Responsibility for Equity: Can the Public Sector Leverage Social Equity in Health Care?

Ling Zhu  
Department of Political Science  
Texas A&M University and University of Houston  
lingzhu@polisci.tamu.edu

and

Morgen Johansen  
Public Administration Program and Public Policy Center  
University of Hawaii, Manoa  
morgen.johansen@hawaii.edu

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Abstract

In this manuscript, we explore the link between the publicness of organizations and social equity. Focusing on state health care systems in the U.S., we examine two theoretical dimensions of publicness: ownership of the system and source of financial resources. We then empirically assess if the publicness of a state’s system leads to more equal access to health care. Pooling data for 50 states from 1990 to 2006, we find overall that the publicness of a state’s health care system is positively associated with more equal access to health care. The two dimensions of publicness, however, do not exhibit the same impact on health care access. Public ownership has a positive and moderate effect on equal access to health care. Public finances and resources may have a positive effect on equity depending on different spending venues. Our study suggests that because publicness is a multi-faceted concept, more nuanced research is needed on the relationship between the different dimensions of publicness and social equity.
Introduction

Comparisons between public and private organizations continue to be of interest to researchers in the field of public administration (Anderson and Jorgensen 1997; Bozeman and Bretschneider 1994; Frederickson 1993; Perry and Rainey 1988; Moulton 2009). While most students in public administration and public management continue to debate the extent to which public and private organizations differ, a few scholars have proposed moving the theoretical discussion in a different direction: assessing and comparing the relative effectiveness—in terms of outputs and outcomes—of public and private organizations (Meier and O’Toole 2011). We commend this emphasis on public outcomes and contend that there is more to the “publicness puzzle” than evaluating the blurring lines between organizations. The puzzle is not simply about how we can categorize different organizations and policy systems. Instead, it is about determining to what extent our knowledge about the publicness of organizations and policy systems can “lend insights to understanding and managing public outcomes” (Moulton 2009, 889).

What are desirable policy outcomes? In the theory and practice of public administration, scholars and practitioners have long emphasized management science, rationality, policy efficiency, and making economical decisions (Frederickson 1990). A few decades ago, the new public administration movement placed social equity as a third pillar of public administration behind efficiency and economy (Frederickson 2005). Social equity is important in guiding public administrators through the challenges they face in trying to find a balance between the other two pillars of economy and efficiency. Social equity is defined as “equality in government

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1 The argument behind this third pillar of equity is that equity is the basis for a just, democratic society (Frederickson 2005). For the private sector, the goals are decidedly on profit and efficiency. But in public organizations, social equity is equally important as efficiency and economy. Goals will affect decision-making and thus outcomes. For example, the decision to provide public provision or privatization of public services forces managers to weigh efficiency with equity. Privatization addresses the efficiency goal by not the equity goal. Public provision addresses the equity goal but not the efficiency goal (Warner and Hefetz 2002).
services, responsibility for decisions and program implementation for public managers, and responsiveness to the needs of citizens.” (Frederickson 1990, 228-229). Social equity is a desirable policy outcome.

In this paper, we explore the link between publicness and organizational effectiveness by focusing our analysis on social equity as an organizational outcome. We outline a framework for assessing how a state health care service delivery system is organized along two dimensions of publicness and develop the theoretical mechanisms by which these dimensions may affect social equity. We then proceed with an empirical and timely analysis of public health care in the United States. We seek to assess whether the publicness of a state’s health care system generates more social equity in health care. The empirical analysis draws on a comparison of all 50 American states from 1990-2006. We evaluate two core dimensions of the publicness of state health care systems, ownership and financial resources, and their relationship with social equity outcomes.

**Linking the Publicness Puzzle to Social Equity**

The traditional approach to theorizing about organizational publicness relies on assessing how organizational activities are controlled. The traditional or “core” approach (200) focuses on distinctive legal types (government-owned vs. private/market-owned) of organizations (Bozeman and Bretschneider 1994). Bozeman (1984, 1987) proposed a dimensional approach to publicness as an alternative to the core approach. According to his conceptualization, all organizations are to some extent public; the publicness of an organization is independent from its legal status (Bozeman 1984).

Bozeman and Bretschneider (1994) identify four dimensions of organizational publicness: goal and agenda publicness, resource publicness, communications publicness, and
the core dimension of ownership (see also Perry and Rainey 1988). Using this basic framework, scholars have agreed on three predominant criteria for measuring publicness and examining how levels of publicness affect organizational behaviors (Rainey and Bozeman 2000). The three criteria are: ownership (defined by some public-oriented purposes and goals), financial resources (defined by government financing), and the model of social influence or political control (defined by legal rules and/or procedures or behaviors for bureaucratic oversight) (Rainey and Bozeman 2000). These dimensions of publicness are “not mutually exclusive but rather complementary variables that identify the important and independent nature and degree of an organization’s publicness” (Heinrich and Fournier 2004, 51).

The dimensional approach to organizational publicness has fostered various empirical studies that compare organizational behaviors in the different publicness dimensions. Although there is consensus in the literature that public organizations have more complex goals, more red-tape rules, and more goal ambiguity (Baldwin 1987; Boyne 2002; Chubb and Moe 1988; Nutt and Backoff 1993 Solomon 1986), very few systematic studies link publicness and organizational outcomes (Rainey and Bozeman 2000; Anderson and Jorgensen 1997; Kurland and Egan 1999; Scott and Falcone 1998; Emmert and Crow 1988). Among the few studies that do explore how organizational publicness affects organizational behaviors and outcomes, the empirical focus is on how managers and organizational members behave in public versus private contexts. The primary focus of the existing empirical literature has not focused on outputs or whether these outputs realize some public value or serve certain public purposes.

More recently, researchers have begun to link publicness to organizational outcomes. These studies find that equity outcomes are valued more by the public sector than the private sector.

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2 Political control is the least clear dimension out of the three and is a challenging concept to measure.
3 In the Bozeman framework, ownership publicness is not simply defined by organizations’ legal status; rather, it is measured by how much organizations integrate public values into their organizational goals (Bozeman 2002).
sector. For example, Amirkhanyan et al. (2008) compare how the public sector differs from the private sector in their performance of nursing home management. They use both quality and access to care as performance measures and find that public and non-profit nursing homes outperform their for-profit counterparts in providing care to economically marginalized citizens. Andrews and Entwistle (2010) find that public-public partnerships are better than public-private partnerships in terms of enhancing public service effectiveness, efficiency, and equity in the UK. Defining equity outcomes based on “the extent to which service departments are distributing services to disadvantaged, underrepresented, and hard-to-reach groups” (686), they find that public-private partnerships are negatively associated with equity outcomes.

One common theoretical implication of these studies is that the publicness of a service delivery system is a key institutional factor in explaining social equity. Unfortunately, these studies do not directly link publicness as defined by Bozeman’s framework and social equity. In short, there remains an unsolved puzzle about how dimensional publicness affects organizational outputs and outcomes regarding equity.

Another theoretical implication that occurs when we consider Bozeman’s dimensional framework and these studies is that public outcomes are often attached to particular values. While profits or efficiency may be primary concerns of more private organizations, equity may be emphasized more when organizations or open systems of networks are more public. We may see the distinctiveness of values in services and products provided by public organizations or service systems that focus on providing care to underrepresented citizens. The public-private division therefore, is not about legal types of an organization, but about distinctive institutional arrangements, goals for producing public outcomes, and preferences on whose needs should be addressed. In sum, it is a plausible theoretical expectation that a more public service system will
emphasize providing services to all citizens than a service system that is for-profit and/or more market-oriented. The dimensional publicness framework provides theoretical support for linking organizational and institutional characteristics to equity outcomes. In the next section we present a theoretical framework to explore the relationship between dimensional publicness and equity in the context of U.S. health care service delivery systems.

**Dimensional Publicness and Equity in U.S. Health Care**

Provision of health care services is an excellent policy issue area in which to examine how the publicness of organizational and institutional service delivery systems may affect equity. Health services in many developed countries have come under critical scrutiny in recent years because of the challenges associated with balancing efficiency, economy, and equity (Scott 2001). In the United States particularly, the challenge arises from concerns about both reducing health care costs and improving the equality of access. Among other things, the existence of a large uninsured population in the U.S. is a serious public concern about health care equity.\(^5\)

Although unequal access to health care has been well documented in the scholarly literature, most discussions of health care inequality have tended to ignore or rarely touch upon the organizational goals and characteristics of the service delivery systems that may affect health care inequality. Discussions about health care inequality in the U.S. tend to focus on socioeconomic conditions, such as income inequality (Mellor and Milyo 2001), education

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\(^5\) The U.S. Census Bureau estimates that in 2009, 18.8% of Americans did not have health insurance. A lack of access to health care is a more serious problem among people who are under the poverty line. For example, in 2009, approximately 10% of children under the age of 18 did not have health insurance. The percentage of uninsured children who are below the poverty level, however, is 31.7%. Data are from the Current Population Survey's Annual Social and Economic Supplement (CPS ASEC), Health Insurance Table HIA4 and HIA8.
(Wilkinson 1996), class, and race (Kawachi et al. 2005; LaVeist 2005). The role that system characteristics play in influencing equal access to health care has not received a lot of attention.

Although in theory we would expect public organizations to be concerned about equity, the ability of the public sector to achieve its goal of equity also depends on the structural characteristics of the health care system. We argue that there is a relationship between the publicness of the health care system and equal access to health care (i.e. equity). Specifically, because public organizations include equity as a goal, the level of publicness of the health care system will affect equal access to health care. Starr (1993) points out that, “the politics of a health system that is 90 percent public and 10 percent private is very different from a health system that is 90 percent private and 10 percent public” (23). In other words, the publicness of the health care system is important for providing better coverage to those without economic or political power, the poor.

This is because in a majoritarian system, if the majority of people’s health care is provided by the private sector, the market system does not lead to political support from the middle and upper classes for the redistribution of resources to the poor. Conversely, if more people, such as those in the middle class, are covered by public sector programs, “they are more likely to be more generous and not begrudge the poor for getting equal access to health care” (Patel and Rushefsky 2008, 23). Thus, how well the system addresses the issue of equal access to health care largely depends on how much it incorporates the poor and the middle class through public venues.

Health care provisions in the U.S operate through a regulated market system; both private and public sector organizations take part in the provision of health care insurance coverage and various health care services. While the market system and private sector focus on improving
profits, government organizations will be pressed to be more responsive and accountable to the public by having health care equity as a primary policy goal. The complexity of healthcare arrangements means that there may be different or competing goals for healthcare provisions, such as market efficiency versus equal access to health care. Strategies for improving health care may also be different between the private and public sector.

Moreover, states have great political discretion in deciding how to best allocate their resources to meet the needs of their citizens, defining what services to provide and to whom influence organizational outcomes such as equity. As a result, states’ health care service delivery systems differ substantially and vary in their institutional arrangements that correspond with Bozeman’s dimensional framework.

Public Ownership

Recall that public ownership is defined by some public-oriented purposes and goals. In service delivery systems intended to serve a common public purpose, we should see public (i.e. government) involvement in the infrastructure of the service delivery system. States can choose how much of the health care service delivery system they want to ‘own’. For example, in some states such as Delaware, New Hampshire, Rhode Island, and Vermont, there are no state and local government owned hospitals. In other states such as California and Georgia, a large proportion of community hospitals are owned and managed by state and local governments. This means that each state varies in their amount of ownership of the service delivery infrastructure. We would expect that states that own more of the health care infrastructure would have more equitable health care access. In other words, public ownership is positively related to the equity of health care access.
Hypothesis 1: As public ownership of the health care system increases, equity in health care access will also increase.

Public Finance

The publicness of a state’s health care delivery service system not only includes access to hospitals and care, but also social protections through the insurance system (LaVeist 2005; Oliver and Paul-Shaheen 1997; Davidson 1993; Thorpe 1993). The U.S. health care system is a two-tier system, in which neither the public or the private sector monopolizes the health insurance market and the service delivery system. At the national level, employers sponsor 49% of health insurance coverage and 28% is provided through government programs such as Medicare and Medicaid. But these percentages vary by state. For instance, in some states such as Hawaii, all employers must offer health insurance benefits to employees who work at least 20 hours a week. Just as with ownership, states can decide how and by whom health care insurance is provided to the public.

Thus, one aspect of public finance in health care is how many health care services are provided through public venues and distributed to economically or socially disadvantaged groups. In other words, where people acquire their health insurance, either through public programs such as Medicare, Medicaid, health care programs for veterans, children’s health insurance programs, etc. or through private programs such as employer coverage, is an indication of the level of publicness in the state health care delivery system.

Another aspect of public finance, according to Bozeman’s framework, is that the source of financial resources differentiates public and private organizations. In the context of health care
in the U.S., the allocation of government resources to health care can be conceptualized as an indicator of state policy commitment. Therefore, the resources that a particular government sector has can be a proxy for the amount of services it seeks to offer clients.

States, of course, vary in their funding capacities and priorities. Some bureaucracies have fewer amounts of resources with which to handle difficult problems. For instance, Lipsky (1980) contends that bureaucrats often complain that they lack the resources to perform their jobs well. Consequently, when operating under resource constraints, bureaucrats must make tradeoffs that will hurt some constituent groups. Indeed, states determine who is eligible for public health insurance by setting state income eligibility limits. Limits vary from 18% (Arkansas 2006) of the federal poverty level to 275% (Minnesota) of the federal poverty level. States that set low-income eligibility limits offer less public health care to citizens than states with a higher income eligibility limit because less people are eligible for public health insurance coverage. In other words, financial resources may constrain the ability of public organizations to deliver services and information to all citizens equally.

Both public involvement in providing and legislating about health care insurance and direct spending on health care programs are important aspects of public finance that may affect social equity in health care. Hence, we expect to see more equal access to health care in states where more financial resources are provided through public venues.

_Hypothesis 2:_ In a state health care system with greater public financing, there will be greater equity in health care access than in a state health care system with less public financing.

**Determinants of Equity in Health Care Access: An Empirical Assessment**
To test the aforementioned hypotheses about the relationship between the publicness of state health care systems and equal access to health care, we employ a pooled cross sectional design. Because of different institutional arrangements across states, a state level analysis is suitable for exploring the relationship between the publicness of state health care service delivery systems and social equity. Our dataset includes state-level information about access to health care, demographics and characteristics of state health care systems for each of the 50 states from 1990 to 2006.

Data and Measures

Health Care Equity

Equity, when applied to health care, is equal access to health care resources and fairness in terms of health care delivery. We argue that equity, at the minimum, is about equal access to health care. We operationalize the concept of equal access to health care by gauging insurance coverage, i.e. if the existing health care system in a state successfully provides care to all citizens. Empirically, we measure health care equity by the percentage of the population who are without health insurance. A state with a large uninsured population reflects a system in which more citizens are excluded from health care access. Thus, such a system remains separated and unequal. We use the state-level annual uninsured rate for non-elderly population as our

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6 Washington D.C. is not included. There are missing data for some of our explanatory variables. For example, we include education as one of the socioeconomic controls. Data are not available for all fifty states in a yearly manner. There are year gaps in 1995, 1997, and 2001. We also use state level public payroll data to measure human resource capacity in state health care systems. For some states, there are missing data points due to incomplete government archives. We do not detect a particular selection pattern for missing data. Hence, we implement a mean-interpolation procedure to replace the missing values. Specifically, if there is a missing value for variable A in time t in state i, we use the mean between $A_{t-1,i}$ and $A_{t+1,i}$ to fill in the missing value. We do not interpolate any missing values based on cross-sectional information.
dependent variable. Data for the state-level uninsured rate are drawn from the U.S. Census Bureau Health Insurance data archive. More specifically, governmental estimates on states’ annual uninsured rates are calculated based on three national surveys: the Current Population Survey’s Annual Social and Economic Supplement, the American Community Survey, and the Survey of Income and Program participation. Data are archived in the Census Bureau historical tables, *Health Insurance Coverage Status and Type of Coverage By State, Persons Under 65*.

Figure 1 presents the average percentage of uninsured population in each state, calculated based on data from 1990 to 2006. As Figure 1 shows, there are variations across the fifty states in the average percentages of uninsured population. Based on the 17-year average, Texas, New Mexico, Louisiana, Florida, and Arizona rank highest among the fifty states in the percentage of population who do not have insurance. Conversely, Wisconsin, Minnesota, and Hawaii have the smallest percentages of uninsured population. 7

[Figure 1 About Here]

*Publicness of State Health Care Systems.*

Based on our theoretical arguments, the publicness of a state’s health care system matters for promoting social equity in health care because in the public sector social equity is an essential policy goal. When financial and human resources are managed and allocated through the public sector, organizational goal promoting equity are adopted and emphasized. Therefore, to measure how “public” state health care systems are, we define our publicness indicators on two dimensions: ownership and financial resources.

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7 Figure 1 mainly shows average uninsured rates across states. Based on our sample, the range of our dependent variable is from 6.7 (Hawaii 1992) to 28.3 (New Mexico 1995), with a standard deviation of 4.46.
First, we measure *public ownership* by examining the structural characteristics of the community hospital system in each state. At the state-level, primary care is provided through three main types of medical facilities: state and local government-owned hospitals, non-government/not-for-profit hospitals, and investor-owned (for profit) hospitals. We measure public ownership as the percent of community hospitals that are owned by the government.  

Second, we use two empirical indicators to measure *public financing in health care*: (1) public financing in health insurance and services and (2) government spending in health care and hospitals. In the U.S., Medicaid is the major public health program for non-elderly individuals and families with low-income and resources. This means-test program covers health insurance and medical services to eligible low-income individuals and their families. We calculate the publicness of health insurance and services through Medicaid (to non-elderly people) as the percentage of state-level total spending on personal health care. Substantively, a higher percentage represents more publicness in financial resources. Data for this empirical measure are drawn from the U.S. department of Health and Human Services, Centers for Medicaid and Medicare Services Expenditure Reports.

In addition to the span of state Medicaid programs, we also measure the total public spending on health care and hospitals as the second indicator for publicness of financial resources. We combine three forms of government sending in health care and hospitals (state, local, and federal aid) and calculate this spending measure as a percentage of the state GDP. Data about government healthcare spending are drawn from the U.S. Census Bureau, *Annual Survey*

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8 We use the categorization of healthcare organizations based on the American Hospital Association’s standards (AHA). Community hospitals are primary health care facilities in state health care systems. They refer to all non-federal, short-term, general, and special hospitals that provide care services to the public. Because the American health care system is primarily a pay-for-service system, we calculate our ownership measure by focusing on the major health care facilities.
We present descriptive statistics for our measures of dimensional publicness in Table 1. We see a wide range of variation on the two dimensions of ownership and finance. On average, 24.09% of the community hospitals are government-owned hospitals. This means that overall, state health care systems are owned by private and non-profit organizations. In some states such as Maryland and Vermont, more than 50% of the community hospitals are government-owned hospitals. States also vary in terms of their public financial sources. Comparing the two financial resource indicators, we see less variation in the total spending measure than in the Medicaid spending measure.

We also perform a dimensional analysis to evaluate if these three empirical measures reflect different dimensions of publicness. We examine the Pearson correlations between the three measures. The correlation between public ownership and total government spending is 0.527 (p=0.000) and the correlation between public ownership and the state Medicare/Medicaid spending is -0.193 (p=0.000). The two public financing measures are positively correlated to each other. The correlation between total public health spending and the scope of Medicaid is relatively small (0.213, p=0.000).

In addition, we use principal-component factor analysis to evaluate if the three empirical measures really represent different dimensions suggested by the theoretical framework of dimensional publicness. The factor analysis renders two factors. In the second factor, public ownership is loaded negatively, while the two public financing measures are loaded positively.
Our empirical data reflects the theoretical argument that ownership publicness and financial publicness are two related but different concepts.

**Controls**

To isolate the effect of dimensional publicness on health care equity, we include a set of variables that may affect a state’s decision to provide more public health care programs and thus people’s access to health care.

First, we control for two institutional characteristics of state health care systems: generosity of state healthcare policy and state-level bureaucratic resources. We use state Medicaid eligibility rules as a proxy measure for the generosity of a state’s health insurance provisions. The specific eligibility measure is Medicaid income eligibility limits for working adults, calculated as a percent of the federal poverty level (FPL). Eligibility rules define who is qualified to be covered by public healthcare and directly affect the size of Medicaid enrollment. State Medicaid income eligibility limits also directly affect the scope of public health insurance provisions. Data for this variable are drawn from the Kaiser Family Foundation’s policy report on state Medicaid eligibility rules (Heberlein et al. 2011).

We also control for available bureaucratic resources in the state health care system. We use the size of the public healthcare workforce to measure street-level bureaucratic resources. This variable is calculated by assessing the size of the public healthcare workforce at two governmental levels: the state level and the local level. We draw data from the U.S. Census Bureaus Annual Survey on Government Employment and Payroll. This variable is computed as a health professionals-to-clientele ratio based on the number of public health employees per
10,000 residential population.\(^9\)

Second, we control for economic conditions that may be associated with uninsured rates. Specifically, we control for state poverty and unemployment rates. Poverty is measured by the percent of the state’s population who are under the 100% federal poverty line. Unemployment is measured by the state’s annual unemployment rate. These two variables are included as proxies for individuals’ economic conditions. In general, if there were no public insurance available, low-income people would have less access to health care and thus would be more likely to belong to the uninsured group. Unemployment status also matters as an important economic condition because most private provisions are employment-based programs.

Third, we also control for average education attainment, access to physicians, and state-level demographics. We construct the measure for Education Attainment as a percentage of the state’s population who have at least a high school diploma. Access to Physicians is measured by the number of active physicians per 100,000 residential population. We include three demographic variables. Aged Population is measured by the percentage of the state’s population who are older than 65. The other two demographic variables are the percentage of Black and Latino populations.\(^{10}\)

\(^9\) The survey provides data on full-time and part-time employment, part-time hours worked, full-time equivalent employment, and payroll statistics by governmental function. Data in 1990 and 1991 are coded from the U.S. Census Bureau Annual Statistical Abstract. We use the state summary tables in Section 8: “State and Local Government Finances and Employment,” and “State and Local Government Full-Time Equivalent Employment by Selected Function and State.” Community and social workers, part-time employees, and professionals in the private sector are not included.

\(^{10}\) Data for Poverty, Education, and Aged Population are drawn from the U.S. Census Bureau American Community Survey (ACS). Data for unemployment are drawn from U.S. Bureau of Labor Statistics, “Geographic Profile of Employment and Unemployment.” We access the data for aged population through the Centers for Diseases Control and Prevention database WONDER. We access data for education attainment in the U.S. Census Bureau Annual Statistical Abstracts, the sections for Education. Data for active physicians are drawn from the Census Bureau Annual Statistical Abstracts, Section for Health and Nutrition: Healthcare Resources.
LaVeist (2005, 136) substantiates that the socio-environmental or context theories attribute inequality in health care to differences in the social, economic, and environmental context in which people live. For instance, in states with a large population of poor and less educated people, and in states with poor economic conditions, state governments may face resource constraints; there is less money available to spend on health inequality issues. State demographics are also likely to affect the overall uninsured rates because the uninsured rates among low-income minorities are disproportionately higher than those among low-income whites (Smedley et al. 2003).

We also control for influences from political values. We use the Berry et al. (1998) measure for Citizen Liberalism a proxy for external political values that may affect governmental involvement in health care provisions. The decision to provide more or less healthcare through public systems is influenced by different political values. Research has shown that liberals are more likely to support the public provision of healthcare than conservatives (Wright et al. 1987; Oliver and Paul-Shaheen 1997). Liberals, moreover, are more likely to favor and use government solutions to problems like lack of access to healthcare. Conservatives, in turn, might favor a market approach. Political ideology can also generate profound social implications in inequality. In the United States, “ideology differences in economic philosophy and distributional priorities are especially striking in the realm of taxation policy” (Bartels 2009, 54). Liberal states may raise higher tax revenues and spend more on healthcare issues than conservative states. Hence, it is reasonable to expect that citizen liberalism is positively related to equity in healthcare access.\(^\text{11}\)

\(^{11}\) We use the “Revised 1960-2008 Citizen Ideology Series” from Richard Fording’s website, http://www.uky.edu/rford/stateideology.html.
Methodology

We estimate an empirical model for equal access to health care, in which we hypothesize that the percentage of uninsured people is driven by the publicness of the state health care system, available bureaucratic and professional resources, and socioeconomic characteristics of the state. The general model is defined by the following equation, in which i indexes state and t indexes year.

\[
\% \text{ Uninsured Population}_{it} = \beta_0 + \beta_1 \% \text{ Public Hospitals}_{it} + \beta_2 \% \text{ Public Insurance}_{i,t-1} \\
+ \beta_3 \% \text{ Public Health Spending}_{i,t-1} + \beta_4 \% \text{ Health Employees}_{i,t-1} \\
+ \beta_5 \text{ Medicaid Eligibility}_{it} + \beta_6 \text{ Citizen Liberalism}_{it} \\
+ \beta_7 \text{ Access to Physicians}_{it} + \beta_8 \text{ Poverty}_{i,t} + \beta_9 \text{ Unemployment}_{it} \\
+ \beta_{10} \text{ Education}_{it} + \beta_{11} \text{ Aged Population}_{it} + \beta_{12} \text{ Black Population}_{it} \\
+ \beta_{13} \text{ Latino Population}_{it} + e_{it}
\]

Data used to estimate the empirical model combine observations in multiple units at multiple points in time–so-called panel or cross-sectional-time-series (CSTS) data. It is essential to evaluate data variations in the two-dimensional data structure, i.e. within effects (the effects of through-time changes in unit-level covariates) and between effects (differences in unit means) (Allison 2009; Baltagi 2008). The dependent variable varies more across states than across time. Based on the sample, the state-means range from 9.57 to 25.89, with a standard deviation of 4.03. The across-time means, however, range from 14.21 to 16.90 with a standard deviation of 0.83.

We then examine if the dependent variable is panel stationary. When testing for panel unit-root, we find the dependent variable, % uninsured population, to be panel stationary.\(^\text{12}\)

\(^{12}\) We perform the Fisher Test for panel unit roots (Maddala and Wu 1999). Fisher’s test assumes that all series are non-stationary under the null hypothesis against the alternative that at least one series in the panel is stationary. Hence, insignificant Chi-square statistics indicate the presence of unit-root. We also performed three variants of the Fisher Test: with lag=2, with a Phillips-Perron specification, and with an Augmented Dickey-Fuller specification.
Across-state heterogeneity, however, is detected due to extreme values in some of the explanatory variables. First, as for the public ownership variable, six states take a value of 0, because all of their community hospitals are owned by non-governmental entities. These six states are: Delaware, Maryland, New Hampshire, North Dakota, Rhode Island, and Vermont. These states also have relatively small Latino populations. Second, Louisiana is detected to be an outlier state case due to relatively high poverty. Third, Alaska is an outlier case because of relatively high unemployment. Given that the dependent variable is panel-stationary and heterogeneity is detected across states, we estimate the empirical model with panel-corrected standard errors (Beck and Katz 1995) and dummy variables for each of the aforementioned outlier states.

The variables for public financial resources and the state healthcare workforce are constructed based on data on government finance and payroll. Because government decisions in budgeting and hiring are made based on fiscal cycles, we take a one-year lag for these three variables. Last, we pool data from various government archives for the empirical analysis. The data-generating process is not random. To control for variables (along the time dimension) that have not been measured, we include fixed-effects dummy variables for each year. The idea is

Test results consistently show the dependent variable is panel stationary. The Chi-square statistics based on the Fisher’s test using an augmented Dickey-Fuller test without lags is $\chi^2(100) = 253.636$, with a p-value of 0.000. Using the same test, but adding 1-year lags, we obtain $\chi^2(100) = 152.922$ (p=0.000). Using the Phillips-Perron Test with 1-year lags, we obtain $\chi^2(100) = 255.745$ (p=0.000).

13 After estimating an OLS base-model, we use the Breusch-Pagan test for non-constant residual variance. The test produces significant $\chi^2$ statistics, $10.56$ (p=0.0012). We also perform the Modified Wald test for group-wise heteroskedasticity and obtain significant test statistics-- $\chi^2(50)=1123.82$ (p=0.000). Both tests produce consistent results and show that cross-state heterogeneity is present.

14 We also controlled for Hawaii, which is the first state that enacted mandated employer-based health insurance. Massachusetts initiated its health insurance reform act and introduced mandated health insurance as well. Because the Massachusetts healthcare insurance reform was introduced in 2006, we did not include a state dummy variable for Massachusetts. The uninsured rates in Massachusetts dropped from around 10% to 5% after the introduction of its health insurance reform.
straightforward: use each year as its own control (Allison 2009). 

**Results for Pooled Panel Data Analysis**

Table 2 reports the results for our pooled time series analysis. As Table 2 shows, the two economic variables, poverty and unemployment, are both strong predictors of the state-level uninsured rates. The coefficients of these two variables are both relatively large. As for unemployment, a one-unit increase in the unemployment rate (i.e. an increase by 1%) could lead an average increase in the uninsured rate by 0.424%. The impact of poverty on the uninsured rate is comparable. States with high poverty rates have more people who are not covered by healthcare insurance than states with low poverty rates. A one-unit increase in the poverty rate may increase the percentage of uninsured population by 0.462. This finding makes empirical sense because in a pay-for-service healthcare system, people live without health insurance involuntarily either because they are not covered by their employers (due to unemployment) or because they cannot afford health insurance (due to poverty). This finding also suggests that economic deprivation may reduce social equity in access to health care and add disproportionate burdens on the poor and the unemployed.

State demographics also exhibit significant effects on the uninsured population. Both the sizes of Black population and Latino population are positively associated with the uninsured rates. The Latino population, however, has greater impact on the uninsured rates. This

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15 We controlled for fixed-effects by year also because data variation is mainly driven by cross-state differences. We estimate a random-effects GLS regression as the base-model to compare data variation across years and across states. This random-effects GLS regression produces a within $R^2$ of 0.114 and a between $R^2$ of 0.752.

16 To evaluate the stability of the parameters in our empirical model, we use the Clarify program in STATA to run simulation analysis. In Table 2, the column for “simulated beta” presents the mean values for all beta coefficients based on 1,000 simulations. We use this as a robustness check for our empirical model. Parameter estimations are not robust if we see relatively large differences between the simulated values and the coefficients estimated based on the panel data analysis. Conversely, parameter estimations are reliable if the simulation analysis produces consistent results.
finding is consistent with the state rankings illustrated in Figure 1. The top five states with very high uninsured rates (TX, NM, LA, FL, and AR) all have relatively large Latino population.

[Table 2 About Here]

Turning to our theoretical focus on the link between the publicness of state health care systems and equity in access to health care, Table 2 shows that all three indicators of dimensional publicness have significant statistical associations with the percentage of uninsured population. We posit in Hypothesis 1 that as the level of ownership publicness increases, there will be more equal access to health care, i.e. lower uninsured rates. Our panel data analysis produces a positive and statistically significant slope of the variable for public ownership. To gauge if, substantively, ownership publicness increases social inequality in access to health care, we hold all other explanatory variables constant and calculate the predicted uninsured rates based on the full range of the variable for ownership publicness (King et al. 2001; Tomz, Wittenburg and King 2003).

Figure 2 illustrates how the state-level uninsured rates would change along the range of ownership publicness. As Figure 2 shows, the predicted uninsured rates when ownership publicness is low and when ownership publicness is high are not statistically distinguishable at the 95% significance level. Based on our data, the ownership publicness variable ranges from 0 to 70.83. Holding all other variables constant and setting ownership publicness equal to 0, the predicted uninsured rate has a mean value of 14.7 and the 95% confidence intervals are 14.1-15.3. Using the same calculation and setting the ownership publicness to be the maximum, the predicted uninsured rate has a mean value of 16.4 and the 95% confidence intervals are 15.3-
17.3. Because the two confidence intervals overlap, the two mean predicted values (14.7 and 16.4) are not statistically distinguishable from each other.

[Figure 2 About here]

Figure 2 suggests that although our empirical model reports a significant coefficient of the ownership variable, ownership publicness does not have a substantive impact on reducing uninsured rates. In other words, states with a high level of ownership publicness may not provide more equal access to health insurance than states with a low level of ownership publicness.

Hypothesis 2 posits that as more financial resources for health care are provided through public venues, uninsured rates will decrease. Empirically, we find that both the span of public insurance and the total public health spending are negatively associated with uninsured rates, meaning that public health insurance provisions generate more equal access to health care.

Table 2 shows that the two indicators for public financial resources have substantive effects on reducing uninsured rates. The publicness of state health insurance provisions (through Medicaid) has a negative marginal effect on uninsured rates. The slope is -0.106, meaning that a one percent increase in the proportion of public spending in health insurance will decrease the uninsured rate by 0.106%. Total public spending in healthcare and hospitals also has a significant and negative effect on the uninsured rates. The slope is -1.047, meaning that if total state public health spending (as a percentage of state GDP) increases by 1%, the uninsured rate would decrease by 1.047%.

The substantive effects of these two spending measures are relatively comparable, because they are percentage measures based on different denominators. The mean total
healthcare spending (combining government, employer, and out-of-pocket contributions, i.e., the denominator for the public health insurance measure) is approximately 11% of the mean state GDP (the denominator of the total public healthcare spending measure). This suggests that similar amounts of financial resources are needed for decreasing the uninsured rate through different spending venues. Total public healthcare spending, nevertheless, has a slightly larger impact on the uninsured rates than public insurance provisions through Medicaid.

Figures 3 and 4 present the predicted uninsured rates based on our in-sample ranges of the two financial publicness measures. Figure 3 shows that public financing of Medicaid has a substantive impact on people’s access to health care. In states with a high level of public insurance provision, uninsured rates are relatively low. In states with a very low level of public insurance provision, uninsured rates are relatively high. Similarly, Figure 4 illustrates that in states with a high level of public spending in health and hospitals, uninsured rates are relatively low. Figure 3 and Figure 4 provide consistent empirical support for Hypothesis 2; the financial publicness of a state’s health care system reduces the percentage of uninsured population in the state. In other words, state health care systems with sufficient public financial resources provide more healthcare insurance and medical services to the poor and the unemployed than systems with less public financial resources.

[Figure 3 About Here]

[Figure 4 About Here]

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17 There is a key difference between Figure 3 and Figure 2. In Figure 2, the predicted uninsured rates have overlapping confidence intervals almost across all the in-sample values of ownership publicness. In Figure 3, the predicted uninsured rates do not have overlapping confidence intervals across all the in-sample values of public insurance.
In addition to the three publicness measures, we also find that state Medicaid eligibility rules have a moderate impact on reducing the uninsured rates. States with generous eligibility rules (i.e. high income caps for defining eligible citizens) have slightly lower uninsured rates than states with tight eligibility rules (i.e. low income caps for defining eligible citizens).

To summarize, we find that different dimensions of organizational (system) publicness exhibit different impacts on improving equal access to health care to the public. Our empirical analysis suggests that financial publicness may have a more substantive impact on social equity in health care access than ownership publicness. Who owns facilities in the service delivery system may not matter much for providing health care coverage to the poor and the unemployed. Government involvement in funding health care, however, is directly related to whether economically disadvantaged citizens can get access to health care.

It is also possible that ownership publicness is linked to health care quality more than health care access (i.e., service quantity). Arguably, government-owned hospitals and medical facilities have different organizational goals from investor-owned hospitals. These different goals, nevertheless, may not impact how many services they provide to citizens, but may affect the quality of medical care. Goldstein and Naor (2005) compare the ownership of more than 150 hospitals and find that government-owned, non-profit and for-profit hospitals do not differ from each other based on the quantity of services provided to citizens (measured by process management such as increasing patient loads and service capacity, etc.). However, ownership publicness does affect the quality management practice.

**Conclusion**
Exploring state level health care provisions in the United States, we systematically show a link between dimensional publicness and organizational (system) outcomes that generate social equity for the public. We explain how the U.S. health care system is designed and organized has profound implications for social equity. We find that in a regulated market system, where both public and private sectors provide health care services to citizens, increasing the span of public insurance provisions could benefit the eligible poor, who would be excluded by a pure market system due to lack of personal resources. Increasing public ownership of the health care system generates more equitable outcomes, but only moderately. Health care equity, we find, is better preserved when state health care systems are controlled more with public-oriented values as expressed through finance publicness.

Using a timely empirical case of health care provisions, we extend the theoretical focus on comparing how public and private organizations differ in their organizational characteristics by linking these different organizational arrangements to the public outcomes of social equity. We demonstrate that the theoretical framework of dimensional publicness can be used to inform our understanding of the social outcomes organizations generate. We show that one key distinction between more public organizations and more private organizations (or systems) lies in how much social equity they produce for the public.

This study takes a first step at examining the relationship between publicness and social equity by using the overall insured population as an empirical measure for equal access to health care. Although exclusion of poor people in state health care systems is an important reflection of health care inequality, there are other forms of conceptualizing social equity such as an equal quality of care and services for all citizens. A natural extension of this study is to probe a variety
of measures for health care equity and to further examine how institutional arrangements in state health care systems affect different equity outcomes.

This research addresses the dimensional publicness literature. However, we test publicness with the public ownership and public finance dimensions and do not test the public control dimension. Future research should explore the relationship between social equity and the publicness of public delivery systems by including all three dimensions of publicness.

Future work also needs to consider the collaborative relationships between sectors. How the public, private and nonprofits sectors reconcile their different organizational goals and how such partnerships affect outcomes has implications for social equity. In many states, health care insurance is financed through private-public partnerships. The delivery of health care services, moreover, is also managed through collaborative networks. The networked environment and different institutional designs of public-private partnerships may also constitute important structural factors that can be linked to social equity outcomes. How may public health care administrators and public managers rely on their networks to promote equity in the system? How may the non-sector sector affect social equity outcomes in health care? Future research needs to address these questions by expanding the theoretical scope for indentifying important institutional and organizational factors that may affect equitable health care outcomes.

Social equity is the basis of a just and democratic society (Frederickson 2005). Our study has practical implications for policymakers, health care proponents, and citizens concerned with social equity. We contend that the publicness of service delivery systems has an impact on social equity. We show that public provisions exhibit a significant effect on improving equal access to health care. How the public health care system is organized through the public sector is important to achieving and sustaining social equity in health care. Systemic changes in the
provision of health care constitute an essential step for solving the persistent problem of health care inequality. This study brings to light the consequences to a democratic society of the public provision of services for equity amongst all citizens.

References


Figure 1. Average Percentage of the Population without Health Insurance in the Fifty States, 1990-2006.

### Table 1. Publicness of State Health Care Systems: Descriptive Statistics, 1990-2006.

<table>
<thead>
<tr>
<th>Measures</th>
<th>N</th>
<th>Mean</th>
<th>Std.</th>
<th>Min</th>
<th>Max</th>
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<tr>
<td><strong>Ownership</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Hospital</td>
<td>850</td>
<td>24.209</td>
<td>18.640</td>
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<td>70.833</td>
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<td><strong>Source of Finance</strong></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Public Health Insurance</td>
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<td>15.086</td>
<td>3.879</td>
<td>5.900</td>
<td>32.750</td>
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<td>Public Health Spending</td>
<td>850</td>
<td>1.290</td>
<td>0.540</td>
<td>0.370</td>
<td>3.550</td>
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</tbody>
</table>

Notes:
1. *Public Hospital* is measured as the percentage of community hospitals that are owned by state and local government.
2. *Public Health Insurance* is measured based on the state Medicaid spending as the percentage of total state spending on personal health care.
3. *Public Health Spending* is measured based on government spending on health care and hospitals as a percentage of state GDP.
Table 2. Determinants of the % Uninsured Population in the Fifty States, 1990-2006.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>PCSEs</th>
<th>p-Value</th>
<th>Simulated-Beta</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Public Hospital</td>
<td>0.024</td>
<td>0.007</td>
<td>0.000</td>
<td>0.024</td>
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<tr>
<td><strong>Source of Finance</strong></td>
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<tr>
<td>Public Health Insurance_{t-1}</td>
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<td>0.038</td>
<td>0.006</td>
<td>-0.104</td>
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<tr>
<td>Public Health Spending_{t-1}</td>
<td>-1.047</td>
<td>0.379</td>
<td>0.006</td>
<td>-1.104</td>
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<td><strong>State Healthcare Systems</strong></td>
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<tr>
<td>Public Health Employees_{t-1}</td>
<td>0.002</td>
<td>0.008</td>
<td>0.811</td>
<td>0.002</td>
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<tr>
<td>Access to Physicians</td>
<td>-0.013</td>
<td>0.003</td>
<td>0.000</td>
<td>-0.013</td>
</tr>
<tr>
<td>Medicaid Eligibility</td>
<td>-0.006</td>
<td>0.001</td>
<td>0.000</td>
<td>-0.006</td>
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<tr>
<td>Citizen Liberalism</td>
<td>0.004</td>
<td>0.003</td>
<td>0.217</td>
<td>0.004</td>
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<td><strong>Economic Conditions</strong></td>
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<tr>
<td>Unemployment</td>
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<td>Poverty</td>
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<td><strong>Demographics</strong></td>
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<tr>
<td>Education</td>
<td>-0.048</td>
<td>0.035</td>
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<td>-0.047</td>
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<tr>
<td>Percent Aged Population</td>
<td>0.205</td>
<td>0.044</td>
<td>0.000</td>
<td>0.204</td>
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<tr>
<td>Percent Black Population</td>
<td>0.097</td>
<td>0.012</td>
<td>0.000</td>
<td>0.097</td>
</tr>
<tr>
<td>Percent Latino Population</td>
<td>0.261</td>
<td>0.013</td>
<td>0.000</td>
<td>0.261</td>
</tr>
<tr>
<td><strong>Intercept</strong></td>
<td>8.89</td>
<td>3.460</td>
<td>0.010</td>
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<tr>
<td><strong>N</strong></td>
<td>790</td>
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<tr>
<td><strong>R^2</strong></td>
<td>0.748</td>
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<td></td>
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</tr>
</tbody>
</table>

Notes:
1. The dependent variable is the percent of the population who do not have health insurance.
2. * p<.10, ** p<.05, two-tailed test.
3. Fixed-effects dummies for year and dummies for outlier cases are not reported. The dummy variables for DE and NH are not statistically significant. The dummy variables for AK, HI, LA, MA, ND, RI, and VT are significant.
4. The simulated beta coefficients are calculated via the Clarify program in STATA.
Figure 2. The Impact of Public Ownership on Access to Health Care, 1990-2006

1. The dependent variable is the percent population without health insurance.
2. Public ownership is measured as the percentage of community hospitals owned by the government.
3. All other variables are set at their means (for continuous variables) and medians (for categorical variables).
Figure 3. The Impact of Public Health Insurance on Equal Access to Health Care, 1990-2006

Notes:
1. The dependent variable is the percent population without health insurance.
2. Public health insurance is measured based on state Medicare and Medicaid spending as the percentage of total state spending on personal healthcare.
3. All other variables are set at their means (for continuous variables) and medians (for categorical variables).
Figure 4. The Impact of Public Health Care Spending on Equal Access in Health Care, 1990-2006

Notes:
1. The dependent variable is the percentage of the population who do not have health insurance.
2. Public spending is measured as the percentage of State GDP.
3. All other variables are set at their means (for continuous variables) and medians (for categorical variables).