]An alternative is to sum the insurance values across actual family size, rather than standardizing by a family of four. However, this variable is very collinear with the household size variable, which is also included in the estimates. Given that family size is separately controlled for, there seems little problem with imputing insurance values to each family based on a standardized "family of four" measure.

[17]Note that wages are not explicitly estimated in any of these equations. The X vectors include those human capital variables which are typically assumed to influence wages. A literature of the effects of health on wages exists (Lee, 1982; Lambrinos, 1981; or Bartel and Taubman, 1979). I do not estimate a separate wage equation because of the computational difficulties involved in trying to estimate four joint equations (as would be necessary for Medically Needy states in the procedure described below).

[18]For instance, Moffitt (1985) tries to implement this approach in a joint model of food stamps and AFDC (where the notches are smaller) and cannot achieve convergence in the full model. A related paper by Fraker and Moffitt (1985) looks at the overlapping effects of Food Stamp and AFDC benefit levels and uses only a partial structural model.

[19]Further statistical information on this model, including the computer programs necessary to estimate it, are available from the author.

[20]Note that because AFDC and Medically Needy participation are never observed together, it is impossible to estimate a correlation coefficient for the bivariate distribution in equation (9b). Thus, the results from this estimation are identical to those produced by independent estimates of AFDC and Medically Needy participation equations.

[21]Not surprisingly, the Food Stamp amounts available for a given AFDC maximum benefit level are highly correlated with that benefit level. Thus, the maximum Food Stamp plus AFDC benefit guarantee is entered as a single variable, rather than separating Food Stamps from AFDC benefits.

[22]While all states face the mandatory two-thirds tax rate imposed by the federal government on AFDC benefits, the variance in allowable

deductions creates significant differences among states in the effective tax rate for most households. Estimates of tax rates were done using the methodology in Blank (1985).

[23]The insignificant correlation between participation in the Medically Needy program and hours of work in Table 8 indicates there is little simultaneity bias induced by including hours in the Medically Needy participation equation. As noted above, this is less true of the AFDC participation equation, which is correlated with the hours decision.

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