There are several reasons to anticipate that income transfer programs would reduce socioeconomic disparities in health. Income transfers could help low-income individuals buy important health resources, such as nutritious food or good housing. Income transfers could also reduce health disparities by generally alleviating the stress and uncertainty associated with financial strain. But, on the other hand, there are reasons to be skeptical about the health returns of transfer income. Can a modest income transfer—such as those received through unemployment insurance, the Earned Income Tax Credit (EITC), or Temporary Assistance to Needy Families (TANF)—really do anything to counter the health risks and problems that accumulate differentially by socioeconomic status across people's lives?

Estimating the health returns to transfer income, and attempting to answer these questions, can be very tricky. Social programs tend to cater to particular groups and, within these groups, certain individuals may be more or less likely to take advantage of the resources available through the programs. This means that individuals are selecting, and being selected, into social programs based on several characteristics (e.g., SES, general motivation and ability to navigate bureaucracy, etc), all of which may be associated with health, and several of which may not be observed within a given dataset. Such possible selection on unobservable characteristics may obviously lead to bias when we attempt to estimate the health returns of transfer income.

When considering entitlement programs that tend to cater to more advantaged individuals (e.g., unemployment insurance), we may be particularly concerned that the selection of relatively well-off and healthy individuals into programs is upwardly biasing estimates of health returns. When considering means-tested programs, in which eligibility tends to be limited to less advantaged individuals (e.g. EITC or TANF), we may alternatively be concerned that selection is leading to downwardly biased estimates. Variation in whether eligible individuals take advantage

of program benefits may also lead to selection bias, but it is unclear in which direction such bias would operate. If it is generally more advantaged individuals with greater resources who can mobilize to take advantage of income transfer programs, self-selection might lead to upward bias. But, if it is generally disadvantaged individuals facing greater financial strain who are motivated to enroll in programs, self-selection might lead to downward bias.

In this paper, I estimate the health returns of transfer income, attempting to factor out these various selection possibilities by using state-level policy variations as instrumental variables (IV). More specifically, I run separate analyses of unemployment insurance, EITC, and TANF, using state variations in the policies that govern these programs as sources of exogenous variation in the amount of transfer income a person may receive. The strength of an IV approach derives from the assumption that the instrument will affect a person's risk of receiving treatment—in this case, transfer income—but will not directly affect a person's outcome—in this case, health. (this is typically know as the exclusion assumption; see e.g. Angrist, Imbens, and Rubin 1993).[1] State-level variation in these income transfer programs should meet this fundamental requirement of an IV. A state's generosity with regard to a given income transfer program should have a notable effect on a person's likelihood of receiving transfer income from the program, but it should not have a direct effect on a person's health (conditioning on certain individual and state-level variables, to be discussed further below). In this vein, focusing on state-level policy variations may allow me to estimate the health returns of transfer income, net of selection into income transfer programs.

This paper uses data from the 1996-2001 March Current Population Surveys (CPS). The March CPS regularly collects detailed information about transfer income and provides a large

[1] Stating the second half of this assumption slightly differently, an instrumental variable should not be associated with the unobserved determinants of the outcome (typically, noted as u_i), and it should therefore allow us to estimate the association between a treatment and an outcome, net of selection into treatment.

sample that should help generate a precise IV estimate. Beginning in 1996, the March CPS began inquiring about respondents' health, asking them to assess their health as excellent, very good, good, fair, or poor. This self-assessed health measures serves as the dependent variable for this analysis.

State policy variations have been used somewhat widely within economics in order to identify the effects of transfer income on labor market outcomes (e.g. duration of unemployment spells, wages, wives' employment, etc.; see e.g. Anderson and Meyer 1998; Katz and Meyer 1990). State-level variation has not, to my knowledge, been used as an instrumental variable to identify the effects of transfer income on health.[2] When evaluating state-level policy variations as an IV for this analysis, one of the first points to note is that unemployment insurance, EITC, and TANF policies do, indeed, generate significant state-level variation. For instance, the rate at which unemployment insurance replaces pre-displacement wages ranges from a high of 56 percent in Rhode Island to a low of 31 percent in Alaska (U.S. Dept of Labor 2004). Several states within the U.S. offer their own refundable EITCs, which equal a percentage of the federal credit, and these may range from a low of five percent in Oklahoma, Maine, and Oregon to a high of 43 in Wisconsin (Kobes 2004). TANF benefits are of course notorious for their large state variation, and maximum monthly TANF benefits for a single-parent family of three can vary from a low of $164 in Alabama to a high of $801 in Minnesota (State Policy Documentation Project 2001). Eligibility requirements for all these programs can of course also differ significantly across states, but such variation is too complicated to discuss here.

When evaluating these policies as IVs, we must next consider whether policy endogeneity means that a person's state of residence directly affects health, thereby violating the

[2] There is one paper, by Bitner et al (2004), in which the authors use state-variation to identify the effects of welfare reform on health, but this paper cannot provide an estimate of the effects of transfer income *per se* on health since welfare reform involved multiple policy changes at once.

exclusion assumption of an IV approach. State variation in income transfer policies will generally develop in response to characteristics of the state's population, political environment, and economy. For instance, most evidence suggests that a state's unemployment insurance generosity depends primarily on state labor market characteristics (e.g., unionization rate, unemployment rate, percentage of industrial jobs, etc; Blank and Card 1991, Vroman 2001). Alternatively, TANF generosity will generally be sensitive to population characteristics, such the poverty rate, and also market characteristics, such as the price of housing (Plotnick and Winters 1985). The question we need to ask then is whether the underlying state differences that lead to income transfer generosity (e.g. unionization rate, unemployment rate, housing prices) will have a direct effect on health, net of individual level characteristics (e.g. earnings and work history, education, etc). In several cases, for instance with unionization rates, it seems unlikely that, once I control for individual level earnings and work history, state factors will have a direct effect on health. In other cases, for instance with poverty rates, it may not be as easy to assume no influence, net of individual-level controls. Data on states' populations, political environments, and economies are generally available through a variety of sources and I should control for those state-level factors that are most relevant to each of the income transfer program.

We next need to consider whether state differences that are not necessarily leading to income transfer generosity, but may be associated with it, could have a direct effect on health. Most notably, spending on other social programs, such as Medicaid or Food Stamps, is probably associated with income transfer generosity and may have a direct effect on an individual's health. But, again, data on state welfare spending is typically available, and I should be able to control for such potential confounding factors.[3]

[3] In the case of TANF, covariance with other social programs—most notably, Medicaid—may be particularly pronounced and difficult to deal with. In order for TANF to work as an IV in this analysis, there will have to be

Unfortunately, despite these efforts to factor out underlying variation and strengthen the exclusion assumption, a certain amount of uncertainty is inevitable. While the exclusion assumption is crucial to an IV approach, we cannot directly test it. In this paper, however, I take two important steps to help assess the sensitivity of my results. First, working with three different instruments may offer a check on the findings. If estimates based on state-level variation in unemployment insurance, EITC, and TANF yield very different results, we will obviously need to be cautious in our interpretation. Second, I will take steps to directly assess the sensitivity of the estimates. Recent work by DiPrete and Gang (2005) proposes an intuitive and appealing method for testing the sensitivity of estimates to violations of the exclusion assumptions, and I intend to use this method to test assess all of my results.

Findings from this work may speak to important policy questions related to socioeconomic disparities in health. Comparing estimates across different income transfer programs that are designed differently and target different segments of the population may yield insights into where we can expect the largest health returns to income transfers. Does transfer income have its greatest health impact when it protects people against socioeconomic shocks, like unemployment? Or does it have a greater impact when targeted at the most disadvantaged segments of the population (e.g. as those served by TANF)? On a broader scale, though, results from this project may also address more general questions about whether existing redistributive social programs can potentially reduce health inequalities.

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independent variation between TANF benefit sizes and state Medicaid spending. That is, there will have to be some states with relatively similar levels of Medicaid spending, but significant differences in their TANF benefits. If, after further research, it appears that such variation does not exist, I will have to abandon TANF state variation as an IV and work simply with unemployment insurance and EITC.

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