Do public goods explain the relationship between income inequality and birthweight?

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Abstract

This paper examines the relationship between income inequality at the state and county levels and birthweight, and delves into one causal pathway through which inequality is likely to operate upon health. The "neo-materialist" relationship between inequality and health argues that income inequality impacts health mainly because inequality affects the distribution of resources in a community. Individual data is taken from 1991 and 2001 Natality Detail Files, while data for inequality measures and community characteristics are obtained from the decennial Censuses. Information on public goods and services are obtained from a variety of sources including the Annual Survey of Government Finances and the Area Resource File. I find that public goods are positively correlated with birthweight; and income inequality is associated with higher public goods. Moreover, the inclusion of public goods measures as controls strengthens the relationship between income inequality and birthweight. To the extent that income inequality causally increases public goods, public goods potentially dampen the negative effect of income inequality on birthweight. Studies that do not take into account the public goods affect may underestimate the negative effect of inequality on birthweight.

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Introduction

That income and socioeconomic status (SES) enter the child health production function and offer protective benefits to health is fairly well established in the economics literature (Newacheck 1994; Currie and Hyson 1999; Case, Lubotsky, and Paxson 2002; Currie and Stabile 2003). Moreover, it is generally agreed that the relationship between SES and health, or the health production function is concave (Preston 1975; Rodgers 1979). What has been debated is whether income inequality, or the dispersion of income in a society has a detrimental effect on health outcomes. This paper examines the relationship between income inequality at the state and county levels and infant health, and delves into one causal pathway through which inequality may operate upon health. The so-called "neo-materialist" relationship between inequality and health argues that the impact of income inequality operates upon health mainly because inequality affects the distribution of resources. Inequality is thus posited to be detrimental to health through reduced provision of public goods. This paper addresses the question: Does the provision of public goods such as education and health care explain the relationship between income inequality and child health at birth? The public goods measures used in this paper capture the resources allocated to improving the general welfare of the community.

Birthweight is an important health outcome to study as low birth weight (LBW) babies are more likely to be stunted and underweight because of impaired immune systems which compromises their ability to fight infections and absorb necessary nutrients (Osmani and Sen 2003). LBW infants have lower educational attainment and worse health status and increasing weight at birth increases the height, educational attainment, and earnings into adulthood (Behrman, Rosenzweig, and Taubman 1994; Currie and Hyson 1999; Behrman and Rosenzweig 2004). I study the supply of public goods at the state (county) level as the potential causal link

between state (county) income inequality and individual health because the provision of public goods is potentially modifiable through policy intervention. Increasing the number of public clinics has a positive effect on child health outcomes (Grossman and Jacobowitz 1981), government expenditures on health are associated with lower infant mortality rates (Judge, Mulligan, and Benzeval 1998), and improving women's access to prenatal care through expansions in Medicaid eligibility has a beneficial effect on the incidence of LBW and infant mortality (Currie and Gruber 1996). Understanding the mechanism by which the income distribution impacts child health will aid in targeted policy intervention.

The existing literature on the relationship between income inequality and child health outcomes finds a positive correlation between income inequality and LBW (Kaplan et al. 1996; Lynch et al. 2001), pre-term birth (Huynh et al. 2005), and infant mortality (Rodgers 1979; Flegg 1982; Pampel and Pillai 1986; Waldmann 1992; Wennemo 1993; Kennedy, Kawachi, and Prothrow-Stith 1996; Fiscella and Franks 1997; Judge, Mulligan, and Benzeval 1998; Meara 1999; Mellor and Milyo 2001; Mayer and Sarin 2006). With few exceptions (Meara 1999; Mayer and Sarin 2006; Huynh et al. 2005) where the relationship between income inequality and child health is examined at the individual level, the vast majority of these studies use data aggregated at the country or state (Kaplan et al. 1996; Kennedy, Kawachi, and Prothrow-Stith 1996) level.

At almost every level of aggregation (country, state, division, county, census tract, MSA, etc.) the negative correlation between inequality and health has been observed. However very little is known about the precise mechanism by which income inequality poses a risk for individual health. The literature conjectures that public goods or social spending is one of the mechanisms by which inequality impacts health, however, few studies have tested this hypothesis (Subramanian and Kawachi 2004; Mayer and Sarin 2006). The intuition behind this

argument is that unequal societies are also unhealthier perhaps because the rich are unwilling to support policies or subsidize public goods that they are unlikely to benefit from or use. Empirical evidence is mixed. Kaplan et al. (1996) demonstrate that income inequality between states in the U.S. is positively correlated with expenditures on medical care and police protection, but negatively correlated with education expenditures. In a cross-country analysis, Pampel and Pillai (1986) find that controlling for government expenditures on health care renders the inequality effect on infant mortality statistically insignificant. Mayer and Sarin (2006) find that inequality is positively related with state spending on health care and reduces the probability of neonatal mortality. Since mortality during infancy is most likely preceded by low birthweight, it is important to understand the relationship between inequality and birthweight.

This paper contributes to the literature in the following ways: first, the vast majority of previous studies of income inequality and child health have been concerned with studying the income inequality effect in relation to the probability of infant mortality. Studies of the inequality effect on birthweight as a child health outcome are relatively rare, and existing studies analyze data aggregated at the national or state level. To my knowledge, this is the first study to investigate the effect of income inequality on individual birthweight. Second, the mechanism of social spending or public goods has not been studied in the context of birthweight. The importance of understanding the inequality effect on birthweight is underscored by the finding that public goods mediate the relationship between income inequality and neonatal mortality. As Mayer and Sarin (2006) point out, this suggests that inequality may operate upon neonatal mortality through birthweight. Finally, social spending as a mechanism has been assessed at the state and country level. This paper adds to the literature by analyzing the neo-materialist relationship between inequality and health at the county level, which may be important to

understand as county governments are also responsible for making health and education financing decisions.

The remainder of this paper proceeds as follows: the next section presents an overview of the literature with respect to three questions – (i) What is the relationship between income inequality and government spending, taxation and redistribution? (ii) Do public goods have a beneficial impact on individual health? (iii) What have we learned so far about the relationship between income inequality and health? The following section describes the empirical method used to estimate the effect of income inequality on child birthweight, and assess the role of public goods in explaining the relationship between the two. I introduce the sources of individual, state and county level data used in this analysis and present the means and standard deviations of the variables of interest in the proceeding section. The penultimate section provides the results, and the final section concludes.

Literature Review

This section contains three sub-sections designed to present a brief overview of the literature with respect to three distinct questions:

What is the relationship between income inequality and government spending, taxation and redistribution?

I draw upon the public economics literature to address whether the provision of public goods and expenditure on health and education are higher or lower in more unequal societies, and the results are mixed. Greater inequality in income may lead to greater demand for progressive taxation, i.e. policies that redistribute income from the rich to the poor. This assumes that the median voter is the decisive voter. When income inequality increases the median drops relative to the mean, and the median voter who is now poorer will demand greater pro-poor

redistribution. This may take the form of explicit transfer payments, public expenditure on programs such as education, health and child care, and regulatory policies (Romer 1975; Roberts 1977; Meltzer and Richard 1981; Alesina and Perotti 1993; Alesina and Rodrik 1994). Furthermore, Moene and Wallerstein (2001) distinguish between the median voter's demand for policies and services that affect the poor and the very poor, assuming that the median voter wants to insure against the risk of future loss of income. Thus the median voter will support policies that provide universal insurance against potential loss of income or health (which will be financed by the rich when taxes are progressive and the rich get richer), and will not support policies that are geared towards the very poor (which the median voter would subsidize, but never use). Milanovic (2000) in a cross-country comparison of pre- and post-tax income finds that countries with greater pre-tax income inequality redistribute more to both the poor and very poor. An alternate explanation for why increases in income inequality may lead to greater redistribution and higher social spending is that as the poor get poorer, the rich get fearful of the poor (who may be driven to violence and crime) and choose to subsidize public goods and services in order to placate the poor (Piven and Cloward 1993).

Greater inequality may, on the other hand, be associated with lower expenditures on public goods. This could happen if the poor are disenfranchised and choose not to vote (Mayer and Sarin 2006). Additionally, Benabou (1996) and Rodriguez (1998) point out that the median voter theorem assumes that each person has one vote and that political power is equal among all voters. However, if greater economic resources lead to more political influence, then the positive relationship between income inequality and redistribution may not hold. Finally, the pressure group model argues that individuals care more about the well-being of people who they consider themselves similar to. Thus, if the middle income group shares a greater affinity with

the poor, they may choose to support redistributive policies; and if there is greater mobility between the middle and the rich groups, they may support redistributive policies to a lesser extent (Kristov, Lindert, and McClellan 1992). Perotti (1996) in a cross-country comparison of inequality, social transfers, and economic growth concludes that income inequality is positively associated with social security and welfare expenditure, but is not statistically significantly related to health, housing and education expenditures as shares of GDP. Mayer (2001) in a state-level analysis finds that greater income inequality is not associated with an increase in AFDC spending, but is positively related to the number of AFDC recipients thus suggesting that the benefits per recipient declined. Furthermore, state expenditure on health care, secondary, and elementary schools increased with income inequality; however, post-secondary education expenditure shared a negative relationship with state-level income inequality.

Do public goods have a beneficial impact on individual health?

In this sub-section I discuss the existing literature with respect to whether public goods and government expenditures on health and education impact individual health. Individuals invest in their own health stock by combining their own time with market goods (Grossman 1972), and parents derive utility from and invest in the health and well-being of their children (Becker and Lewis 1973). Since education improves mothers' productivity and the availability of health care is likely to lower the cost of health inputs (e.g. time cost), it is plausible that the public provision of goods and services like health and education has a beneficial impact on child health. What follows is a brief description of studies which substantiate the claim that public goods lead to better child health.

In a county-level analysis, Grossman and Jacobowitz (1981) find that the availability of government subsidized family planning clinics have a large and statistically significant impact on

reducing neonatal mortality in the U.S. Increasing health services such as the addition of midwives to Indonesian villages had a positive effect on maternal body mass index and child birthweight (Frankenberg and Thomas 2001). Changes in Medicaid eligibility have lowered infant mortality rates in the U.S. partly through its effect on the probability of early prenatal care initiation and improved birthweights (Currie and Gruber 1996), and prenatal WIC participation is associated with greater adequacy of prenatal care and higher birthweight (Devaney, Bilheimer and Schore 1992).

In the U.S., the vast majority of elementary and secondary education is provided by the public sector. In addition to improving market earnings through its effect on own human capital (Mincer 1962; Becker 1964), education has a causal effect of improving individual health status (Behrman and Wolfe 1987; Berger and Leigh 1989; Grossman and Joyce 1989; Grossman and Kaestner 1997) and the likelihood of engaging in health behavior such as smoking, drinking and exercising (Kenkel 1991). Furthermore, parental educational attainment has been linked to improved child health outcomes (Edwards and Grossman 1979; Shakoto, Edwards and Grossman 1981; Wolfe and Behrman 1982; Grossman and Joyce 1989) measured as lower probability of LBW and infant mortality. See Wolfe and Zuvekas (1995) for an analysis of the non-market returns to education.

What have we learned so far about the relationship between income inequality and health?

A negative relationship between income inequality at the aggregate level, i.e. between geographic units, and average health in the communities has been consistently observed in the literature (Wilkinson 1992; Kaplan et al. 1996; Kennedy, Kawachi, and Prothrow-Stith 1996; Wagstaff and Doorslaer 2000). However, this relationship may simply be due to the concavity

of the health production function[2] (Gravelle 1998; Subramanian and Kawachi 2004), and cannot be assumed to hold true at the individual-level. Furthermore, this relationship may be explained at the aggregate or individual level by the level of income, as unequal societies may also be poorer societies. Thus, it is important to see if it is absolute income and not the distribution of income within the community that impacts individual health. In addition to income, the characteristics of the community of residence may confound the income inequality effect. Unequal communities may also be ones with different lifestyle choices, different racial, employment, occupation, and household composition characteristics due to factors correlated with but not caused by their inequality in income, compared to more equal communities. In the absence of adequate controls, high-income inequality may simply be picking up the effect of omitted variables that are negatively associated with health (Hustead 1991; Levernier, Rickman and Partridge 1995; Phelps 1997; Partridge, Partridge, and Rickman 1998; Meara 1999; Bernard and Jensen 2000)[3].

In addition to community characteristics, several studies have estimated whether the income inequality effect persists after controlling for individual income and other demographic characteristics (Fiscella and Franks 1997, 2000; Daly et al. 1998; Kennedy et al.1998; Soobadeer and LeClere 1999; Meara 1999; Deaton and Paxson 2001; Mellor and Milyo 2001, 2002; Mayer and Sarin 2006). The results from these studies are mixed – Mellor and Milyo (2002) for instance, find that the income inequality effect on self-rated health disappeared after controlling for household income. But in the Diez-Roux, Link and Northridge (2000) study, the adverse

[2] Assuming a concave relationship between individual income and individual health, if $x is transferred from the richest person to the poorest person in society (thus reducing inequality), then the poor person's health improvement will be more than the rich person's health deterioration, thereby leading to an improvement in the average health of society. Additionally, if the rich person's income-health association lies on the flat portion of the concave curve, then the health of the rich might not suffer appreciably as a result of this income transfer.

[3] A vast majority of these references were cited and surveyed in Mellor and Milyo (2002) and/or Subramian and Kawachi (2004).

effect of income inequality on depressive symptoms and self-rated health were attenuated but not removed upon the inclusion of household income.

A question that the income inequality literature brings up is -- what is the appropriate level of aggregation? Is it inequality at the country, state, MSA, census tract, city, or neighborhood level that matters to individual health? The answer will depend in part on how one thinks inequality causally affects health, and in part on what data are available. Within the U.S., most studies have focused on the effect of state-level inequality on individual health (Daly et al. 1998; Kennedy et al. 1998; Blakely et al. 2000; Diez-Roux, Link, and Northridge 2000; Kahn et al. 2000; Lochner et al. 2001; Mellor and Milyo 2002; Subramanian, Kawachi, and Kennedy 2001; Subramanian and Kawachi 2003, 2004). Some studies have considered the effect of inequality at lower levels of aggregation, i.e. census tracts (Soobader and LeClere 1999), counties (Fiscella and Franks 1997) and metropolitan areas (Mellor and Milyo 2002, Blakely et al. 2002, Sturm and Gresenz 2003). The results of these studies remain somewhat mixed.

According to Wilkinson (1997), the level of aggregation matters to determinations of the association between inequality and health. At higher levels of aggregation, i.e. within countries and states, income distribution is closely related to health, whereas income differences between states (and countries) do not affect health. Furthermore, smaller areas, such as metropolitan areas are homogenous and income distribution within these societies is not as important as income differences between them. Subramanian and Kawachi (2004) see two explanations for why studies find state-level associations but a weak relationship between inequality and individual health at lower levels of aggregation. First, one of the mechanisms through which inequality affects health might operate at the state-level, example, public expenditure on health care, education and welfare are determined by taxing and spending decisions at the state level.

Second, the authors point out that studies at lower levels of aggregation rely on smaller sample sizes and hence lack the statistical power to find a significant correlation between inequality and health. This analysis overcomes the problems associated with small sample size at sub state levels by using a census of births, and investigates the public goods mechanism at both the state and county levels where financing and redistribution decisions are made.

Method

In order to provide a comprehensive analysis of the link between income inequality and child health, and to shed light on the neo-materialist mechanism through which inequality affects health, I estimate three sets of regressions. The first estimates the relationship between income inequality and public goods. The second set of regressions tests the magnitude of the relationship between child health and public goods such as the supply of hospitals and hospital beds, and government expenditures on health and education. The final set of regressions examines whether the inclusion of public goods as explanatory variables changes the income inequality effect on birthweight. The public goods measures used in this analysis capture the resources allocated to improving the health and education of the people living in the community. The measures serve as a proxy for the general well-being of the members of society.

Income inequality is measured as the Gini coefficient. The conceptualization and measurement of inequality was first presented by Atkinson (1970), Sen (1973), and updated in Foster and Sen (1999). There are many different measures of income inequality – income share of the richest R%, income share of the poorest P%, 90-10 ratio, R%-P% ratio, Gini coefficient, Theil's measure of inequality, and the coefficient of variation to name a few (Fields 2001). Each measure varies in its sensitivity to changes in income distribution. The Gini coefficient is one-half of the arithmetic average of the absolute differences between all pairs of incomes in a

community, normalized by the mean income in the community. Furthermore, it has the desirable property that any income transfer from the rich to the poor suggests a reduction in inequality. The Gini coefficient is perhaps the most widely used measure of inequality, and I use it to measure inequality to allow comparisons with other published works. The Gini coefficient is computed as follows:

$$Gini = (1/2n^2\mu)\sum_{i=1}^{n}\sum_{i=1}^{n}| y_i - y_j |$$

Equation (1) represents the relationship between income inequality, Q, in community s, at time t and the level of public goods, P, in that community.

(1) $P_{st} = \beta_1 Q_{st} + \beta_2 Y_{st} + \beta_3 X_{st} + \varepsilon_s + \nu_{st}$

I begin by estimating the simple bivariate correlation at both the state and county levels between inequality and each measure of public good. I use several measures of public goods --health, education and hospital expenditures, and number of hospital beds in the community. Each of the measures is described in greater detail in the following section. I then add the median income in the community, Y, as a control as poorer communities may be both more unequal and have lower expenditures on public goods. X is a vector of exogenous community characteristics such as the racial, ethnic and age distribution, the unemployment rate and the percentage of single female and single male headed households within the community, which may be correlated with both inequality and government expenditures on health and education. I also control for the unobserved community culture by including community fixed-effects, and thus estimate the relationship between income inequality and public goods. β_1 may not be interpreted as a causal effect as long as there are other unobserved factors, such as the occupational distribution in the community which may be correlated with both inequality and public goods such as education that this analysis does not control.

Next, I estimate the relationship between public expenditures on health and education at the state and county level and individual birthweight. This relationship is assumed to take the following form:

(2) $H_{is} = \delta_1 P_s + \delta_2 Z_{is} + \delta_3 Y_s + \delta_4 X_s + \eta_{is}$

Where H represents the birthweight of child i in community s, δ_1 represents the relationship between public goods and child health, holding constant maternal and child characteristics, Z, median community income, Y, and other community characteristics X. Once again, I begin by estimating the bivariate correlation between public goods and health, and then add community and individual-level controls. I thus examine whether reducing the omitted variables bias mitigates the impact of public goods on health. State and county fixed-effects are added next to purge the income inequality effect of any time-invariant community characteristics, such as the cultural (ex. proclivity towards healthy behaviors) and political environment, that might impact child health. The final specification thus estimates the correlation between changes in public goods and changes in health. Although the empirical specification includes an expansive set of controls, this relationship may not be interpreted as a causal one as there may be unobserved factors (e.g. change in public awareness towards health and healthy behaviors over time) correlated with public goods and health that are not captured in this analysis.

The final set of regressions shed light on the mechanism through which income inequality affects health. I begin by testing whether inequality is correlated with birthweight. A negative correlation between income inequality and average health may simply be due to the concavity of the underlying health production function. The true effect of income inequality on aggregate health can only be identified after controlling for potential time invariant and community-specific covariates. Next, I include different measures of public goods in the

regression to test whether public goods explain the relationship between income inequality and birthweight. The supply of staffed hospital beds and government expenditures on health and education serve as proxies for well-being in the community.

The series of regressions are repeated to estimate the individual health equation where I also control for maternal characteristics such as age, race, education, prenatal smoking etc. that are likely to be related to birthweight The health production function of child i in community s is assumed to be of the following form:

(3) $H_{is} = \gamma_1 Q_s + \gamma_2 Z_{is} + \gamma_3 Y_s + \gamma_4 X_s + \gamma_s P_s + \vartheta_s + \upsilon_{is}$

If the introduction of P diminishes the coefficient on inequality relative to when the effect of public goods is assumed to be zero, this would indicate that the income inequality and health relationship acts, at least in part, through the effect of inequality on public goods. The income inequality effect can be interpreted as a causal one if: (a) income inequality is associated with decreased public goods, i.e. β_1 in equation (1) is negative, (b) public goods share a positive relationship with health, i.e. δ_1 in equation (2) is positive, and (c) the inclusion of public goods in the birthweight equation (3) reduces the magnitude of the inequality effect, γ_1.

Data Description

This study tests whether public goods and services provided at the state (county) level explain the relationship between income inequality within the state (county) and birthweight. The data for this analysis are drawn from several sources. What follows is a description of each of the data sources and definitions of the variables of interest:

Individual data: Child health, maternal characteristics and place of residence

The primary source of individual-level data for this study is the 1991 and 2001 Natality Detail Files. The Natality Detail Files provide information on the universe of live births in the U.S. The

analysis is restricted to1991 and 2001 due to data limitations posed by the availability of income inequality and community characteristics measures.

The Natality files are a compilation of birth certificate data and provide information on birth outcomes, parental demographics, medical risk factors associated with the pregnancy, prenatal care utilization and congenital abnormalities. The outcome of interest, birthweight, is reported by the physician attending the birth. Furthermore, detailed information on mothers' place of residence at the time of birth are provided – at the state-level, all 50 states and the District of Columbia are identified, and at the county-level, approximately 450 counties with a population of over 100,000 each are identified. There are approximately 4,000,000 live births in the U.S. every year, which yields an extraordinarily large sample for our analysis and requires a great deal of computing resources. The analysis is thus restricted to a 15% random sample of singleton children born in 1991 and 2001, which yields a sample of 1,138,082 births. The county-level analysis is restricted to those counties with at least 50 observations.

Income inequality data at the state and county levels

Income inequality is measured as the Gini coefficient at both the state and county levels. The 1990 and 2000 Decennial Censuses, specifically the 5% Integrated Public Use Microdata Series (IPUMS) identifies all states and the District of Columbia, and provides information on individual income earned in 1989 and 1999, respectively. The individual income information is used to construct the Gini coefficient at the state level, which captures income inequality in 1989 and 1999[4].

[4] The income data were calculated, topcoded and bottom coded as in Mayer and Sarin (2006). I correct for the topcoding of the income data in the IPUMS by summing the various components of each individual's income in the household. This provides greater variation at the upper tail of the income distribution than the topcoding in the IPUMS. I topcoded the household incomes for both 1990 and 2000 IPUMS by assigning all incomes that lie above the minimum (of 1990 and 2000) 99th percentile the median of all incomes that lie above the 99th percentile for both years. The negative values at the lower tail were bottom coded in a similar manner using the 1st percentile as the cutoff point.

The IPUMS data do not provide county identifiers on the public-use version of the file. Thus in order to construct the inequality measures at the county level I use the 1990 and 2000 Census Summary Files, which provides the household distribution over 16 household income groups for 1989 and 1999, respectively, based on 1-in-6 samples from the Decennial Censuses long form. Following McLaughlin and Stokes (2002) and Huynh et al. (2005) I assume that all households within an income bracket have the same level of household income, i.e. the midpoint of the income bracket, and estimate the level of income inequality within the county. This measure of income inequality at the county level will potentially underestimate inequality within the county as there is less variation in household income in the Summary Files.

Data on community characteristics at the state and county levels

Average characteristics of the states and counties are drawn from the Decennial Censuses, specifically the 1990 and 2000 Census Summary Files. The Census Summary Files provide state and county level information on population, income, race, ethnicity, household composition and housing. Median family income within states and counties serve as one of the community-level controls. Other controls in the models are the racial and ethnic composition, the education (fraction 25 years or more with at least a college degree), and stability in the community (percentage of owner occupied homes that have been occupied for at least five years). The fraction of single female-headed households and fraction of single male-headed households in the states and counties control for family composition.

Health and education expenditures at the state and county levels

Health and education expenditures serve as proxy for the general well-being in the community. The Annual Survey of Government Finances conducted by the Census Bureau gathers information from states and local governments. The Census Bureau provides yearly summaries

of finances for each state, which include -- revenue by type, expenditure by object and function, indebtedness by term, and assets by purpose. In this analysis I use the states' general expenditures[5] on health[6], hospitals[7] and education[8] per capita as the measures of states' provision of public goods. Data are available for all states for 1992-2003. Since state finance data are not available for 1990, I use the 1992 report of state finances as a proxy for 1990 expenditures.

For health expenditures at the county level I use the 2004 Bureau of Health Professions (BHPr) Area Resource File (ARF), which yields information on the per capita hospital expenditures for short-term general hospitals[9] in each county for 1990 and 2000. The analysis employs data on expenditures for short-term general hospitals (as opposed to specialty or long term hospitals) as it is likely to be the source of care for the vast majority of people within a county. This is not an ideal measure of public goods as it includes expenditures reported by all hospitals, regardless of ownership. Data on county expenditures on public elementary-secondary education are obtained from the 1992 and 2000 Annual Survey of Government Finances. The public elementary-secondary education finances data are available at the independent and

[5] General government category covers all government activities not included in the utilities, liquor stores, and insurance trust categories.
[6] Health expenditures by states include expenditures on providing health care to veterans (other than hospital care), services for the improvement and conservation of public health (including monitoring cleanliness and sanitation, environmental health, health programs for tuberculosis, maternal and child health, immunization, outpatient health clinics, and WIC and EPA activities).
[7] General expenditures on hospitals include state spending on – providing medical care to veterans, mentally and physically handicapped and government operated general hospitals including maternity and children's hospitals.
[8] Education expenditure by states includes spending on the following: activities and facilities related to state institutions of higher education; operation, maintenance and construction of public elementary, secondary and vocational education; direct cash payments for tuitions, scholarships and financial aid; special education and libraries.
[9] Short-term general hospitals are defined as those hospitals that provide non-specialized care where the majority of patients stay for less than 30 days.

dependent school district levels[10]. I summarize the per pupil spending[11] within each school district at the county level to measure the county expenditure on elementary-secondary education.

Health facilities at the state and county levels

Data on the availability of health resources, including community hospitals, health care providers, and staffed hospital beds are contained in the 2004 ARF. These data are available at the county level which I sum to the state level. I measure the availability of public goods as the per capita number of hospital beds in the county (state) in 1990 and 2000. In order to estimate the relationship between inequality within the county (state) and the public provision of health care facilities, it would be ideal to have data on county (state) owned hospitals. However, ARF, which is perhaps the most comprehensive source of public-use data on the availability of health resources, does not distinguish hospitals based on ownership. In 2005, the total number of hospitals in the U.S. was 5,759 of which 4,919 were community hospitals[12]; approximately 60% of community hospitals were non-government non-profit hospitals, 22% of the community hospitals were state or local government owned, and the remaining 18% were for-profit investor owned hospitals[13]. This suggests that the vast majority of short-term general hospitals are likely to be government or non-government non-profit hospitals, and although not perfect, these variables measure the supply of public goods in the community.

[10] Independent school districts are distinct governments that are fiscally and administratively independent of any other government. Dependent school districts lack sufficient autonomy and are considered to be a part of another government – state, county, municipality or township.

[11] Public school spending includes -- direct expenditure for salaries, employee benefits, purchased professional and technical services, purchased property and other services, and supplies. It includes gross school system expenditure for instruction, support services, and non-instructional functions, payments made by the state government on behalf of school systems, and transfers made by school systems into their own retirement funds. This classification is used only in Census Bureau education reports to enable interstate comparisons.
http://ftp2.census.gov/govs/school/00fullreport.pdf

[12] Community hospitals are non-federal short-term general and specialty hospitals.

[13] American Hospital Association, Fast Facts, Web content accessed on June 30, 2006
http://www.aha.org/aha/resource_center/fastfacts/fast_facts_US_hospitals.html

Table 1 contains the means and standard deviations of the variables of interest. Descriptive statistics reveal that the average birthweight of infants in the 1991 and 2001 samples combined is 3,350 grams. Inequality rose at both state and county level, a pattern that is in keeping with the inequality trend in the U.S. (Johnson, Smeeding, and Torrey 2005). The proportions of single female-headed households and college educated individuals also increased between 1991 and 2001. In the combined sample, the average number of short-term general hospital (STGH) beds is 0.0034 per capita, and the average STGH expenditures per capita is approximately $1,050 ($1,200) at the state (county) level.

Table 2 presents the Gini coefficient for all 50 states and the District of Columbia to provide a sense of which states are more unequal, and to demonstrate the change in inequality between the two periods. Alaska, New Hampshire and Utah are the states with the three lowest levels of inequality in both years, and the District of Columbia appears to be the most unequal in both 1990 and 2000. This table also reveals that state inequality rankings have not changed appreciably over the decade.

Results

This section presents the results for the three sets of regressions described earlier in the paper. Ordinary Least Squares is used to estimate the relationship between income inequality and public goods, public goods and health, and income inequality and health. Standard errors are clustered at the state (county) level when income inequality and public goods are measured at the state (county) level. Select regression coefficients are presented in each of the tables; the complete set of results is available upon request. Table 3 contains the correlations between state (county) inequality and each of the public goods measures at the state (county) level used in this analysis. Each pair of OLS coefficient on income inequality and its associated standard error reported in

Table 3 is derived from a separate regression. Column 1 contains the correlations controlling for year fixed-effects, and column 2 contains the correlations controlling for community characteristics, and community and year fixed-effects. Income inequality is positively and statistically significantly correlated with the number of STGH beds per capita at both the state and county level, a relationship that is not statistically significant and small (0.0001) after controlling for community characteristics. STGH expenditures per capita at the state level shares a positive relationship with inequality, however this relationship is not statistically significant at conventional levels. The coefficients on the state general expenditure on education (-0.042), and on the state general expenditure on hospitals (0.0102) are statistically significant at the 0.1 and 0.05 levels, respectively. The inclusion of community controls and community fixed effects reduces the magnitudes of correlations between inequality and public goods. With the exception of STGH expenditures per capita and elementary-secondary spending per pupil, all public goods are positively related to income inequality. However, none of the correlations between inequality and expenditures on health and education are statistically significant. This is not surprising since the community controls in this model such as the racial composition and proportion of single parent households are likely to be highly collinear and correlated with inequality. Thus from Table 1 I conclude that the number of STGH beds, and general expenditures on hospitals are positively correlated with inequality, whereas education expenditures are negatively correlated with inequality. These findings are consistent with Mayer and Sarin (2006) and Kaplan et al. (1996).

Table 4 presents the results of the regressions that estimate the relationship between public goods and health. The table is divided into two horizontal panels -- the top panel contains the results of the state-level analysis, and the bottom panel the results of the county-level

analysis. The sample size is smaller for the county-level regressions as individuals who live in counties with less than 100,000 people are not identified in the data. Furthermore, I have excluded counties with fewer than 50 observations in the sample. Column 1 presents the correlation between public goods and health, and subsequent columns present the correlations controlling for community characteristics, community fixed-effects and individual characteristics such as child's sex and maternal demographics. The correlation between the number of STGH beds and birthweight are positive and large, but imprecisely estimated at the state level and the coefficients are statistically insignificant at conventional levels. At the county level, the number of STGH beds shares a large and negative relationship with birthweight (17,202)[14], however, the inclusion of community controls reduces the size of this correlation five-fold. Controlling for individual controls further reduces the size of this association (2,285), and the coefficient is no longer statistically significant at conventional levels. The correlation between the current expenditures on elementary-secondary education programs and birthweight are positive and statistically significant at both the state and county levels. The magnitude of the association with and without the controls remains fairly similar, and a $1 increase in per pupil spending is associated with a 15 (6) gram increase in birthweight at the state (county) level. Finally, although the state general expenditure on hospitals shares a positive and statistically significant relationship (109.7) with birthweight, the relationship between general expenditure on education and birthweight is negative and statistically insignificant at conventional levels. To summarize the findings from Table 4, with the exception of STGH expenditures and state general expenditures on education per capita, all other measures of public goods are positively associated

[14] At first glance the size of this association seems too large; however, when interpreted in light of the fact that mean number of hospital beds per capita is 0.0034 with a standard deviation of 0.001, the coefficient does not seem unreasonable. In fact, the coefficient suggests that a one standard deviation increase in number of STGH beds per capita is associated with a 17 gram decrease in birthweight.

with health; of these, public goods measured as state expenditures on hospitals and per-pupil spending on primary-secondary education share a statistically significant relationship with birthweight.

The inequality-birthweight relationship is explored in Table 5. I begin by testing whether average birthweight shares an inverse relationship with inequality. Consistent with prior findings, Table 5 reveals a negative association between inequality and health in general- that higher inequality at the state or county level is associated with worse health on average. Controlling for community characteristics diminishes the magnitude of this relationship, and including all the measures of public goods as controls increases the size of the association. Although statistically insignificant, column 4 shows that a unit increase in the state (county) Gini coefficient is associated with a 10.7 (427.3) decrease in average birthweight. Since inequality is associated with greater number of hospitals and hospital expenditures, which in turn share a positive relationship with aggregate health, column 4 results suggest that had inequality not increased the number of hospitals and hospital expenditures inequality would be worse for average birthweight. To the extent that inequality causally raises public goods, specifically the number of hospital beds and hospital expenditures, these results suggest that inequality-birthweight relationships that do not control for public goods most likely underestimate the negative effect of inequality on birthweight.

Columns 5-8 present regression results which test whether there is any evidence that income inequality at state and county levels affect individual birthweight. The upper panel of column 5 reveals that absent any controls, a unit increase in the state Gini coefficient is associated with a 12 gram decrease in birthweight. Including time variant and invariant community controls, as well as individual controls increases the magnitude of the relationship

between state-level inequality and birthweight to 13 grams. It is interesting to note that the income inequality effect persists after controlling for an extensive list of control including state characteristics that vary over time, individual and maternal characteristics (along with various combinations of interactions between maternal race, age, education and marital status), as well as state and year fixed-effects. Including measures of public goods leads to a further increase in the size of the coefficient on income inequality, thus suggesting that a unit increase in the Gini coefficient is accompanied by a 22.6 gram statistically significant decrease in birthweight. Alternatively stated, increasing state income inequality by one standard deviation (1.81) is associated with a 40.9 gram decrease in birthweight. Controlling for the level of inequality, increasing the number of hospital beds per capita by one standard deviation is accompanied by a 31.7 gram increase in birthweight, and a dollar increase in per-pupil spending at the state (county) level is associated with a 13.4 (4.8) gram increase in birthweight. As observed in the aggregate state-level analysis, the individual-level analysis also suggests that state expenditures on hospital that increase with increased inequality reduce the detrimental effect of inequality on birthweight. I do not interpret the relationship between income inequality and public goods as a causal one, however, the results suggest that estimates of inequality effect on birthweight that do not control for the number of hospitals and hospital expenditures most likely underestimate the adverse effect of inequality on birthweight. To the extent that inequality raises the provision of hospitals and hospital expenditures, these results suggest that public goods are likely to dampen the adverse of income inequality on birthweight.

The lower panel presents the results of the county-level inequality analysis. The correlation between the county Gini coefficient and individual birthweight is large (1,231.7), negative and statistically significant at the 0.01 level. However, including county and individual

characteristics as controls greatly reduces the magnitude of the correlation and renders it statistically insignificant. Including public goods in the birthweight equation further diminishes the inequality coefficient. The standard errors associated with the inequality coefficients are large and meaningful interpretations of the inequality effect are not possible. This is most likely because county inequality measures are constructed using summarized income data which provides insufficient variation in income to capture the full effect of the distribution of income on birthweight.

Taken together, the results of the state-level analysis presented in Tables 3-5 reveal that public goods are associated with better health, and inequality is positively related to state expenditures on hospitals which improve the general well-being in the community. This coupled with the fact that the negative inequality effect on individual birthweight strengthens after controlling for public goods suggests that public goods, as measured in this analysis, may reduce the detrimental effect of inequality on birthweight.

Conclusions

It is well established in the economics literature that income and socioeconomic status (SES) enter the child health production function and offer protective benefits to health. What is debated is whether the distribution of income in ones community, i.e. income inequality has a detrimental affect on health outcomes. The literature conjectures that public goods or social spending is one of the mechanisms by which inequality impacts health, however, few studies have tested this hypothesis. The intuition behind this argument is that unequal societies are also unhealthier perhaps because the rich are unwilling to support policies or subsidize public goods that they are unlikely to benefit from or use. This paper estimates the relationship between income inequality (at both the state and county levels) and birthweight. It explores whether

government spending on health and education, and the supply of health facilities, i.e. public goods that are likely to have a beneficial impact on the health and well-being of individuals, is the causal link between income inequality and birthweight.

In order to examine the neo-materialist relationship between income inequality and birthweight, I estimate three sets of regressions. The first set of regressions measures the correlation between income inequality and public goods, the second estimates the public goods-health relationship and the final set of regressions test whether the income inequality-health correlation persists after controlling for public goods. At the county level, results are inconclusive as there is insufficient variation in the inequality measure due to data limitations. At the state level, on the other hand, I find that income inequality is associated with higher expenditures on hospitals and a greater supply of hospitals; and as expected, public goods share a positive relationship with health. Controlling for public goods does not mitigate the relationship between income inequality and birthweight. In fact, the inequality coefficient is strengthened after including public goods in the model. If we believe that income inequality causes an increase in public goods provision, the results of this analysis provide preliminary evidence that increases in hospitals and hospital expenditures, my proxy for measuring the general welfare of the community, dampen the negative effect of income inequality on health. In the absence of this increase in public goods, the effect of income inequality on health would be worse. Studies that do not control for provision of public goods are likely to underestimate the income inequality effect on birthweight.

Table 1: Descriptive Statistics, 1991 and 2001 Natality Detail Files

Sample Means and (Standard Deviations in Parentheses)

	All		1991 Sample		2001 Sample	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Sample size	1,138,082		572,976		565,106	
Mean birthweight (grams)	3,350.20	(575.84)	3,359.92	(579.68)	3,340.34	(571.75)
Percent females	48.86	(49.99)	48.95	(49.99)	48.78	(49.99)
Mother's Characteristics						
Mean age at child birth	26.79	(6.01)	26.39	(5.82)	27.19	(6.16)
Mean years of education	12.63	(2.79)	12.42	(2.72)	12.83	(2.83)
Percent White	79.46	(40.40)	78.99	(40.74)	79.94	(40.04)
Percent Black	15.79	(36.47)	16.54	(37.16)	15.03	(35.74)
Percent other race	4.75	(21.26)	4.46	(20.65)	5.03	(21.86)
Percent Hispanic	18.49	(38.82)	15.54	(36.23)	21.48	(41.07)
Percent married	68.62	(46.40)	70.58	(45.57)	66.63	(47.15)
Percent foreign born	19.46	(39.59)	16.35	(36.98)	22.61	(41.83)
Percent MSA residents	81.16	(39.10)	79.97	(40.02)	82.37	(38.11)
State Characteristics						
Average inequality (Gini coefficient)	43.77	(1.81)	43.13	(1.65)	44.42	(1.73)
Average median family income (1,000s 2000$)	47.04	(6.56)	45.19	(6.73)	48.91	(5.81)
Percent Black	12.14	(7.65)	12.07	(7.41)	12.21	(7.89)
Percent Hispanic	11.57	(10.98)	9.87	(9.87)	13.30	(11.75)
Percent single male headed households	5.31	(1.04)	4.63	(0.85)	5.99	(0.72)
Percent single female headed households	16.65	(2.32)	16.02	(2.12)	17.29	(2.34)
Percent 25+ with college degree or more	22.34	(4.13)	20.34	(3.42)	24.37	(3.78)
Percent homes occupied for 5+ years	50.55	(5.80)	50.41	(6.27)	50.69	(5.29)
Average no. short-term general hospital beds per-capita	0.0034	(0.001)	0.0039	(0.001)	0.0029	(0.001)
Average short-term gen. hospital expenditures/capita (1,000s)	1.05	(0.26)	0.83	(0.11)	1.27	(0.18)
Average general expenditures on education per capita	1.04	(0.28)	0.84	(0.15)	1.24	(0.23)
Average general expenditures on hospitals per capita	0.11	(0.05)	0.10	(0.04)	0.12	(0.06)
Average general expenditures on health per capita	0.12	(0.05)	0.09	(0.03)	0.15	(0.06)
Average curr. spending on elem.-sec. prog./pupil (1,000s)	5.90	(1.62)	4.93	(1.19)	6.88	(1.39)
County Characteristics						
Average inequality (Gini coefficient)	0.41	(0.03)	0.40	(0.03)	0.41	(0.03)
Average median family income/1,000 (2000 $)	50.69	(11.03)	48.90	(10.15)	52.48	(11.56)
Percent Black	13.78	(12.52)	13.91	(12.26)	13.66	(12.78)
Percent Hispanic	14.53	(15.59)	12.65	(14.48)	16.40	(16.41)
Percent single male headed households	5.66	(1.47)	5.03	(1.34)	6.30	(1.31)
Percent single female headed households	18.18	(5.88)	17.70	(5.78)	18.66	(5.94)
Percent 25+ with college degree or more	24.86	(8.07)	22.66	(7.00)	27.06	(8.46)
Percent homes occupied for 5+ years	48.85	(7.69)	48.58	(8.22)	49.12	(7.11)
Average no. short-term general hospital beds per-capita	0.0035	(0.002)	0.0040	(0.002)	0.0029	(0.002)
Average short-term gen. hospital expenditures/capita (1,000s)	1.20	(0.74)	0.97	(0.53)	1.42	(0.85)
Average curr. spending on elem.-sec. prog./pupil (1,000s)	6.11	(1.74)	5.19	(1.37)	7.03	(1.59)

Notes:

State Gini coefficient constructed from the 1990 and 2000 5% IPUMS; county Gini coefficient constructed from 1990 and 2000 Decennial Censuses; state and county demographic, education, household characteristics obtained from the 1990 and 2000 Dencennial Censuses

Table 2: Gini Coefficients and Inequality Ranking, by State and Year

	1990		2000	
	Gini Coeff	Rank	Gini Coeff	Rank
US	0.424	-	0.437	-
Alabama	0.455	47	0.465	47
Alaska	0.385	2	0.399	1
Arizona	0.431	35	0.440	30
Arkansas	0.447	44	0.450	39
California	0.429	33	0.455	43
Colorado	0.418	23	0.427	19
Connecticut	0.420	25	0.444	32
Delaware	0.398	5	0.416	7
District of Columbia	0.482	51	0.518	51
Florida	0.436	38	0.455	41
Georgia	0.440	40	0.449	38
Hawaii	0.401	7	0.429	21
Idaho	0.410	14	0.419	13
Illinois	0.431	36	0.438	28
Indiana	0.405	11	0.416	8
Iowa	0.408	13	0.407	5
Kansas	0.424	28	0.426	18
Kentucky	0.451	46	0.460	45
Louisiana	0.472	50	0.473	49
Maine	0.403	8	0.430	24
Maryland	0.404	9	0.421	14
Massachusetts	0.425	29	0.447	35
Michigan	0.426	30	0.429	20
Minnesota	0.413	18	0.414	6
Mississippi	0.467	49	0.469	48
Missouri	0.433	37	0.437	26
Montana	0.415	19	0.429	23
Nebraska	0.410	15	0.418	9
Nevada	0.411	16	0.419	12
New Hampshire	0.379	1	0.405	3
New Jersey	0.422	27	0.439	29
New Mexico	0.437	39	0.452	40
New York	0.457	48	0.474	50
North Carolina	0.426	31	0.441	31
North Dakota	0.416	20	0.423	15
Ohio	0.421	26	0.432	25
Oklahoma	0.444	41	0.448	37
Oregon	0.417	21	0.429	22
Pennsylvania	0.430	34	0.444	33
Rhode island	0.419	24	0.447	36
South Carolina	0.427	32	0.445	34
South Dakota	0.412	17	0.424	16
Tennessee	0.446	43	0.455	42
Texas	0.450	45	0.456	44
Utah	0.390	3	0.402	2
Vermont	0.392	4	0.418	10
Virginia	0.418	22	0.437	27
Washington	0.407	12	0.425	17
West Virginia	0.445	42	0.461	46
Wisconsin	0.400	6	0.405	4
Wyoming	0.405	10	0.419	11

Notes:

State-level Gini coefficients were constructed from the 1990 and 2000 Decennial Censuses IPUMS

Table 3: Relationship Between Income Inequality (Gini Coefficient) and Public Goods
OLS Coefficients on Gini Coefficient and (Standard Errors in Parentheses)

	(1)	(2)
Dependent Variables:		
State-Level Public Goods		
No. short-term general hospital beds per-capita	0.00012**	0.0001
	(0.0001)	(0.0001)
Short-term gen. hospital expenditures/capita (1,000s)	0.0161	-0.0243
	(0.0101)	(0.0466)
General expenditures on education per capita	-0.042*	-0.0106
	(0.0225)	(0.0943)
General expenditures on hospitals per capita	0.0102**	0.0202
	(0.0039)	(0.0202)
General expenditures on health per capita	-0.0043	0.0047
	(0.0039)	(0.0259)
Curr. spending on elem.-sec. prog./pupil (1,000s)	-0.1300	0.0657
	(0.1023)	(0.1911)
County-Level Public Goods		
No. short-term general hospital beds per-capita	0.0399***	0.0101
	(0.0031)	(0.0099)
Short-term gen. hospital expenditures/capita (1,000s)	13.2702***	-6.9243
	(1.2037)	(4.4369)
Curr. spending on elem.-sec. prog./pupil (1,000s)	-6.0902***	0.7655
	(2.2929)	(6.5059)

Notes:
Each pair of OLS coefficient and s.e. derived from a separate regression
Column (1) contains OLS coefficients on Gini coefficient, with year fixed-effects
Column (2) contains OLS coefficients on Gini coefficient, controlling for community characteristics -- % Black, % Hispanic, % Single male headed hh, % Single female headed hh, % 25+ w/ college degree or more, % homes occupied 5+ years, and year and community fixed-effects
Standard errors clustered at the community level
*(**)(***) represent statistical significance at the 0.1(0.05)(0.01) levels, respectively

Table 4: Relationship Between Public Goods (State and County Levels) and Birthweight, 1991 and 2001
OLS Coefficients and (Standard Errors in Parentheses)

	(1)	(2)	(3)	(4)
State-Level Public Goods				
No. short-term general hospital beds per-capita	-8,063.49	839.82	-1,660.98	7,722.68
	(10,890.37)	(6,920.65)	(9,205.49)	(11,353.41)
Short-term gen. hospital expenditures/capita (1,000s)	-9.47	41.33	-23.23	-36.42
	(49.26)	(34.49)	(25.23)	(31.12)
General expenditures on education per capita	43.48	-10.06	-0.83	-7.95
	(28.87)	(24.51)	(12.34)	(15.29)
General expenditures on hospitals per capita	-191.29	96.36	140.51**	109.70*
	(115.87)	(95.56)	(54.38)	(56.46)
General expenditures on health per capita	138.50	258.98*	-18.69	5.78
	(125.62)	(138.82)	(69.44)	(79.94)
Curr. spending on elem.-sec. prog./pupil (1,000s)	11.30**	1.98	11.03*	15.06**
	(5.59)	(5.51)	(5.91)	(7.13)
Sample size	1,138,082	1,138,082	1,138,082	1,138,082
County-Level Public Goods				
No. short-term general hospital beds per-capita	-17,202.24***	-6,465.13***	-3,942.85**	-2,285.83
	(2,433.43)	(1,454.21)	(1,957.51)	(1,882.56)
Short-term gen. hospital expenditures/capita (1,000s)	-7.69	5.49	8.22*	6.51
	(6.13)	(4.28)	(4.56)	(4.55)
Curr. spending on elem.-sec. prog./pupil (1,000s)	7.50***	5.92***	4.41	6.02*
	(1.75)	(1.95)	(3.79)	(3.47)
Sample size	801,769	801,769	801,769	801,769
Community Controls	No	Yes	Yes	Yes
Individual Controls	No	No	No	Yes
Community Fixed-effects	No	No	Yes	Yes

Notes:
Community controls include: % Black, % Hispanic, % Single male headed hh, % Single female headed hh, % 25+ w/ college degree or more, % homes occupied 5+ years, and year fixed-effects
Individual controls include: child sex, mother's age, years of education, race and ethnicity, marital status, foreign born status and MSA residence status
*(**)(***) represent statistical significance at the 0.1(0.05)(0.01) levels, respectively

Table 5: Relationship Between Income Inequality and Birthweight -- With and Without Public Goods, 1991 and 2001 Natality Detail Files

OLS Coefficients and (Standard Errors in Parentheses)

	Average Birthweight				Individual Birthweight			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
State-Level Public Goods								
Gini coefficient	-16.38***	3.35	-2.80	-10.74	-12.02***	-13.36***	-12.95***	-22.61***
	(3.43)	(4.22)	(7.83)	(8.42)	(3.38)	(3.72)	(4.67)	(7.33)
No. short-term general hospital beds per-capita				23,524.69				31,721.07***
				(22,114.43)				(11,760.93)
Short-term gen. hospital expenditures/capita (1,000s)				-61.45				-93.10***
				(43.38)				(31.24)
General expenditures on education per capita				18.51				-1.07
				(24.92)				(12.48)
General expenditures on hospitals per capita				164.13				65.58
				(103.18)				(62.00)
General expenditures on health per capita				-149.51				-89.77
				(134.31)				(98.75)
Curr. spending on elem.-sec. prog./pupil (1,000s)				20.13				13.43**
				(13.09)				(6.10)
Sample size	100	100	100	100	1,138,082	1,138,082	1,138,082	1,138,082
County-Level Public Goods								
Gini coefficient	-1,256.26***	-267.83*	-446.39	-427.26	-1,231.73***	-549.49	-258.47	-222.77
	(93.49)	(138.95)	(540.67)	(547.36)	(141.33)	(360.49)	(295.94)	(291.94)
No. short-term general hospital beds per-capita				-1,562.71				-799.90
				(3,198.59)				(1,847.08)
Short-term gen. hospital expenditures/capita (1,000s)				0.96				7.05
				(07.95)				(4.84)
Curr. spending on elem.-sec. prog./pupil (1,000s)				4.26				4.78
				(05.66)				(3.67)
Sample size	846	846	846	846	801,769	801,769	801,769	801,769
Community Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Individual Controls	No	No	No	No	No	No	Yes	Yes
Community Fixed-effects	No	No	Yes	Yes	No	Yes	Yes	Yes

Notes:

Community controls include: % Black, % Hispanic, % Single male headed hh, % Single female headed hh, % 25+ w/ college degree or more, % homes occupied 5+ years, and year fixed-effects

Individual controls include: child sex, mother's age, years of education, race and ethnicity, marital status, foreign born status, MSA residence status, mother's age*race, race*marital status, race*education and education*marital status.

*(**)(***) represent statistical significance at the 0.1(0.05)(0.01) levels, respectively

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