

Resource Allocation in Public Health Practice

by

Nancy M. Baum

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Doctoral Committee:
Professor Peter D. Jacobson, Chair
Professor John R. Chamberlin
Professor Susan D. Goold
Assistant Professor Daniel Eisenberg

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For my husband, David,
and for our children, Alex and Aaron

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TABLE OF CONTENTS

Dedication.....	ii
Acknowledgements.....	iii
List of Figures.....	v
List of Tables.....	vi
Chapter 1 Introduction.....	1
Chapter 2 Resource Allocation in Public Health Practice: A National Survey of Local Public Health Officials.....	5
Chapter 3 The Role of Discretion in the Resource Allocation Decisions of Local Public Health Officials.....	50
Chapter 4 Ethical Issues in Pandemic Preparedness and Response: Focus Groups for Public Engagement.....	89
Chapter 5 Conclusion.....	140

LIST OF FIGURES

FIGURE

2.1	Types of Allocation Decisions.....	36
2.2	Processes Used to Make Resource Allocation Decisions.....	37
2.3	Influential Factors in Allocation Decisions.....	38

LIST OF TABLES

TABLE

2.1	Demographic Characteristics of Local Health Officials.....	32
2.2	Local Health Department Characteristics.....	33
2.3	Local Health Department Revenues and Expenditures.....	34
2.4	Influential Factors in Allocation Decisions.....	35
3.1	Discretion Variables by Size of the Population and Governance Structure.....	81
3.2	Variables Included in Regression Models.....	82
3.3	OLS Estimates of Two Discretion Variables: Log (Proportion of Funds) and Log (Proportion of Personnel Time) Officials can Reallocate.....	83
3.4	Ordered Logistic Regression Estimates (Odds Ratios) of LHOs' Overall Control in Allocation Decision Making.....	84
3.5	Proportion of Needs Met for Selected Public Health Services and Activities.....	85
3.6	Is Discretion in Funds Allocation Associated with Meeting Community Public Health Needs?.....	86
3.7	Is Discretion in Personnel Time Associated with Meeting Community Public Health Needs?.....	87
3.8	Bivariate OLS Estimates of the Proportion of Needs Met.....	88
4.1	Participant Characteristics.....	132

CHAPTER 1

Introduction

Public health systems research is a growing area of inquiry about effectiveness in public health practice in the U.S. The public health system is poorly understood, in part because there is enormous heterogeneity among local health departments in financing, organization and the provision of services. The emphasis on such variation, however, may have inadvertently limited our progress in creating a fundamental knowledge base about our public health system. This dissertation research acknowledges and affirms the variation in the public health system. At the same time it endeavors to increase understanding about how local public health officials set priorities and whether there is a valuable role for the public in allocation decision making.

The three papers that make up this dissertation are broadly situated in the ethical and political theories of distributive justice, stewardship and democratic deliberation. The practical distribution of the benefits and burdens associated with public health actions is guided by competing conceptions of equality, maximization and helping the least advantaged. Issues of equity and fairness in apportioning public health resources cannot be resolved through science and laws alone, but require normative judgments. As stewards of public health resources, local health officials are trusted to make these judgments and to be efficient and fair in their decision making. They must decide which programs to run and therefore which population groups to serve, but they must do so within the constraints of inadequate infrastructure and rigid revenue streams. They must

also manage periodic scarcity of important resources and address public concerns for fairness.

Deliberative procedures are hailed as egalitarian methods for involving the public in decision making activities about issues that directly affect them. They are expected to increase transparency in policy processes and provide policy makers with information about the issues that concern citizens. The public health community is just beginning to assess the value of these procedures in areas like pandemic preparedness and response.

These theories are applied in two separate but related studies that make up the three papers included in this dissertation. The first is a national survey of local health officials. We assess the types of allocation decisions officials make and the factors that influence those decisions, and we explore the role of bureaucratic discretion in apportioning resources. The second is a series of focus group sessions with members of the public. We analyze their deliberations about value-laden policy decisions related to pandemic preparedness and response.

My first paper is entitled, “Resource Allocation in Public Health Practice: A National Survey of Local Public Health Officials.” Little prior research has characterized priority-setting activities in public health. We designed and executed a survey to gain an empirical understanding of the types of decisions local health officials make and their insights into what influences those decisions. We also employed new survey data from the National Association of County and City Health Officials which give context to our survey data so that we can compare allocation decisions by governance structure and by the size of the population served by the local health department. The particular contribution of this study is a clearer understanding of the ways that local health officials

fulfill their obligations as stewards of public health resources. Again, variation is a clear theme in allocation (as it is in so many issues) in local public health. At the same time there is also consistency among most officials in the way they value the effectiveness of the activities and services they offer and take seriously their department's role as sole providers of certain services in their communities. The study shows that allocation decisions are most often made without the benefit of data from needs assessments and that staffing shortages are the norm for nearly 40% of local health departments. Officials report little shifting of resources among population groups, and only minimal direct public input in the allocation process.

In my second paper, titled "The Role of Discretion in the Resource Allocation Decisions of Local Public Health Officials," I focus on the flexibility and control that officials report in allocating revenues and personnel effort. This particular focus was motivated by interviews in a separate study with local health officials in Michigan who faced ethical challenges in their allocation decisions and expressed their desire to be able to do more with the revenues already available to them.

Our findings add to the public administration and public health practice literatures, reporting three new measures of discretion. Local health officials report the ability to reallocate nearly one-third of all revenues at their discretion, and even higher levels of flexibility in reallocating their personnel time and effort, to better meet the needs of their communities. We identify an association between levels of discretion and per capita expenditures, moderated by the presence of a Board of Health. Our models do not show, however, a significant association between levels of discretion and the proportion of revenues attributed to local sources, contrary to our hypothesis. We also

report a positive association between each of the three measures of discretion and a constructed measure of the proportion of needs that are satisfied for ten public health activities and services.

My third paper, entitled “Ethical Issues in Pandemic Preparedness and Response: Focus Groups for Public Engagement,” synthesizes the findings from a pilot study in community engagement that was conducted prior to the declaration of the current H₁N₁ pandemic. Two unique contributions of this study are: 1) the application of deliberative methods to ethically-laden policy decisions in public health; and 2) the analysis of public attitudes and concerns about the allocation of scarce resources and the burdens of proposed sustained social distancing measures during a pandemic.

Democratic deliberation is a method with a great deal of theoretical support and little empirical backing. We found that our participants showed a capacity for deliberation with a brief education session and a facilitated discussion. They anticipated serious economic and emotional burdens associated with proposed social distancing measures, and they voiced a deep distrust of government in the fair allocation of resources and in the timely distribution of necessary health information to the public. Our participants shared a clear desire for education and opportunities for public input in the policy process.

Through qualitative and quantitative research methods, these studies contribute to the public health systems research goals of building an empirical basis for understanding resource allocation in our public health system.

CHAPTER 2

Resource Allocation in Public Health Practice: A National Survey of Local Public Health Officials

The current system for providing local public health services in the U.S. is complex and widely varied in terms of financing, organization and the provision of services (NACCHO, 2009; Mays, 2008; Mays et al., 2006; Wall, 1998). Recent public health systems research by Mays and Smith sheds new light on the magnitude of this variation. They found that per capita spending on public health services varied by a factor of more than 13 between local health departments (LHDs) in the highest and lowest expenditure groups, with most variation remaining even after controlling for differences in services and population demographics. This far exceeded the well documented variation in spending in the rest of the health care system (Mays and Smith, 2009). In the midst of such uneven spending for public health services, local public health officials (LHOs) are challenged to effectively and equitably meet their communities' needs for disease prevention, containment and treatment. They must make resource allocation decisions that determine which activities and services their departments offer and which population groups will benefit. There is little in the literature describing such allocation processes and their justifications in public health practice. What types of allocation decisions do LHOs make? What processes do they use in decision-making? What factors influence LHOs' allocation decisions? In this study we addressed these questions using data from a nationally representative survey of

LHOs, analyzed in the context of new data about the characteristics of LHDs in the U.S. from the National Association of County and City Health Officials (NACCHO).

Background

Resource allocation decisions are central to public health systems operations, yet little empirical research has characterized the nature and scope of allocation decisions confronted by the officials running LHDs. When allocation by public administrators is assessed, the process is generally described as informal and ad hoc, lacking in the application of formal decision analyses. In his work describing resource allocation in the public sector as a whole, C.M. Fischer suggests that public administrators develop beliefs and sets of values that are then applied heuristically to guide allocation decisions. These heuristics are “mental rules of thumb” that help administrators navigate the complex process of setting priorities (Fisher, 1998, p.26). Fischer groups the values used by administrators in allocation decisions into six categories, including deservingness, individual need, fairness, utility, ecology (i.e., decisions should consider stakeholder concerns), and personal gain and competence. He suggests that, although such informal methods are certainly flawed, if balanced with conceptions of collaboration, control (e.g., between market forces and population needs) and competence, they can move allocation decisions in the direction of the common good (Fisher, 1998).

Informal approaches to allocation decisions may be used, in part, because of the enormous variation both in the way LHDs are funded and governed and in public health needs in communities. Additionally, often there is simply no broad agreement among policy makers on public health priorities. Certainly economists and others have

developed less subjective, more explicit or technically optimal approaches to setting priorities by applying techniques such as cost-effectiveness analyses, yet it is not clear if many public health practitioners use economic analyses, decision frameworks or other formal tools in allocation decisions (Neumann and Jacobson, 2008; Neumann et al., 2008; Neumann, 2004).

In spite of the ad hoc or informal approaches, LHOs strive to make the best allocation decisions for their communities. In an interview study of ethical issues faced by public health practitioners in Michigan, resource allocation decisions constituted a prominent theme. Practitioners struggled to set priorities for allocation of funds and personnel among public health programs, oversaw vaccine allocation during shortages, and anticipated scarcity during disaster preparedness planning. One LHO shared the following view of allocation decision making:

“...we are ethically responsible to the people of this community to address the most pressing health issues I think, and address those to the best of our ability. And certainly an aspect of providing that service is deciding where...the dollars go.” (Baum, et al., 2009).

Local health officials are a significant source of knowledge about public health practice. Practically, they have a major role in determining which services and activities are provided in a community. Philosophically, as stewards of public resources and public trust, LHOs are obligated to make efficient and just decisions for their communities and are expected to help fulfill broader societal concerns for fairness and equity.

Stewardship is identified by the World Health Organization (WHO) and numerous scholars as one of the core functions of managers in any health system. Theories of public stewardship emphasize collectivism and community trust in officials

to both efficiently and ethically serve the public's interest. In 2000, WHO defined stewardship broadly as the "...careful and responsible management of the well-being of the population" under the guise of "good government" (WHO, 2000, p.136).

Stewardship means influencing policies so that all members of a community are valued, as well as providing vision and direction in a health care system. When public officials act as good stewards, citizens see their actions as legitimate, and they trust that officials will act in ways that are beneficial to the communities that they govern and will allocate resources effectively (Nuffield Council, 2006; Travis et al., 2002; WHO, 2000; Saltzman and Ferroussier-Davis, 2000; Murray and Frenk, 2000; Kass, 1990).

Murray and Frenk explicitly list priority setting as one of the main functions of stewardship, along with regulation, advocacy, consumer protection, performance assessment and overall system design (2000). A fair and just distribution of benefits and burdens is essential to public health priority setting processes. Various conceptions of justice (e.g., egalitarian or utilitarian approaches) may offer some guidance for public stewards to ensure fair allocation of limited public health resources. Although distributive theories of justice have been well considered in the health care literature, no one theory consistently guides priority setting procedures in public health (Daniels, 2001). Even social justice and utilitarianism, often referred to as hallmark principles of public health, are not consistently used to guide allocation or other ethical decision making in public health practice (Baum et al., 2009; Gostin and Powers, 2006; Turnock, 2004; Nord, 1999; Krieger and Brin, 1998; Levy, 1998).

This study contributes to the literature by collecting primary data to create a fuller description of the allocation decisions made by LHOs, in the context of new data on characteristics of local health officials and the departments they manage.

Methods

We designed and conducted a national survey of LHOs in the U.S. in 2008-2009. The sampling frame was a list, maintained by NACCHO, of all local health departments (members, non-members and inactive members of NACCHO), including names and contact information for 2820 local health officials.

Survey design. After a thorough review of the literature on resource allocation in public health practice, we consulted with two survey methodologists to design the survey instrument. Questions addressed four broad domains, including: 1) the nature and scope of resource allocation decisions officials confront; 2) the processes officials use when they make allocation decisions; 3) the degree of discretion officials report in allocating resources; and, 4) whether communities' public health needs are met for ten public health services.¹ We did not include questions on topics expected to be included in NACCHO's 2008 National Profile of Local Health Departments (Profile), such as funding sources, governance structure, and expenditures. [See Appendix 2.B for the Survey Instrument]

Once the questionnaire was drafted, we conducted cognitive interviewing with five recently retired local public health officials to assess whether they understood the draft survey questions in the way we intended, and whether they provided adequate answer choices (Willis, 2005). Each interview was conducted via telephone, lasted

¹ Data from domains 1 and 2 are discussed in this paper. Data from domains 3 and 4 will be discussed in another paper focusing on the question of LHOs' discretion in allocation decisions.

approximately one hour. We paid each of the five participants \$20 as a token of appreciation for his time and modified questions based on participant responses. A survey research firm then constructed and administered the final web-based questionnaire. We pre-tested the web-based survey by sending email invitations to 50 LHOs randomly selected within three strata (based on size of the population served by the LHD), proportional to the final sample. Pre-tests also queried respondents about the length of time they spent completing the survey so that we could accurately predict in the e-mail invitations the length of time respondents would need to complete the survey.

Sample design and recruiting. Since the size of the population served by LHDs varies widely and is associated with many other attributes (e.g., types of services offered, types and sources of funds), we stratified the sampling frame by size (large $\geq 500,000$, medium 50,000-499,999, small $< 50,000$). We sampled officials from all large departments since they make up only six percent of all LHDs but deliver services to over 50% of the total U.S. population. Officials were randomly selected within the small and medium strata. Our total final sample was $n=1327$ officials from 121 large, 577 medium and 629 small departments.

In May, 2008 we recruited participants using an email invitation. We did not promise participants confidentiality but did assure them that findings would be reported only in aggregate form. Shortly before sending the email invitations, we emailed officials a letter from a nationally prominent local health official in which he encouraged his colleagues to complete our survey. Survey incentives included a \$15 Amazon gift card as a token of appreciation for time spent completing the survey, and a copy of the final survey report.

Since officials in states with centralized public health systems are often responsible for more than one LHD, some respondents were chosen more than once in our sample. In those situations, we sent respondents a separate email invitation for each department selected, and specified the department in the invitation so that they could answer the survey with the selected department in mind. We sent non-respondents one or two email reminders as the initial surges of responses dropped off. We did not send reminders after mid-June, 2008 because we had agreed not to be actively recruiting participants while the NACCHO Profile study was in the field.² After data collection for the Profile study ended, we sent paper surveys to non-respondents to our web-based survey in early December, 2008. The invitation to complete the paper survey also included a web-link option to complete the survey on-line. As an incentive to complete the paper survey, the invitation letter included a ten dollar Amazon gift card and a University of Michigan pencil (to entice officials to open the envelope). One additional paper survey was sent to non-respondents when the initial surge of responses to the paper survey dropped off, and one final follow-up reminder letter was sent in March, 2009 to non-respondents.

Paper survey data was entered into an Excel spreadsheet by one researcher (NMB) as completed surveys were received by mail. Data from 25% of the paper surveys was again entered into a separate spreadsheet by a research assistant (CG) and compared to assess accuracy of data entry.

This survey data was then linked with data from the 2008 Profile study. The Profile was conducted by NACCHO between July and October, 2008, and is a survey of

² The NACCHO Profile study is a periodic survey of all local health departments. The 2008 Profile was launched in mid-July and sent to all officials in our sampling frame.

all LHDs in the U.S. (n=2,794 in 2008).³ Profile questionnaires were designed to collect data on the structure, function and capacity of LHDs. Overall, 83% of all LHDs (n=2332) responded to the Profile. We merged Profile data with our data using a unique LHD identifier.

Data analysis. Responses to survey questions provide descriptive data for understanding resource allocation in public health practice. Surveys returned by officials who indicated that they had been in their position less than one year (n=68) were omitted from the denominator when calculating response rates. These surveys were omitted because we wanted officials to have experienced at least one complete annual budget cycle in their position to accurately respond to many of our survey questions. Data from pre-testing was also excluded from analyses. The proportion of missing data was assessed for each variable. To assess whether data were missing systematically, we compared respondents with and without missing data on key variables (for future multivariate analyses). Items missing at greater than 10% were assessed to determine whether there were patterns, using the `mvpatterns` command in STATA. This command displays not only which responses are missing at which rates, but also aggregates missing data to display the numbers of respondents who omit each combination of missing responses. A composite analytic weight was also constructed for each of the three strata to reduce bias in the sample estimates. The weight adjusts for unequal probability of selection into the sample, differences in response rates, and stratification, to be consistent with the overall population of LHOs in the U.S. (Lee and Forthofer, 2006). [See Appendix 2.1 for construction of analytic weights.] Descriptive statistics were generated

³ Geographically, both Hawaii and Rhode Island were excluded from the Profile because there are no sub-state local health units.

without imputation. All analyses were conducted using STATA 10.1 software, using the `svy:` command to correct for complex sampling designs.

Descriptive statistics included mean, range and standard deviation for continuous variables and proportions and ranges for categorical variables, identification of outliers and examination of missing data. Bivariate analyses included chi-square tests to determine relationships between categorical variables and between subgroups within categorical variables (for size categories), and simple regression for continuous variables.

This study was approved by the University of Michigan Medical School's Institutional Review Board.

Findings

The web and paper surveys combined included $n= 685$ responses from local public health officials, all of whom had been in their positions more than one year. The overall response rate was 53%. This rate varied somewhat by strata, with small departments responding at 50%, and medium and large responding at 55%. After merging our survey data with the 2008 NACCHO Profile data, we had a final sample size of $n= 608$ LHOs. By size of the population served, there were 258 respondents from small, 292 from medium, and 58 from large departments.

Most data items were missing at rates less than 10%. However, data on revenue sources were missing at rates of 15-26%, with data from small and medium LHDs missing at somewhat higher rates than large departments. Data on LHO licensure was missing at rates of 14% for large LHDs, 13% for medium LHDs and 16% for small LHDs. No other patterns were identified in the missing data.

Data were weighted for selection probability, survey response rate and stratification to reflect the full population of LHOs (Groves, et al, 2004).

[See Appendix 2A for weights.]

Local Health Official Demographics. On average, our respondents were 53 years old and had nearly ten years experience (median 7years) in their positions running LHDs. Officials running small departments were more often white and female than those heading medium and large departments. While just 2% of all departments were headed by African American officials, 11% of those running large departments identified themselves as African American.

Local health officials reported varied levels of educational preparation. Officials from small departments were significantly less likely to hold a masters or doctoral degree than officials in the other two strata. While overall only 15% of all LHOs held a doctoral degree, 62% of those running large departments held a doctoral degree of some type. Large departments were far more likely to be run by physicians, while small departments were more likely to be run by registered nurses. Medium sized departments were also significantly more likely to be run by environmental health specialists than were large departments.

[See Table 2.1 for LHO Demographics.]

Characteristics of Local Health Departments. Governance of LHDs is often characterized as either centralized at the state level or decentralized at the local level. Eighty-six percent of our respondents ran departments that were governed locally (e.g., a local Board of Health or County Council has the authority to hire/fire the LHO) rather than by a state agency.

Of all LHDs, 79% had a Board of Health (BOH), and the proportion with a BOH decreased as size of the department increased. Thirteen percent of all LHDs had members elected to their BOHs. Others were appointed or designated by statute to serve based on an elected (e.g., county commissioner) or non-elected (e.g., school superintendent) position. For nearly half of all departments, the BOH had the authority to approve the LHD budget. County governments (e.g. county councils, commissioners, executives or boards of supervisors) also approved the budgets of half of LHDs. City or state governments approved LHD budgets much less often. Local BOHs usually did not have the authority to impose taxes for public health activities; this was most often a function of county or city government. Boards of health generally were responsible for adopting public health regulations and setting regulatory and patient fees. County government had the authority to request a public health levy for over half of departments, but BOHs had this authority for over a third of small departments.⁴

The majority of respondents worked in departments with jurisdiction over just one county, seven percent over multiple counties, and one quarter over a city, town or city/county. None of the departments in this survey had jurisdiction over an entire state.

[See Table 2.2 for LHD Characteristics.]

Revenues and Expenditures. Local health departments drew revenues from a wide variety of sources. The largest proportion of revenues (20%) for all LHDs came directly from states. The second largest source of revenues (19%) came from counties, and federal money passed through states was the third largest source (17%). When taken as a group, local revenue (county + city) was the largest source of funds, and this did not

⁴ For governance questions (i.e., questions about authority to approve budgets, impose taxes, adopt regulations and set fees), respondents were encouraged to select all answers that applied from BOH/County government/City or Town government/ State agency/Other.

vary significantly by size. Medicaid made up ten percent of revenues overall, but small departments received a significantly greater proportion of revenues from Medicaid than medium or large departments. Regulatory fees, cities and other sources each provided about 7% of revenues. Medicare accounted for five percent of total revenues, but again, small departments drew a significantly larger proportion of revenues from Medicare than did larger departments. Patient fees, federal direct funds, private foundations, private insurance and tribal sources each made small contributions to LHD revenues.

Although the largest sources of revenue did not vary greatly by size of the population served by the LHD, there were numerous significant differences when revenues were compared by governance structure (state v. local). Revenues from states and from Medicaid made up much larger proportions of revenues for state governed LHDs, while county revenues and federal pass-through funds accounted for more revenues for locally governed departments. Regulatory fees and revenues from city sources accounted for just one to two percent of revenues for state governed departments, but 8% each for those governed locally. Revenues from patient fees, private foundations and private health insurance accounted for small proportions of revenues, but also varied by governance structure. The only sources that did not differ significantly by governance category were Medicare, Federal direct funds, tribal and other sources.

Median per capita expenditures were \$36.10 for all LHDs in the most recently completed fiscal year.⁵ The larger the size of the population served by the department, the greater the per capita spending. Departments governed at the local level had lower per capita expenditures than those governed at the state level.

⁵ According to the NACCHO Profile report (2009), fiscal years for LHDs vary, with 36% ending December 31, 2007 or earlier, 23% ending January 31, 2008, and 41% ending after January, 2008.

Types of Resource Allocation Decisions. We asked respondents the extent to which they shifted resources among population groups, added or eliminated the activities they offered and adjusted the funding to such activities. Overall, 61% of LHOs reported shifting resources among population groups *very little or not at all*. Officials in small departments reported even less shifting of resources than their counterparts from larger departments.

We also asked respondents the extent to which they changed the way they allocated their own time, as well as that of their staff and contractors working for them. Seventy-eight percent said they had changed the way they allocated their own time *to some extent or to a great extent*. A somewhat lower proportion changed the tasks that their staff performed, with 63% responding that they did so *to some extent or to a great extent*. Only 21% directed contractors to change their tasks to the same degree.

Over half of all officials reported adding activities offered by their department *to some extent or to a great extent*. In contrast, only 35% said they eliminated activities to the same degree, and small departments were significantly less likely to eliminate activities than medium sized departments. When asked about funding changes, 46% of officials said they increased funds to one or more activities *to some extent or to a great extent* in the past year. Similarly, 46% reported decreasing funds to one or more activities to the same degree, although small departments did so less than others. None of the responses to these questions differed significantly by governance category (state vs. local).

[See Figure 2.1 for Types of Allocation Decisions.]

Compared to the year prior, the number of staffing full-time equivalents (FTEs) remained constant in 57% of small departments, but lower proportions of medium and large departments reported such constancy. The level of change in staffing varied substantially by governance category, with FTEs in over half of locally governed departments remaining constant compared to 31% of those from state governed departments. Only five percent of small departments reported that their allocation of FTEs *changed greatly*, compared to 8% of medium and 9% of large departments.

Allocation decisions during an emergency. Nearly one-third of respondents answered affirmatively to at least one question about managing resources during an actual emergency in the past year. Twenty percent of all officials reported that they had to determine how to allocate funds during an emergency, and 14% faced the task of determining how to manage an expected shortage of both biological and non-biological resources. A much larger proportion (28%) had to manage staffing shortages during an emergency.

Allocation decisions during non-emergencies. Even when not managing an emergency, seven percent of officials reported having to manage acute shortages of medications, with nearly one-third reporting that they managed shortages of vaccines. Overall, 39% of officials reported managing an acute shortage in their workforce, but this was less of a problem for small departments. Officials in the more centralized, state-governed LHDs reported having to manage shortages of vaccines and medications at higher proportions than those in locally governed departments.

While planning for a future emergency, over 80% of officials made determinations about allocating disaster planning funds, and planned to manage a staffing

shortage. Three quarters planned to manage a shortage of biological resources, but only 14% planned to manage a shortage of non-biological resources such as beds or oxygen.

Processes Used to Make Allocation Decisions. We asked respondents about the frequency with which they consulted staff and colleagues when making allocation decisions. Overall, 83% of officials *usually* or *always* consulted their staff during allocation decision-making, but this was more common in large departments than in small ones. Officials generally did less consulting with colleagues in other LHDs than with their own staff, but officials in small departments consulted such colleagues more frequently than those in medium and large departments. It was less common for officials to consult colleagues at the state level, with only one-third reporting they *usually* or *always* took such action. Just over half of all respondents *usually* or *always* consulted their BOHs or county councils when making allocation decisions, but this was more common for small departments than for large. In addition, sixty-one percent of all respondents *usually* or *always* reviewed government guidelines for allocation. Less than half, however, *usually* or *always* used economic analyses (e.g., cost-effectiveness analyses; program budgeting and marginal analysis) or conducted needs assessments. One-third of respondents reported *usually* or *always* using decision tools in the allocation decision process. [See Figure 2.2 for Processes Used to Make Allocation Decisions.]

Influential factors in allocation decisions. Of the fifteen factors presented to respondents, five were chosen by more than half as *very influential* when making resource allocation decisions. They included: the effectiveness of the activity (64%), previous allocations (62%); being the sole provider of an activity in the community (61%); reluctance to lay off employees (56%); and influence from a BOH (53%). Results

from decision tools, input from the public, colleagues in other departments, County Council, and a state health department were considered to be the least influential. Factors seen as moderately influential included staff input, government guidelines for allocation, public expectations, results from economic analyses, and needs assessments.

Factors of influence varied only slightly by strata and governance category. Officials from small departments reported greater influence from BOHs and colleagues than their counterparts in medium and large departments. Officials from state-governed departments reported that decision-tools and input from the state health department were more influential than those governed locally.

[See Table 2.4 and Figure 2.3 Influential Factors in Allocation Decisions.]

Discussion

As stewards of public resources and experts in the delivery of public health services, LHOs are challenged to allocate limited funds, staffing and other resources to meet the public health needs in their communities. It is clear from our findings that there is a great deal of variation both by size of department served and by governance structure in these allocation processes. However, all officials reported little shifting of funds to address particular population needs, and shared factors that were influential in their allocation processes.

We have long recognized that major differences exist among LHDs in the services and activities they provide, so it was not surprising to see variation in per capita expenditures among LHDs. In particular, the level of clinic services provided varies greatly among departments, as does the amount of environmental health activity. As the

NACCHO Profile report and others point out, differences in expenditures are associated with variation in community need for public health services, the extent to which environmental and clinic services are offered, as well as simply the variation in wealth and capacity of communities to generate local revenues and provide a range of services (NACCHO, 2009; Skutchfield and Keck, 2009). In this sample, median per capita expenditures were greater for larger departments and for those with more centralized governance structure. Larger departments likely have the capacity to deliver a wider range of public health services and activities than small departments, and departments governed at the state level may provide a higher level of clinical services (as evidenced by the significantly higher proportion of revenues from Medicaid) than those governed locally. Clearly, further studies like that of Mays and Smith (2009) are needed to gain a deeper understanding of the sources of variation in per capita expenditures.

It is also not surprising that sources of revenue varied by governance structure. Centralized public health systems do not have the same infrastructure at the city or county level that locally governed LHDs have to influence local leaders or to levy local funding for public health activity. Similarly, locally governed departments do not have authority over state resources, and state authorities no doubt expect local governments to make significant revenue contributions to local public health.

Officials reported little shifting of resources from one population group to another. In contrast, they reported changing the ways they spent their own time, and redirected their staff, to a far greater extent than they shifted resources. While officials may not be able to shift funds because of categorical or other restrictions on funding sources, they may instead be able to emphasize different activities or services by

adjusting how they spend their own time and the tasks their staff perform. An official may decide, for example, to keep a clinic open an extra half day per week, and may redirect nurses to staff that clinic in lieu of making home visits. Such redirection would obviously be limited by staff skills, licensure, and other constraints, but may be an effective way to shift services among population groups when officials cannot directly divert funding. It may spur more cross-training of staff for various roles, much like has happened in some LHDs as a result of increased demand for staff with emergency preparedness and response skills (Lurie et al., 2006). Officials from small departments reported even less shifting of resources and redirecting of staff than their counterparts at larger departments. This may be due to both lower funding levels (lower per capita expenditures) and less capacity within their staffing pool to perform a wide variety of tasks. If there is no excess capacity, either in terms of funding or staffing, there may be little opportunity to make any adjustments at all. Alternatively, the lack of flexibility in shifting resources reported here could, instead, indicate that there is little need for reallocation of funds among population groups, but given the enormous unmet need in most public health settings and little evidence of adequate resources, this explanation seems less likely.

Our results demonstrate that resource allocation decisions are made collaboratively in most LHDs. The vast majority of officials consult staff when setting priorities, and many reach out to colleagues in other LHDs and at the state level. Officials running small departments most often reported acting collaboratively with their peers from other LHDs and consulting the state-level staff, and consulted their BOHs for guidance or approval. They may be more isolated professionally or may have fewer

resources at their fingertips than their colleagues. Input from a BOH was reported as one of the most highly influential factors in allocation decisions. Clearly governing authority for BOHs varies, but even those functioning only as advisory bodies are likely important sources of expertise, public views and perhaps support for difficult allocation decisions. While officials may gather valuable information from colleagues and governing authorities, well over half of all officials surveyed reported that they *sometimes* or *never* conduct needs assessments when making allocation decisions. To be sure, needs assessments can be time consuming and expensive, and this alone likely explains our findings. Yet assessment is one of the three core functions of public health as established by the Institute of Medicine (along with policy development and assurance), and is foundational for planning and priority setting activities (Turnock, 2004; Petersen and Alexander, 2001). In extremely resource poor areas, needs assessments may appear to be of little value if officials know there are insufficient resources to treat the needs that are identified. Ideally, however, LHOs would set priorities with complete and updated information about their communities' public health needs.

Our findings reinforce conventional wisdom that it is generally harder to eliminate activities or services offered in a LHD than it is to add them. This difficulty in eliminating activities was more pronounced for small departments than for medium or large LHDs. It is likely that small departments find themselves to be the sole provider of certain services in their communities more often than larger departments. If considered in light of our finding that being the sole provider of a service is one of the most influential factors in allocation decisions, it is clear that eliminating activities might be even more difficult for small LHDs.

Given the emphasis on emergency planning and response in public health practice in the past decade, most officials are, no doubt, well versed in their departments' plans for managing staff shortages and scarcity of vaccine during an infectious disease outbreak or other emergency. Our findings suggest, however, that nearly 40% of LHOs must manage acute staffing shortages even when they are not under the pressures of a public health emergency. This, too, is consistent with long-standing worries about inadequate funding in the public health system and the resultant inadequate capacity for meeting public health needs (IOM, 2003). Acute staffing shortages greatly complicate not only the task of addressing everyday public health needs, but obviously also complicate the management of even greater staffing limits expected during many types of public health emergencies. In a field as labor intensive as public health practice, emergency planning and response must naturally focus largely on managing acute staffing shortages. Federal and state guidelines to LHDs for pandemic response, however, offer little practical guidance about how best to manage staff shortages, despite wide expectation of such shortages.

Officials reported that the effectiveness of a service or activity was the most influential factor in their resource allocation decisions. Clearly the concept of evidence-based public health practice, which has been broadly supported in the literature and specifically in research agendas in Public Health Systems and Services Research (Robert Wood Johnson Foundation, 2009), has been widely accepted by LHOs. What is not clear, however, is whether officials actually have access to relevant data from studies that evaluate the services and activities that they provide, or have the capacity to collect and analyze their own data on effectiveness. According to Brownson and colleagues (2003),

there is a paucity of scientific evidence for most of what is done in public health, just as there is limited evidence for effectiveness in much of what is done in the broader health care system. The empirical evidence for effectiveness that does exist appears to be highly valued by LHOs. In addition to little evidence of effectiveness, officials do not report that decision tools or economic analyses are particularly influential in their decision processes. This may be due to a lack of expertise in applying these techniques or to a dearth of useful tools. It may also be that LHOs are skeptical of the benefits of formalizing decision processes; they may feel that their professional experiences and knowledge of their communities are adequate guides in allocation processes.

It was not surprising that officials depended heavily on the previous year's budget to help determine the next year's allocation scheme. Demand for many public health services may not change greatly from one year to another in a particular community (e.g., the number of restaurants or campgrounds that require inspection may remain fairly stable), and it may not seem efficient to consider anything more than the incremental changes to the previous year's budget that are required each year. Moving to a zero-based budget – one that requires annual justification of the entire budget rather than acceptance of the prior year's budget with some annual modifications – is no doubt substantially more time consuming and complicated for LHOs. Nonetheless, heavy reliance on previous budgets can mean a perpetuation of weaknesses (and strengths) in previous decisions, and a focus on line-items as opposed to the broader public health goals the LHD is trying to achieve (Finkler and Ward, 1999).

Most officials (86%) reported that public expectations were moderately or very influential in allocation decisions. In contrast, direct public input (e.g., public meetings)

had nearly the lowest impact of all the fifteen factors. One explanation for these seemingly incongruous findings is that LHOs have (or create) few opportunities for any type of direct public input, and instead gain an understanding of public expectations from an elected BOH or County Commission. Citizen input in government processes can take many forms, including public hearings, community surveys and more participatory methods such as focus groups, citizens' juries or forums, but these processes are not widely used in public health in the U.S. to gauge public perspectives on setting priorities. An important construct of stewardship is that citizens must see governing officials' actions as legitimate. Creating more situations for direct public input could offer legitimacy to LHOs' processes for setting priorities among populations and services in local public health settings (Abelson et al., 2003; Simonsen and Robbins, 2000; Lenaghan, 1999; Smith and Wales, 1999; Gutmann and Thompson, 1997).

Finally, we see interesting variation in individual demographic characteristics of LHOs. Do gender roles or professional hierarchies have any role in shaping the ways that resources are allocated in public health? Are female nurses, running small LHDs as influential in garnering resources from county, state or federal governments as their male, physician counterparts at large LHDs? Do men and women have the same priorities for public health services in a community? Nearly one-quarter of officials running medium sized departments were sanitarians or environmental health specialists, a much higher proportion than for either small or large departments. Does the professional background of the LHO affect which activities or services are funded? These are largely sociological questions and are beyond the scope of this paper, but they may warrant further exploration.

Limitations. To our knowledge, this is the first attempt to collect and analyze data about the types of resource allocation decisions LHOs make, the processes they use in allocating resources, and the factors that influence those decisions. For this reason we were not able to use previously validated questions in our survey tool. In addition, we analyzed our data using the size of the population and governance structure as comparison groups, but there may be other important comparison groups (e.g., by state) that we did not identify in this analysis that could reveal additional, important findings. Finally, using only cross-sectional data we were not able to capture potentially important changes in allocation decision making that may occur over time.

Conclusions and implications for further research.

This descriptive study is a first look at primary data focused on allocation decisions in public health practice. It is clear that local health officials take seriously their responsibility to fund activities and services that are known to be effective. Public health systems research should continue to expand its focus by emphasizing effectiveness research and the translation of that research into practice. It may be useful to explore the factors that limit officials' flexibility in allocating resources, and whether greater flexibility would bring public health benefits to their communities.

Future research should develop a clearer understanding of the relative benefits and limitations of heterogeneous funding and service structures, and assess the impact on both efficiency and equity in allocation of resources. It may be valuable for LHOs to assess the potential usefulness of more structured methods for allocation decisions, such

as evaluation frameworks (e.g., Jacobson and Neumann, 2009), economic analyses or other decision aids.

Expansion of opportunities for public engagement in public health priority setting or other processes may strengthen ties between LHDs and their communities, and may offer new avenues for communication and cooperation. In the face of staffing shortages, tight budgets and unmet need, the community may be able to provide significant assistance in addressing public health issues and in maintaining legitimacy during emergencies.

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Table 2.1: Demographic Characteristics of Local Health Officials

<u>Characteristic</u> (Population size)	<u>Total n=608</u>	<u>Small n=258</u> (<50,000)	<u>Medium n=292</u> (50,000-499,999)	<u>Large n=58</u> (≥500,000)
Years Experience (mean)	9.9	10.3**^L	9.9	7.8
Age (mean)	52.7	52.4*^L	53.0	54.8
Female (%)	57.3	64.0**^{ML}	46.7**^{SL}	27.6
Race (%)				
White	96.2	98.0**^{ML}	93.4	87.7
Black/African American	2.0	0.4**^{ML}	4.5	10.5
American Indian/Alaska Native				
Asian	0.5	0.8	0.0	0.0
Native Hawaiian/Other Pacific Islander				
Other	1.3	1.2	1.4	1.8
Ethnicity (%)				
Hispanic	0.1	0.0	0.4	0.0
Education (%) (highest)				
Doctoral degree	15.0	8.1**^{ML}	23.6**^{SL}	62.1
Masters degree	40.0	31.8	61.0**^{SL}	31.0
Bachelor's degree	33.8	45.0**^{ML}	13.0*^L	3.5
Licensure (%)				
MD	10.2	4.2**^{ML}	18.2**^{SL}	46.0
RN	40.1	50.2**^{ML}	21.3	16.0
REHS/RS	19.9	18.4	24.9*^L	8.0

* Statistically significant at the 5 percent level.

** Statistically significance at the 1 percent level.

^{S, M, L} Significantly different from the estimate for small, medium, or large LHDs respectively.

Table 2.2: Local Health Department Characteristics

Characteristic (Population size)	Total n=608	Small n=258 (<50,000)	Medium n=292 (50,000-499,000)	Large n=58 (≥500,000)
Population				
Mean	109,829.3	21,684.2	148,066.8	1,208,135
Median	59,170.5	19,189.5	111,473	824,704.5
Governance (%)				
State	14.0	14.0	17.5	21.7
Local	86.0	86.1	82.5	79.3
Has a Board of Health	78.6	81.9* ^L	73.6* ^{SL}	59.3
BOH appointed	50.1	49.0	55.6	41.8
BOH elected	12.9	17.8** ^{ML}	3.2	1.8
Budget Approval (%)				
BOH	47.5	52.2** ^{ML}	40.8** ^{SL}	22.4
County	51.1	49.6	53.1	60.3
City/town	18.0	18.4	17.1	17.2
State	16.0	14.1	19.5	20.7
Other	3.6	3.5	4.1	1.7
Tax Authority (%)				
BOH	14.7	17.1* ^{ML}	9.0	3.6
County	61.4	59.3* ^L	65.5	67.3
City/town	21.6	19.0* ^M	27.0	25.5
State	16.1	15.8	16.2	20.0
Other	11.2	9.5	14.4	16.4
Set Impose Fees (%)				
BOH	55.0	60.4** ^{ML}	46.5* ^L	29.3
County	43.6	38.7** ^{ML}	52.1	60.3
City/town	18.8	15.6* ^{ML}	24.1	31.0
State	28.2	27.0	30.7	31.0
Other	4.7	4.3	5.9	3.5
Request Levy (%)				
BOH	29.6	33.7** ^{ML}	23.2** ^{SL}	7.4
County	57.5	55.6	60.2	68.5
City/town	19.4	18.5	20.8	24.1
State	13.0	12.8	12.5	20.3
Other	9.6	8.6	11.0	14.8
Adopt Regs (%)				
BOH	59.8	66.0** ^{ML}	49.7* ^L	32.8
County	43.5	39.5* ^{ML}	51.0	53.5
City/town	20.7	16.4** ^{ML}	28.4	32.8
State	34.6	32.0	38.7	44.8
Other	2.0	1.6	2.7	3.5

Figures in table represent means or proportions.

* Statistically significant at the 5 percent level.

**Statistically significant at the 1 percent level.

^{S, M, L} Significantly different from the estimate for small, medium, or large LHDs respectively.

Table 2.3: Local Health Department Revenues and Expenditures

	<u>Total</u> (n=608)	<u>Small</u> (n=258)	<u>Medium</u> (n=292)	<u>Large</u> (n=58)	<u>Local Gov</u> (n=517)	<u>State Gov</u> (n=91)
Expenditures						
Median	\$2,129,382	\$858,603	\$4,476,582	\$40,600,000	\$1,876,675	\$3,400,000
per capita	\$36.10	\$35.69	\$36.17	\$40.18	\$35.57	\$41.14
Mean	\$14,100,000	\$1,887,064	\$6,150,168	\$110,000,000	\$15,100,000	\$8,378,645
per capita	\$88.02	\$135.69	\$44.24	\$105.47	\$94.65	\$51.59
Total Revenues						
Median	\$2,210,842	\$778,000	\$4,230,828	\$44,200,000	\$1,969,572	\$2,872,479
Mean	\$13,100,000	\$2,085,667	\$6,046,055	\$97,200,000	\$14,000,000	\$8,276,407
Revenues by source (%)						
City/town	6.7	6.0	8.3	7.4	7.7	0.4**
County	18.5	18.3	18.8	19.1	20.2	8.2**
State	20.0	19.4	21.1	23.9	17.8	32.1**
Federal pass-through	16.7	15.8	18.2	18.7	17.3	12.6**
Federal direct	2.0	1.3** ^L	1.8	5.7	1.6	2.1
Medicaid	10.4	11.8** ^{ML}	8.1	7.2	8.1	25.1**
Medicare	5.0	6.1** ^{ML}	3.4	1.4	5.3	3.1
Private foundations	1.4	1.7** ^L	1.0	0.5	1.6	0.5**
Private insurance	0.9	0.9	1.0	0.7	1.0	0.5*
Patient fees	4.0	4.4	3.5	3.2	4.4	2.2**
Regulatory fees	7.0	6.8	7.8	5.6	8.0	2.2**
Tribal sources	0.0	0.0	0.0	0.0	0.0	0.0
Other	6.5	6.8	6.1	5.8	6.6	5.9

Figures for revenues by source represent proportions.

* Statistically significant at the 5 percent level.

** Statistically significant at the 1 percent level.

^{S, M, L} Significantly different from the estimate for small, medium, or large strata respectively.

Table 2.4: Influential Factors in Allocation Decisions

	Not influential	Not very influential	Moderately influential	Very influential
Effectiveness of activity	1.0	4.1	30.9	64.1
Previous allocation	0.5	3.2	34.7	61.5
Sole provider	2.0	6.6	30.8	60.5
Reluctance lay off	4.9	8.0	31.3	55.8
Input from BOH	6.0	12.2	29.3	52.6
Input from staff	0.3	4.6	47.3	47.7
Government guidelines	5.9	16.0	34.2	43.9
Needs assessments	4.1	16.9	46.4	32.6
Input County Council	15.3	21.6	31.5	31.6
Public expectations	1.6	12.0	56.1	30.1
Economic analyses	9.2	21.4	43.2	26.2
Input from State	8.5	26.6	39.6	25.4
Direct public input	11.4	28.8	43.4	16.4
Decision tools	16.1	27.7	41.1	15.2
Consult colleagues	5.7	32.4	49.8	12.1

Figures represent proportions.

Figure 2.1

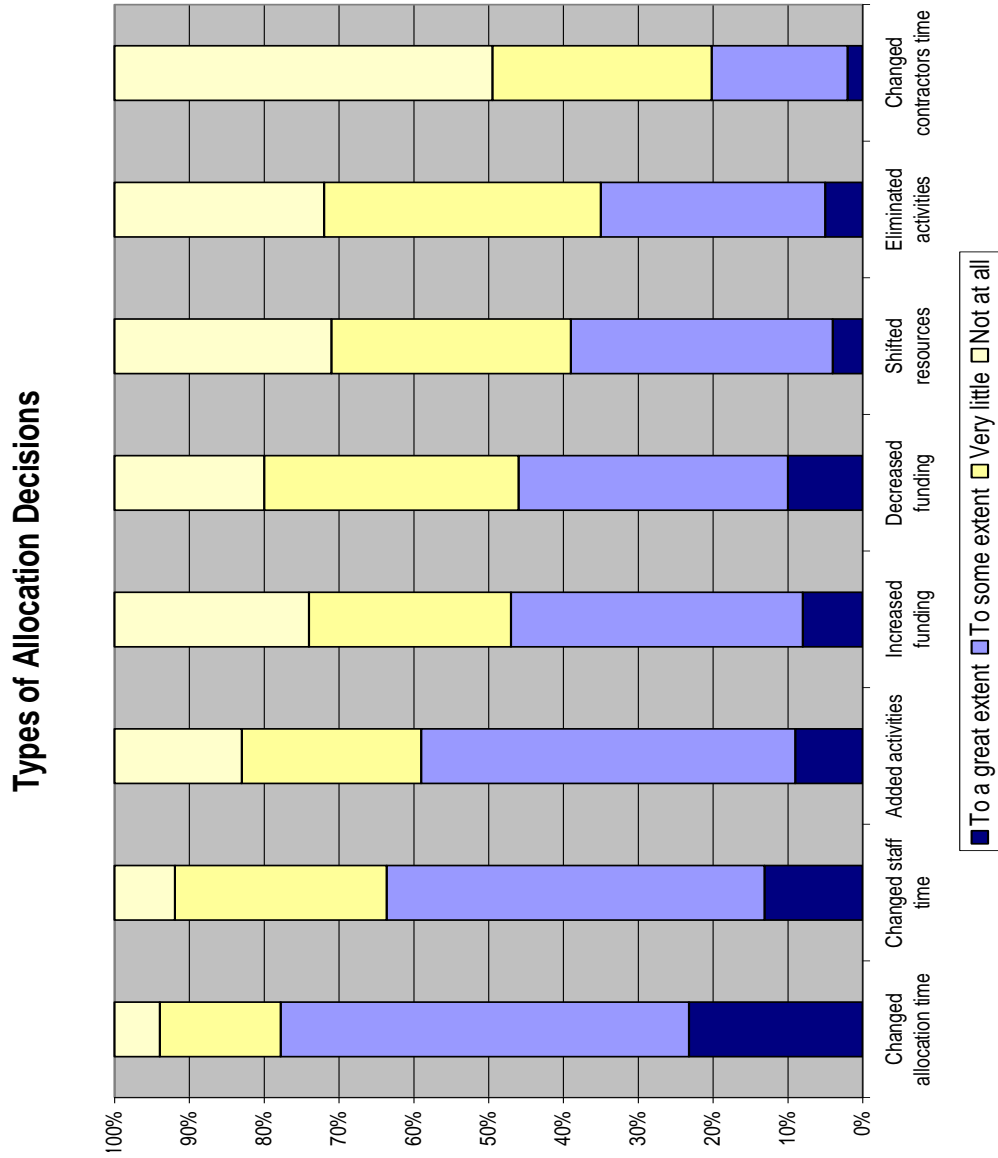


Figure 2.2

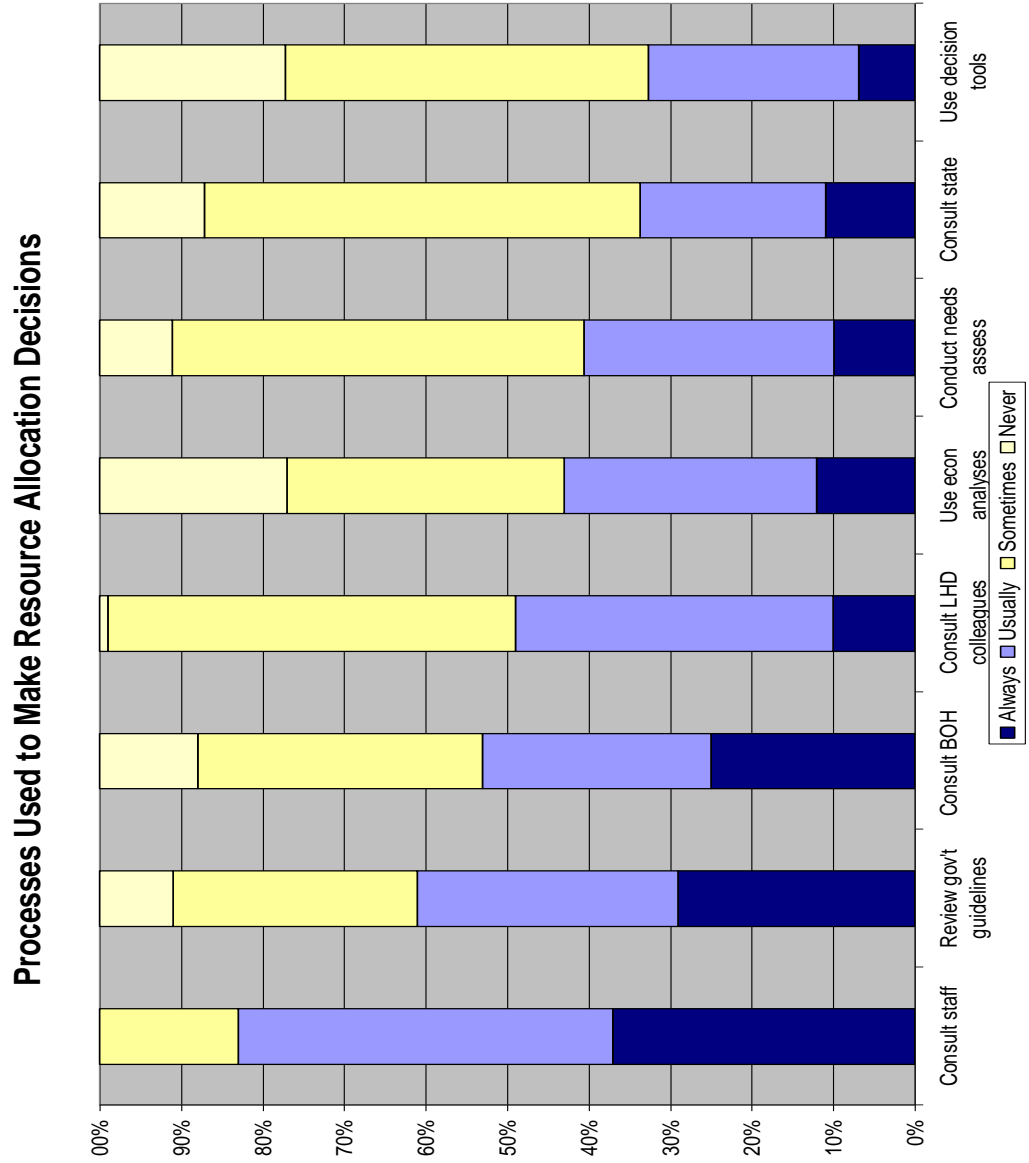
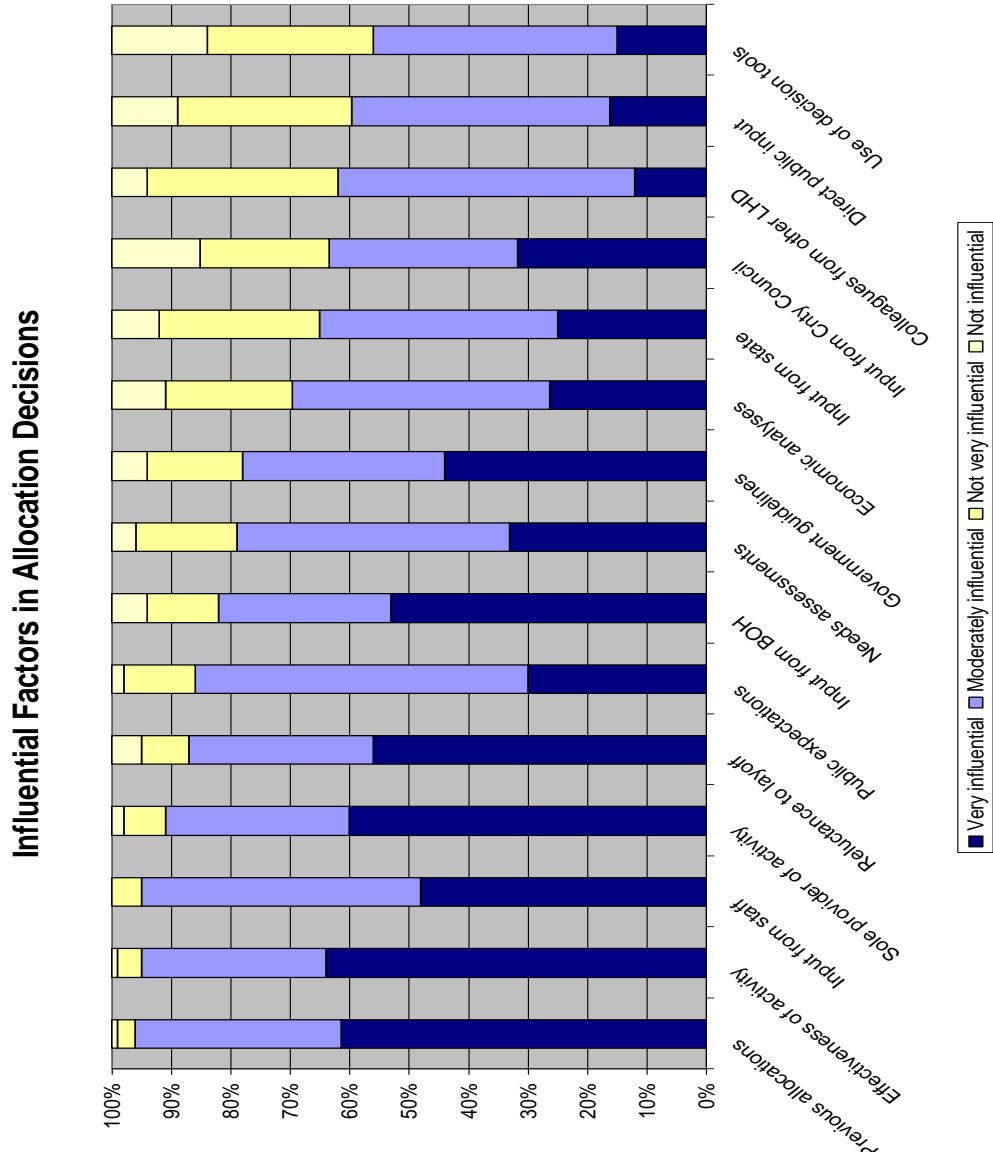


Figure 2.3



APPENDIX 2A: Analytic Weights

Selection Weight	Selection Probability	S. Wt = 1/prob of selection
Large	121/121	1.00
Medium	577/828	1.44
Small	629/1855	2.95
Response Rate Weight n=677	Response Rate*	RR Wt = 1/response rate
Large	63/115	1.83
Medium	309/563	1.82
Small	305/611	2.00
Post-stratification Weight n=608 (merged)	Weighted sample size	P. Wt = (ratio in pop.)/(ratio in weighted sample)
Large	$58*1*1.83 = 106.14$	$(121/121)/(106.14/106.14) = 1$
Medium	$292*1.44*1.82 = 765.27$	$(828/121)/(765.27/106.14) = 0.95$
Small	$258*2.95*2.00 = 1522.20$	$(1855/121)/(1522.20/106.14) = 1.07$
Final Weight		(S. Wt)*(RR Wt)*(P. Wt)
Large		$1*1.83*1 = 1.83$
Medium		$1.44*1.82*0.95 = 2.49$
Small		$2.95*2.00*1.07 = 6.31$
Mean Final Weights	4.05	
		Normalized Final Weights
Large		$1.83/4.05 = 0.45$
Medium		$2.49/4.05 = 0.61$
Small		$6.31/4.05 = 1.56$

APPENDIX 2.B SURVEY INSTRUMENT



The University of Michigan
Department of Health Management & Policy
School of Public Health
109 Observatory
Ann Arbor, MI 48109-2029
FAX 734-764-4338



Resource Allocation in Public Health Practice

The purpose of this survey is to gain a broader understanding of the types of resource allocation decisions that local health officials confront in their work, the processes used to make allocation decisions and the constraints that affect those decisions.

Contact information:
Susan D. Goold, MD, MHSA, MA, Principal Investigator
University of Michigan
Bioethics Program
300 N. Ingalls, 7C27
Ann Arbor, MI 48109-5429
734-936-5222
Approved by University of Michigan IRB# HUM00013897

What is your current position? _____

Have you been in your current position at least one year? (select only one) Yes No,
If you checked no, please stop here and return the survey in the envelope provided

How many years have you been in this position? (please round to the nearest whole number; no fractions or decimals) _____

The first six questions ask about the types of resource allocation decisions you make in your work.

1. In the most recently completed fiscal year, to what extent did you do each of the following [select one for each]:	Not at all	Very little	To some extent	To a great extent
a. Shifted resources from one population group to another.				
b. Added activities offered by (or contracted for) your department.				
c. Eliminated activities offered (or contracted for) by your department.				
d. Increased funding to one or more activities.				
e. Decreased funding to one or more activities.				
f. Changed the way you allocated your time to emphasize particular tasks.				
g. Directed your staff to change the tasks they perform, including retraining in new skills.				
h. Directed contractors to change the tasks they perform.				

	Decreased greatly	Decreased somewhat	Stayed the same	Increased somewhat	Increased greatly
2. Compared to last year, the number of FTEs in your department.					

	Stayed the same	Changed somewhat	Changed greatly
3. How much has the allocation of FTEs in your department changed in the past fiscal year? (e.g., Greatly increased number of sanitarians)			

4. In the most recently completed fiscal year, did you have to manage an acute shortage of any of the following in a non-emergency situation : [check yes or no for each]	Yes	No
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a. Vaccines		
b. Medications		
c. Work force		
d. Other (specify)		

5. In the most recently completed fiscal year, did you do any of the following in the process of planning for a public health emergency : [check yes or no for each]	Yes	No
a. Determine how to allocate emergency or disaster planning funds?		
b. Decide how to manage an expected shortage of biological resources (e.g., vaccines) in a potential public health emergency or disaster?		
c. Decide how to manage non-biological materials or equipment (e.g. beds; antiviral medications; oxygen; space) expected to be in short supply during a public health emergency or disaster?		
d. Determine how to manage staffing shortages expected during a public health emergency or disaster?		

6. In your most recently completed fiscal year, did you do any of the following in response to an actual public health emergency : [check yes or no for each]	Yes	No
a. Determine how to allocate funds?		
b. Decide how to manage an expected shortage of biological resources?		
c. Decide how to manage non-biological materials or equipment (e.g. beds; antiviral medications; oxygen; space)?		
d. Determine how to manage staffing shortages?		

The next two questions ask about the processes you use to make allocations decisions in your work.

7. When making allocation decisions how often do you do the following:	Never	Sometimes	Usually	Always
a. Consult staff/personnel?				
b. Consult colleagues in other local health departments?				
c. Consult colleagues at the state health department?				
d. Consult Board of Health or County Council?				
e. Review governmental guidelines for allocation?				
f. Use economic analyses (e.g., cost-effectiveness analyses, Program Budgeting and Marginal Analysis)?				
g. Conduct needs assessment(s)?				
h. Use decision tools or prioritization tools?				

8. When making resource allocation decisions, how influential are each of the following: [Select one for each.]	Does not apply	Very influential	Moderately influential	Not very influential	Not influential
a. Previous allocations [Prior year's budget]					
b. Input from staff/personnel					
c. Reluctance to lay off employees					
d. Colleagues from other health departments					
e. Input from state health departments					
f. Governmental guidelines for allocation					
g. Input from Board of Health					
h. Input from County Council					
h. Public expectations					
i. Direct public input (e.g., public meetings)					
j. Effectiveness of activity					
k. Results of economic analyses					
l. Results from the use of decision tools					
m. Results from community needs assessment					
n. Sole provider of an activity in the community					




The next three questions ask about the amount of discretion you have in allocating resources.




	Unable to Rate	Complete control	A great deal of control	Moderate control	A small amount of control	I have no control
9. Overall, how much control do you have over the resource allocation decisions in your department?						




10. What proportion of your department's total funds (from <u>all</u> sources) can you reallocate, at your discretion, to better meet the health needs of your community? [0% -100%]	_____ %
--	---------




11. What proportion of your department's total personnel time and effort can you reallocate, at your discretion, to better meet the health needs of your community? [0% -100%]	_____ %
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The following questions ask how, if you had complete discretion, you might modify current allocations to respond to your community's needs, remaining budget neutral.

12a) Are community needs for <u>adult immunization</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on adult immunization? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease to increase funding to adult immunization?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>




12b) Are community needs for <u>lead screening</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on lead screening? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease in order to increase funding to lead screening?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>




12c) Are community needs for <u>emergency preparedness</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on emergency preparedness? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease in order to increase funding to emergency preparedness?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>

12d) Are community needs for <u>food service establishment inspection</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on food service establishment inspection? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease in order to increase funding to food service establishment inspection?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>




12e) Are community needs for <u>communicable disease surveillance</u> inspection being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on communicable disease surveillance? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease in order to increase funding to communicable disease surveillance inspection?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>




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12f) Are community needs for <u>high blood pressure screening</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on high blood pressure screening? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease in order to increase funding to high blood pressure screening?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>

12g) Are community needs for <u>oral health care</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Approximately what portion of your current budget do you spend on oral health care? (Enter 0% if you do not currently offer this activity or service)	_____ %	
If you were able, would you increase, decrease, or maintain this level? (select only one)		
<input type="checkbox"/> Increase 	<input type="checkbox"/> Decrease 	<input type="checkbox"/> Maintain 
What activity or service would you decrease in order to increase funding to oral health care?	On which activity or service would you spend the savings?	<i>Go To Next Question</i>

12h) Are community needs for <u>behavioral risk factor surveillance</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No	
Approximately what portion of your current budget do you spend on behavioral risk factor surveillance? (Enter 0% if you do not currently offer this activity or service)	_____ %

<p>If you were able, would you increase, decrease, or maintain this level? (select only one)</p> <p> <input type="checkbox"/> Increase  <input type="checkbox"/> Decrease  <input type="checkbox"/> Maintain  </p>		
<p>What activity or service would you decrease in order to increase funding to behavioral risk factor surveillance?</p>	<p>On which activity or service would you spend the savings?</p>	<p><i>Go To Next Question</i></p>

<p>12i) Are community needs for <u>ground water inspection</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No</p>		
<p>Approximately what portion of your current budget do you spend on ground water inspection? (Enter 0% if you do not currently offer this activity or service)</p>	<p>_____ %</p>	
<p>If you were able, would you increase, decrease, or maintain this level? (select only one)</p> <p> <input type="checkbox"/> Increase  <input type="checkbox"/> Decrease  <input type="checkbox"/> Maintain  </p>		
<p>What activity or service would you decrease in order to increase funding to ground water inspection?</p>	<p>On which activity or service would you spend the savings?</p>	<p><i>Go To Next Question</i></p>

<p>12j) Are community needs for <u>mental illness prevention</u> being met? (select only one) <input type="checkbox"/> Yes <input type="checkbox"/> No</p>		
<p>Approximately what portion of your current budget do you spend on mental illness prevention? (Enter 0% if you do not currently offer this activity or service)</p>	<p>_____ %</p>	
<p>If you were able, would you increase, decrease, or maintain this level? (select only one)</p> <p> <input type="checkbox"/> Increase  <input type="checkbox"/> Decrease  <input type="checkbox"/> Maintain  </p>		
<p>What activity or service would you decrease in order to increase funding to mental illness prevention?</p>	<p>On which activity or service would you spend the savings?</p>	<p><i>Go To Next Question</i></p>

13. Please list two activities or services not listed in Question 12 for which you would be most willing to decrease current allocations in order to increase allocations elsewhere. (Question 12 asked about adult immunization, lead screening, emergency preparedness, food service establishment inspection, communicable disease surveillance, ground water inspection, and mental illness prevention.)

1.

2.

The final two questions ask about the Centers for Disease Control and Prevention (CDC):

14. Please indicate how confident you are that the CDC	Very confident	Somewhat confident	Not too confident	Not confident at all
a. Understands the needs of local health departments like yours.				
b. Makes decisions based primarily on scientific evidence.				
c. Directs the appropriate level of resources toward the most important public health problems facing the nation.				
d. Makes decisions independent of political pressure.				
e. Has adequate communication plans in place for communicating with local public health departments in an emergency.				
f. Is adequately staffed to respond to a widespread emergency (i.e. an influenza pandemic).				
g. Understands the needs of local health departments serving minority communities.				

15. In your opinion, is the level of emphasis that the CDC gives to each of the following areas too much, too little, or about right?	Too much	Too little	About right
a. Vaccine safety			
b. Disaster preparedness			
c. Gun violence			
d. Global health			
e. HIV/AIDs			
f. TB control			
g. Disease surveillance			
h. Environmental health issues			
i. Social determinants of health			
j. Health behaviors			

**Thank you for completing this survey.
Please return the survey in the postage paid envelope to:**

Susan D. Goold, MD, MHSA, MA, Principal Investigator
University of Michigan
Bioethics Program
300 N. Ingalls, 7C27
Ann Arbor, MI 48109-5429

CHAPTER 3

The Role of Discretion in the Resource Allocation Decisions of Local Public Health Officials

In recent years, public health researchers have emphasized the considerable variation in the way that U.S. public health system is structured. Local public health departments (LHDs) differ in governance structure, jurisdiction, funding structure, services provided and activities offered (Mays and Smith, 2009; NACCHO, 2009; Leviss, 2008). Unfortunately, one thing LHDs share is the burden of meeting the public health needs of their communities with insufficient resources and infrastructure. Funding for public health services is fragmented, and it is difficult for LHDs to ensure core programs (Scutchfield and Keck, 2009; Turnock, 2004; IOM, 2003a). Local public health officials (LHOs) work both to garner adequate resources for public health services, and maximize the use of the resources that are currently in the system.

LHOs are charged with making resource allocation decisions that accord with the needs and priorities of the populations they serve. This task is complicated by the facts that revenues come from many sources and that significant portions of revenues are earmarked for particular programs or services. Some officials complain that they lack the flexibility to allocate funds in order to best serve their communities (Baum et al., 2009). Federal categorical funding is widely criticized as too restrictive in the ways it can be spent. Officials and academics alike suggest that such funding restrictions cause LHDs to tailor their activities and services to federal priorities rather than to local public health needs (Scutchfield and Keck, 2009; Leviss, 2008). In our own recent study of ethical

issues in public health practice in Michigan, some public health officials argued that they did not have adequate discretion in their allocation decision making, and that this lack of discretion hindered their abilities to meet the public health needs in their communities (Baum et al., 2009).

We conducted a national survey of LHOs to examine the nature and scope of their resource allocation decisions. In particular, two goals of this study were to assess the degree of discretion officials report in allocating resources and the factors that influence that discretion, and to explore whether discretion is associated with officials' abilities to ensure that their communities' public health needs are met.

Background

Financing of local public health services. Revenues for local public health services originate from all levels of government as well as from many private sources. The federal government allocates funds to LHDs mainly in the form of block grants, formula grants and categorical programs. Block grants such as the Preventive Health and Health Services block grant or the Maternal and Child Health block grant are generally allocated to states, and states further allocate them to LHDs through a variety of contracts and formulas. Block grants offer states and LHDs the most flexibility to tailor funding to local needs. They are, however, more susceptible to budget reductions because they are not well defined and do not develop supportive constituencies the way more specific programs often do (Leviss, 2008). Formula grants and categorical funding are distributed based on criteria such as disease prevalence and demonstrated population need. This type of federal funding is less fungible than block grant funding, is often restricted to narrowly

defined programs or services, and often contains unfunded mandates that require additional funding from state, local or other sources (Plough, 2004). The federal government also provides a small amount of direct support (e.g., CDC Healthy Communities grant). Payments from Medicare and Medicaid constitute additional federal (and state) funding for LHDs as well.

State direct revenues are one of the largest sources of funds for most LHDs and also vary a great deal from state to state. Most states provide services (e.g., laboratory services) as well as funding to LHDs through contracts and per capita or other formulas that determine need. Local revenues are considered to be the most flexible of public funding sources and are generally raised by city or county governments (e.g., a dedicated public health levy). Other local revenues include fees for certain services, vital statistics and fines (Scutchfield and Keck, 2009; Leviss, 2008; Mays, 2008).

Sources of revenue vary depending on not just the need for services but also whether the LHD is governed at the state or the local level. Those governed at the state level receive higher proportions of revenues from states and from Medicaid than those governed locally. Those governed locally receive more funding from local sources and from federal revenues passed through states. They also receive more from private foundations, private insurance, and patient and regulatory fees. When we compare revenues by the size of the population served by the LHD, there are many fewer significant differences. Those serving populations under 50,000 receive higher proportions of revenues from Medicare and Medicaid and lower proportions from federal direct funds and private foundations.

While the sources of government funding for public health are many, they add up to a very small proportion of overall national health expenditures. Federal, state and local government expenditures for public health activity accounted for less than three percent of our national health expenditures in 2007 (U.S. DHHS, 2009). There have been many efforts over the years to boost government spending on public health activities, but spending on public health activities and services remains low. Only spending earmarked for emergency preparedness has grown substantially in recent years. For now, health departments must consider how to make the most of the current level of public health spending. Examining the level of discretion given to LHOs to make allocation decisions may help to determine whether current resources are being used as effectively as possible. That is, with adequate discretion, LHOs may be able to reallocate current funds in ways that achieve greater community health.

Bureaucratic discretion. Political agency theory traditionally depicts a power relationship between a principal (e.g., a legislator) who has authority and an agenda, and an agent (e.g., an agency bureaucrat) who has specific knowledge and skills. According to this theory, a principal must delegate some authority to an agent to allow the agent to efficiently execute the agenda, but not so much as to risk losing control (Lupia, 2004; Huber and Shipan, 2002; Lipsky, 1980). The notion of bureaucratic discretion is the latitude given to bureaucrats to make decisions, deploy public resources and implement policies based on their expertise, within the confines of particular legislation or rules (Scott, 1997; Bryner, 1987; Lipsky, 1980). The degree of discretion a bureaucrat can use, however, is most often unstated. Instead, they must glean some understanding of the

amount of discretion they have by knowing their constraints (Hambrick and Finkelstein, 1987).

At its best, bureaucratic discretion encourages creativity and allows managers to custom fit programs to community needs. It creates opportunities to make the most of resources. Discretion can also encourage outside participation in problem solving, which can in turn engender trust in an organization or a government (Hall, 1997; Moore, 1995). Laws and rules limit discretion to ensure that certain political or organizational goals are achieved and to ensure that there is some uniformity and neutrality in decision processes. But rules are rigid, and lawmakers cannot always anticipate the complexity of the situation or problem that the rules are designed to solve. At times, rules conflict with other rules, or are contrary to what justice demands. Discretion allows managers to resolve such conflict, and meet the demands of justice (Haque, 2004; Hall, 1997; Schneider, 1992).

Discretion does, however, have significant limitations. It may allow bureaucrats to introduce individual biases into the execution of their duties. As unelected actors in the policy process, they may breach norms of democratic governance if they stray from politically established goals and forge independent approaches to problem solving. Discretion may allow favoritism, or it may introduce imprecision and uncertainty into decision processes (Keiser, 1999; Hall, 1997). According to Vaughn and Otenyo (2007), public trust in government has declined in recent years, in part because of public cynicism about managers applying their discretion unevenly when allocating resources among different sectors of society. The public may see innovation by public managers as dangerous (e.g., self-serving rather than serving the public) even if they expect and praise

such innovation from managers in private industry (Moore, 1995). Some have a particular concern about the role of bureaucratic discretion in allocating resources that are particularly scarce. They worry that bureaucrats may use their discretion “to survive” by, for example, choosing to avoid serving difficult individuals or population groups, thereby denying some the services to which they are entitled (Keiser, 1999, p. 89).

Determinants of discretion. Public administration theory suggests there are at least three important determinants of bureaucratic discretion: characteristics of the organizations in which bureaucrats function; the populations those organizations serve; and individual characteristics of the bureaucrats who run them (Scott, 1997; Kelly, 1994). Using an experimental design, Scott (1997) determined that organizational factors were the most influential in determining levels of bureaucratic discretion, followed by attributes of the population served, with the individual characteristics of the decision makers being the least influential. Other scholars specify that discretion can be determined in part by a manager’s individual ability to see or create opportunities in which to exercise his discretion (e.g., in a political environment) and to envision the action his discretion will allow him to take (Hambrick and Finkelstein, 1987).

Bureaucratic discretion can be created in a variety of ways. Simply the absence of clear directives in legislative language can create some flexibility for public administrators. Leys (1997) contrasts this view of discretion as indefinite legal terminology with a more purposeful freedom to ensure that policies fit what local communities need or want. Legislation creates boundaries within which bureaucrats can function. For example, federal funding structures for state public health services directly affect levels of bureaucratic discretion. Funding through block grants (e.g., the

Preventive Health and Health Services block grant) which no two states use in the same way creates flexible funding structures for clinic and other public health services. Relative to categorical funding streams, block grants offer LHOs more flexibility to operate in ways that are not necessarily directly tied to federal priorities (Mays, 2008). Federal funding is a major source of revenue for all LHDs, especially large metropolitan public health departments. Research by Plough found that the “categorical and restricted nature” of federal funding structures create serious financial management issues for LHDs, which affects “the sustainability and continuity of services” (2004, p. 425). An increase in resource availability, whether through increased revenues or greater sharing of responsibilities with other agencies or community partners, can increase discretion by providing the necessary room in the budget or freeing up staff time (Hambrick and Finkelstein, 1987).

Effects of discretion. The public administration literature begins to link the concept of bureaucratic discretion with the potential to achieve desired outcomes. Research by Sowa and Seldon (2003) shows that administrators who perceive higher levels of discretion are more likely to enact outcomes that favor their particular goals. In an analysis of justice and discretion, Kelly (1994) found that when administrative discretion is high, individual bureaucrats’ conceptions of justice affect the policies that ultimately are implemented. In our own recent study of ethical issues in public health practice, practitioners in one state reported that they did not have adequate discretion in allocation decisions and that this lack of discretion had a negative impact on their abilities to meet the public health needs in their communities (Baum et al, 2009).

Some researchers have explored the relationship between the mix of funding sources for local public health and the performance of LHDs, but there is virtually no research that explores the effect that differing levels of discretion in allocation of that funding may have on health department performance.

Measures of discretion. Despite theoretical and empirical efforts to define it, bureaucratic discretion remains a fairly abstract construct. No one method for measuring discretion has been broadly accepted. In the political science literature, discretion has been measured based on the length and complexity of bills or laws, with the implication that longer, more detailed and complex bills allow less discretion to the bureaucrats who must execute them than shorter, more ambiguous bills (Huber and Shipan, 2002). For certain categorical government programs (e.g., Social Security disability insurance), bureaucratic discretion has been measured via proxy; the greater the proportion of individuals a program covers, the greater the amount of discretion in coverage decisions is assumed to reside with the bureaucrat in charge (Keiser, 1999).

Expert rating systems have also been used to quantify bureaucratic discretion through qualitative assessments. Panels of academic or industry experts have assessed industries and rated the discretion given to managers in those industries. The experts rated various industries as high, medium or low discretion industries based on a variety of criteria. In one such scheme described by Hambrick and Abrahamson (1995), a LHD would be categorized as an industry with low discretion because resources are derived directly from government. Other experts have used Likert-type scales to assign numeric ratings to quantify managerial discretion in different industries. Some have employed content analysis to measure discretion. For example, in business strategy studies,

researchers counted the number of relevant words used in communication with shareholders to determine the level of discretion in industry groups. In one example, researchers counted words that contained the root “regulat,” with higher counts suggesting lower discretion (Hambrick and Abrahamson, 1995).

Sowa and Selden (2003) contend that individual-level measures of perceived discretion are appropriate for assessing the impact of discretion on policy outcomes. They posit that bureaucrats in similar organizational structures bring different values and experiences to their work environments, which allow them to perceive different levels of discretion in their work. In their work they found that both tenure in position and level of education were positively correlated with discretion.

Finally, many scholars view discretion as a complex construct which may be difficult to measure. Hambrick and Finkelstein (1987) suggest that because of such complexity, using multiple measures of discretion in analysis is ideal. They and others emphasize the need for further research to identify and measure factors that determine and influence discretion.

Research questions and conceptual framework

This study examined discretion in allocation decision making by local public health officials in the U.S. We were guided by three specific questions: 1) What level of discretion in allocation decision making do LHOs report? 2) Is there an association between revenue sources and levels of discretion? and, 3) Is there an association between levels of discretion and the ability to meet community needs for public health activities and services?

Based on the literature on bureaucratic discretion, we would expect that LHOs' discretion would be associated with organization-, population- and individual-level factors. Relevant organization-level factors might include: the laws that govern local public health practice at all levels of government; level of oversight by governing bodies, such as boards of health or county commissioners, and any additional constraints they may create; the level of resources available to the LHO, including financial and human resources as well as capacity and supplies (e.g., availability of a dental clinic; availability of vaccines). Population-level factors may include: the level of demand for public health services, determined by the health status of the population; the size of the population; whether the community has access to other providers besides the LHO; and public expectations. Individual-level factors may include: the level of expertise and experience of LHOs in public health practice or related fields; the nature of the working relationship between the LHO and governing bodies (e.g., level of communication and trust the LHO has with their board of health (BOH)); and the LHO's capacity for seeing opportunities to exercise discretion (e.g., level of political acumen or personal creativity). A model predicting discretion would ideally include data from each of these domains, but we are not aware of a dataset that contains relevant data from all of them.

Data and Methods

This study employed data from two recent sources. The first is a national survey of LHOs in the U.S. that we designed and conducted in 2008-2009. The survey asked LHOs about the types of resource allocation decisions they make and what factors influence those decisions. It measured perceived discretion in allocation decision making

in three ways, and asked whether public health needs are met for ten activities and services. The sampling frame was a list, maintained by the National Association of County & City Health Officials (NACCHO), of all LHDs including names and contact information for 2820 LHOs. We stratified our sample by the size of the population served by the LHD, because departments of different sizes are known to have different funding and governance structures and to offer different activities and services to their populations. Stratification by population size enabled us to include the experiences of LHOs from all types of LHDs in our data. We selected n=1327 officials from 121 large, 577 medium and 629 small departments for our survey. The overall response rate for the survey was 53% (n= 685). Survey design and recruiting are described in detail in the previous chapter.

The second data source is the 2008 National Profile of Local Health Departments, a national survey of all LHDs in the U.S., conducted by NACCHO in 2008. The Profile is a periodic effort to collect uniform data about the functioning of LHDs. The 2008 Profile is preceded by four other studies like it since 1989, each intending to collect data on the structure, function and capacity of LHDs. The 2008 Profile includes the only recent source of financial (revenue and expenditure) data, as well as data on jurisdiction and governance structures, activities and services offered by LHDs, workforce, and emergency preparedness activities. Overall, 83% of all LHDs (n=2332) responded to the 2008 Profile. We merged the Profile data with our data using a unique LHD identifier for total merged sample size n=608. Most data items were missing at rates less than 10%. However, Profile data on revenue sources were missing at rates of 15-26%, with data from small and medium LHDs missing at somewhat higher rates than large departments.

No other patterns were identified in the missing data. Analyses were conducted without imputation.

Research questions. We did not identify any research that measured discretion in public health allocation decision making or any published, validated survey questions that would measure discretion in this context. Therefore, we designed the following three survey questions as part of a larger survey about resource allocation, as described in Chapter 2, to measure LHOs' discretion:

- 1) Overall, how much control do you have over the resource allocation decisions in your department? [I have no control; A small amount of control; Moderate control; A great deal of control; Complete control; Unable to rate]
- 2) What proportion of your department's total funds (from all sources) can you reallocate, at your discretion, to better meet the health needs of your community? [0%-100%] and
- 3) What proportion of your department's total personnel time and effort can you reallocate, at your discretion, to better meet the health needs of your community? [0%-100%]

We specified two hypotheses for this study. We expected that 1) higher proportions of local funding would be associated with higher levels of discretion, and 2) higher levels of discretion would be associated with lower levels of unmet need for ten public health activities and services.

We employed four dependent variables in our analyses. Three variables measured LHOs' discretion in resource allocation decision making, based on questions 1-3 above (% of Funds; % of Personnel time; and Overall control), and the fourth was a variable we

constructed for the proportion of public health needs that are met in a community for ten specific activities and services (%Needs Met).

We conducted Pearson's correlations and Spearman's rank tests to determine correlations among the three discretion variables (Kutner, Nachtsheim and Neter, 2004). The purpose of assessing the level of correlation among these three discretion variables was to determine whether to combine them to form one composite measure of discretion (which we would consider if they were highly correlated), and to help establish construct validity; that is, to help determine to what extent we were actually measuring the construct we set out to measure (Trochim, 2001).

The public administration literature on discretion suggests that policy outcomes may depend, in part, on bureaucratic discretion. Therefore, we constructed a fourth dependent variable to assess whether there was an association between levels of discretion and LHOs' abilities to ensure that public health needs are met in their communities (% Needs Met). It was constructed from questions that asked LHOs whether the needs were met in their communities for ten public health activities or services. The variable represents the proportion of "yes" responses to the ten questions. These ten were selected to represent various aspects of local public health, including some clinic services, some regulatory activities and some surveillance activities. They were also chosen to represent some services that nearly all LHDs provide, some that few provide (but may have partners in the community who provide them) and some for which unmet need is generally assumed to be high (e.g., oral health care). The activities and services included: adult immunization; lead screening; emergency preparedness; food service establishment inspection; communicable disease surveillance; high blood pressure

screening; oral health care; behavioral risk factor surveillance; ground water inspection; and mental illness prevention.

Explanatory regression variables were chosen a priori, based on limited evidence in the public health practice literature on LHD performance, and for consistency with the construct of bureaucratic discretion. One explanatory variable of interest was constructed to represent the proportion of LHD revenues arising from local (city and county) sources, to determine whether there was an association between the proportion of revenues from local funds and discretion. As discussed above, our own interviews with public health practitioners have indicated that local revenues may offer more flexibility in allocation, especially in comparison to federal revenues. We also included an indicator variable for the presence of a board of health. While the literature is mixed on the role of boards of health in improving the performance of public health departments, some studies have indicated that “policy-making” boards of health positively affect LHD performance (Bhandari, et al., 2008; Mays, et al., 2006; Scutchfield et al., 2004). We included a continuous variable for the size of the population served because there is some evidence that larger health departments also positively affect performance (Savoia, et al., 2009; Bhandari, et al., 2008; Mays et al., 2006;). We also included an indicator variable for the governance structure of the LHD (e.g., whether the department is governed locally or at the state level) because the locus of control may have an important impact on determining LHOs’ discretion. The governance variable was constructed by NACCHO, based on a Profile question asking which body had the authority to hire/fire the LHO.⁶ For similar

⁶ The question asked LHOs to choose all categories that applied among: local board of health, county government, city/town government, state health agency or other. When it was unclear whether the authority rested at the state or local level, NACCHO contacted Profile respondents directly to ensure appropriate classification.

reasons we included an indicator variable for whether the BOH had the authority to approve the LHD's budget.

In addition, we constructed a variable for per capita expenditures. A recent study showed that per capita expenditures on public health in the U.S. vary among LHDs by a factor of 13, due in part to differences in the services and activities provided (Mays and Smith, 2009). The per capita expenditures variable in our dataset had an extremely wide range of values, from less than one dollar to \$13,000. Based on the recent evidence on variation, and because the median expenditure in our data was \$36.10, we decided to exclude values greater than \$500 from these analyses.⁷

As discussed above, the discretion literature suggests that in addition to organization-level factors, population- and individual-level factors may also be important in determining bureaucratic discretion. We included race variables (separate, continuous variables for the proportion of each racial group in the population) largely because these were the only population-level variables available in this merged dataset, besides the size of the population. A large body of literature has established complex relationships between race and social factors, and the resultant effects on health status (IOM, 2003b). It may be that the racial make-up of the population affects the types of services and activities the LHD offers, which would be associated with variation in revenue streams as well. The coefficients on population race variables are particularly difficult to interpret because the relationship between race and discretion seems far removed. We included race largely because it was the only population-level variable our dataset included besides

⁷ A common standard for determining outliers is 1.5 x interquartile range (Moore and McCabe, 2003). In the case of high variation in per capita spending this standard would exclude a large proportion of observations. We decided to exclude only four particularly high observations, ranging from \$857-\$13,000.

the size of the population, yet it is not clear just how population race may be associated with various levels of discretion.

We included the number of years of experience the LHO had in her position, gender, and the education level of the LHO as individual-level factors that may affect discretion. Each of these may play a role in determining whether LHOs are seen as capable, trustworthy experts in the eyes of boards of health, county commissioners, and members of the public, all of whom may influence LHOs' levels of discretion. [See Table 3.2 for descriptive statistics of the variables used in the analyses.]

We also used the three measures of discretion as explanatory variables in bivariate regressions to determine whether there is an association between a LHO's discretion and % Needs Met, the proportion of public health needs that are met in the community for ten specific activities and services. In addition, we estimated levels of discretion by each of the public health activities, and compared the means of two groups (those reporting that needs are met vs. needs are not met) using Student's t-tests (Moore and McCabe, 2003).

We constructed survey weights for unequal probability of selection into the sample, differences in response rates, and stratification so that our sample would be consistent with the overall population of LHOs in the U.S. (Lee and Forthofer, 2006). Multivariate analyses using ordinary least squares regression for continuous variables⁸ on cross-sectional data estimated the models for two of the discretion variables (%Funds and %Personnel). The ordinal discretion variable for Overall control was estimated using

⁸ The current analyses treat the three dependent variables measured as proportions (the proportion of funds the LHO can reallocate, the proportion of personnel time the LHO can reallocate, and the proportion of times the LHO responded "yes" to a series of questions asking whether community health needs are met for ten activities and services) as continuous variables, despite the fact that they are bounded at 0 and 100. Since all three variables have fairly full distributions, we decided that exploratory analyses should be conducted in OLS because OLS estimates are more stable in the face of non-normal residuals or heteroscedasticity than tobit estimates. Future analyses will employ tobit or other generalized linear models to attempt to improve model estimations.

ordered logistic regression. We used a log transformation on the two continuous variables for discretion to improve normality and linearity. Reduced models were also tested to determine whether models with fewer variables would improve the model fit. All analyses were conducted with STATA 10 software, using the `svy:` command to correct for sampling design.

The report of the 2008 Profile data emphasized that revenue and expenditure data must be interpreted with caution because of higher levels of missing data, but also because they were aware that some LHDs had difficulty conveying the level of detail requested by the survey. NACCHO anticipated this difficulty and included a question in the Profile asking whether the LHD's financial system allowed respondents to distinguish between two types of revenues (those that originated at the state level and those that originated at the federal level and were passed through states), and to report on them accurately. As a sensitivity analysis we estimated models both on the full dataset (n=608) and on a subset of the data that included only those who responded that they could make the distinction (or could make reasonably accurate estimates) between state and federal pass-through funds (n=476).

The University of Michigan Medical School's Institutional Review Board approved the study.

Results

Demographic characteristics of local health officials and their departments can be found in Tables 2.1 and 2.2 in the previous chapter.

The three discretion variables were moderately correlated with one another (Pearson correlation for the correlation between % Funds and % Personnel time = .62. Spearman rank for % Funds and Overall control = .46, and for the % Personnel time and Overall control = .35).

Discretion by size of population and by governance category. Local health officials reported that they can reallocate, on average, 32% of their department's total funds at their discretion to better meet the health needs of their communities.⁹ They also reported that they can reallocate, on average, 48% of their total personnel time and effort at their discretion. Sixty-five percent reported that they had a "great deal" or "complete" control in allocation decisions.

Bivariate OLS regression indicated that there were no significant differences among the three measures of discretion by population size category. There were, however, significant differences in levels of discretion between state and local governance structures. Officials in locally governed departments reported that they can reallocate ten percentage points more of their funds and 14 percentage points more of their personnel time and effort than those governed at the state level. Bivariate ordered logistic regression analysis of the ordinal variable Overall control yielded a proportional odds ratio of 4.55, meaning that for those locally governed, the odds of complete control versus the combination of all other categories of control are 4.55 times greater.¹⁰ [See Table 3.1 for discretion variables by size and governance category.]

⁹ Thirty-six LHOs (six percent of all respondents) reported that they could reallocate 100% of their funds at their discretion. We did not identify any consistent patterns in this group; they were from all three size categories, both governance categories and from a variety of states.

¹⁰ Because of the proportional odds assumption in ordered logistic regression, the same increase of 4.55 times is found between any one category of overall control and the combination of all other categories (UCLA Academic technology services).

Multivariable models. Table 3.2 displays summary statistics for the variables used in regression models. Table 3.3 displays the results from the full multivariable OLS regression models for both the proportion of total funds LHOs can reallocate, and for the proportion of personnel time and effort they can reallocate at their discretion. It also includes estimates from a subset of the data “restricted” only to observations where the respondent replied that their financial system allowed them to distinguish between funds that originated from the state vs. from a federal source, or that they could make a reasonably good estimate of the distinction (476/570 observations remained in the restricted set).

In general, the models explain little of the variation in the discretion variables, and standard errors are large for most model coefficients. To assess levels of multicollinearity in the models, we regressed each predictor variable on all other predictor variables in each model to determine how much of each variable’s effect is independent of the other variables. In all models, only the interaction term showed a low amount of independent variation (about 5%).

Both models (as well as their restricted versions) indicate that the presence of a BOH may have a moderating effect on the relationship between per capita expenditures and discretion. In the models estimating % Funds, when there is no BOH, a one dollar increase in per capita expenditures would be associated with a reduction of 0.4%¹¹ of the % Funds that officials could reallocate, holding all other variables constant. However, in the presence of a BOH, the same increase of one dollar in per capita expenditures would

¹¹ Since the dependent variables % Funds and %Personnel time have been log-transformed and the predictors have not, the interpretation of the coefficients is that the dependent variable changes by approximately 100*(coefficient) percent for a one unit increase in the independent variable, holding all other variables constant (UCLA Academic technology services).

have almost no effect on the proportion of funds that could be reallocated. The model estimating % Personnel time shows similar moderating effects. Few other predictor variables in the models are significant. The variable for gender of the LHO is significant in the model predicting %Personnel time, and indicates that female LHOs are associated with a 19% increase (21% in the restricted model) in discretion. The size of the population may have a small, negative effect on %Personnel time as well. The coefficients on the LHO education variables appear to have a generally decreasing relationship with discretion but most are not significant; two coefficients are significant in the two restricted models. Many of the signs on the education coefficients switched when we estimated the restricted model of proportion of funds.

The coefficient for the variable % Local revenues (our predictor variable of interest for our hypothesis) was negative in three of the four models, and was not significant in any model. None of the population race variables, the governance variable, nor the variable for LHO experience were significant in any of the OLS models. The model F statistic was marginally significant for the model for %Funds (but not for the restricted version) and the $R^2 = .055$ on 508 observations (412 for the restricted model). The model F statistic for the %Personnel time was significant (also for the restricted model) and the $R^2 = .09$ (.11 for the restricted version) on 520 observations (421 in the restricted model).

Table 3.4 displays the results from the ordered logistic model estimation. While the model F test is significant, few of the odds ratios are statistically significant. Only the governance variable has a strong significant odds ratio. The model suggests that the odds of complete control versus the combination of all other categories of control are 4.39

times greater for those locally governed than those governed by the state. A similar, somewhat smaller effect is shown in the restricted ordered logit model. The coefficient on size is marginally significant, but the odds ratio is very nearly one. There appears to be an upward, positive trend in the education variables in this model, but only one coefficient is marginally significant. The coefficient on one race group, Native Hawaiian/Pacific Islander, is significant, meaning that the odds of complete control versus the combination of all other control categories are 2.39 times greater for Native Hawaiian/Pacific Islander as compared to the “Other” race group (which has been excluded from the model to avoid perfect collinearity). The odds ratio for this race category are higher (5.32) in the restricted ordered logit model. The odds ratios are positive but not significant for the proportion of local funds in both the ologit and the restricted ologit models.

Proportion of needs met for ten activities and services. On average, LHOs responded that the needs in their communities were met for six of ten public health activities and services we specified in our survey. Officials from large departments reported significantly lower proportions of Needs Met than those from medium and small departments. Sixty-five percent reported that needs were met for adult immunization, yet those running large departments were significantly much more likely to report unmet need. The need for lead screening was also met in 65% of communities, with locally governed communities reporting a lower level of unmet need than those governed at the state level. The vast majority of officials reported that the needs for food inspection and water inspection were met (84% and 80% respectively), and the need for emergency preparedness was reported to be met by 68% of officials. Disease surveillance and blood

pressure screening differed significantly for all three size categories, with unmet need increasing as the size of the departments increased.

Departments governed at the state level also reported greater unmet need for blood pressure screening than those governed locally. Less than one quarter of all officials reported that the oral health needs in their community were met, but those from smaller departments reported that oral health needs were met more than from larger departments. Forty-six percent of officials reported the need for behavioral risk surveillance was met, but only 23% said the need for mental health services in their communities was satisfied. Again, as the size of the department increased, the unmet need for mental health services increased. [See Table 3.5.]

For nine of the ten activities and services, the mean of %Funds that can be reallocated is higher for LHOs in departments who reported that their needs were met, compared to those whose needs are not met, and four of the differences in means are significant at $p \leq .05$. [See Table 3.6.] All ten means are higher for the needs met group when we assess the mean %Personnel time that can be reallocated. [See Table 3.7.] Student's t-tests indicate significant differences in means between the two groups (needs met vs. needs not met) for six of the activities and services. In bivariate OLS regressions, both the %Funds and %Personnel time had small, positive and significant coefficients indicating associations with the aggregate variable %Needs Met. The Overall control variable also had a small, positive significant association with %Needs Met, but only for the level of "complete control" as compared to the reference category of "I have no control." [See Table 3.8.]

Discussion

In this study we measured bureaucratic discretion in the context of local public health practice in three ways: by the proportion of total funds LHOs can reallocate; by the proportion of personnel time and effort LHOs can reallocate; and by the overall level of control they report in allocation decision making. While discretion is a complex construct, by collecting data using three separate but related survey questions we can triangulate findings to begin to build a clearer understanding of LHOs' flexibility and control in allocation decisions.

LHOs reported that they could reallocate, at their discretion, about one third of all the revenues that support their LHDs. Is this enough flexibility and control to accomplish the essential services of public health practice? Of the many revenue sources that finance public health practice, no one source, on average, accounts for a full third of total revenues, indicating that discretion is likely determined by more factors than just funding sources. This is consistent with public administration theory, which suggests that discretion is likely a function of organizational-, population- and individual-level factors. We hypothesized that discretion would be associated with an increase in the proportion of funding from local sources, based on interview data with LHOs that indicated that local funds carried few restrictions, as well as the conventional wisdom that federal funds are narrowly constrained to federal priorities. The regression models in this study, however, do not support our hypothesis. While we did not find significant and positive coefficients on our variables for the proportion of local revenues in regression analyses, we did report two related findings. First, as we reported in the previous chapter, locally governed LHDs receive a larger proportion of their total revenues from local sources. Second,

LHOs managing locally governed LHDs report significantly higher levels of discretion than those governed at the state level. These co-occurrences suggest that further research focused on the relationship between discretion and local funding could be fruitful.

Beyond managing financial resources, LHOs report the ability to reallocate nearly half of their personnel time and effort. Clearly, this flexibility is dependent in large part on the skills, licensure and abilities of public health practitioners to work in a variety of areas. For example, if a community had a greater need for specialized disease clinics than for maternal and child services, registered nurses may be able to move fairly easily between these different areas of practice. If, however, there was great demand for environmental services, the skills of nurses and sanitarians are not so interchangeable. Even if funding structures allow certain redistribution of effort, practitioner-level limitations may preclude it. Given that public health practice is labor intensive, discretion over nearly half of all personnel time and effort seems substantial. It is likely that respondents also considered smaller scale redirection of tasks than those discussed here when answering this question.

Multivariable and bivariate analyses of both %Funds and %Personnel indicating few significant associations between individual LHO-level variables (e.g., experience, education and gender), are consistent with Scott's (1997) work indicating that organization-level factors are more important in predicting discretion than individual-level factors. These analyses do indicate, however, the presence of an interesting association between per capita expenditures and discretion that is moderated by the presence or absence of a BOH. Without a BOH, higher per capita expenditures are

associated with lower discretion. This may be attributable in part to the public health financing structure; that is, LHDs draw revenues from the funding sources that are available to them, not necessarily from sources that are directly tailored to the public health needs of their communities. So, if per capita expenditures increase due to more federal funding that is earmarked for specific activities and services, LHOs may have little discretion about how to allocate such funds. In contrast, the presence of a BOH, especially one that may be highly policy oriented and proactive about ensuring adequate and appropriate funding for specific community needs, may influence the balance of revenue (and therefore the level of per capita expenditures) in ways that diminish the need to seek extra funding. While we did not calculate the specific marginal effect of the interaction term (BOH x per capita expenditures) in our analyses, the coefficient on the interaction term is positive and larger than the negative coefficient on per capita expenditures. Further analyses of this data will include a calculation of the marginal effect of the interaction to better specify the magnitude of the moderating effect.

Analyses of the third measure of discretion, Overall control, yielded quite different findings. The multivariable analyses suggest a positive association between governance structure and control of allocation decisions – in other words, locally governed departments are associated with higher levels of LHO discretion. While this may be an obvious finding, it does indicate that respondents likely interpreted this question much more broadly, and quite differently than those measuring %Funds and %Personnel, capturing a different aspect of the construct of discretion. Our three measures of discretion are moderately highly positively correlated, but clearly each

conveys a somewhat different perspective on what it means for LHOs to have discretion in allocation

Despite the differences among the three measures of discretion, all may be related to officials' abilities to ensure that public health needs in their communities are addressed. As we hypothesized and as Student's t-tests and bivariate regressions indicate (i.e. analyses that do not control for any of the myriad factors associated with the ability to meet needs, such as demand for services and availability of community partners), all three measures of discretion are positively and significantly associated with our variable for %Needs Met. If, in more nuanced analyses, higher discretion is further associated with the capacity to satisfy community needs, it may be important to gain an understanding for exactly what LHOs with more discretion do differently. In other words, how is increased discretion operationalized in public health practice? This finding may provide an additional salient factor in discussions about whether to encourage more centrally organized and executed public health activities and services. A small but growing body of literature is beginning to build evidence that larger, more centralized LHDs may be doing a better job of executing the ten essential public health services (Bhandari, et al., 2008; Mays et al., 2006; Scutchfield et al., 2004), yet we see evidence that LHOs in small, decentralized LHDs have more discretion. It will be important to ask precisely what is expected to be gained and lost by increasing centralization of these organizations. Our finding may provide justification for further study of the role of discretion by local officials in meeting community public health needs.

In her 2004 commentary titled, "There will never be enough money!" a local health official called categorical funding for public health a "system disability." She

emphasized that “...implementation that is dependent on categorical funding cannot be easily or effectively shaped to meet the needs of the people we serve,” and implored public health practitioners to think creatively about how to spend the money in the public health system (Bailey, 2004, p.433). Our measures of discretion may include a latent concept of creativity: the ability of a LHO to identify areas where changes in the ways resources are used may bring improvements to the system. Some discretion scholars suggest that experimentation and stretching the limits can distinguish a successful from unsuccessful leader in an organization (Vaughn & Otenyo, 2007). Rather than simply focus efforts on increasing the resources that go into the public health system, the findings in this study indicate that it may also be useful to assess creative and flexible reallocation schemes. The LHOs who motivated this study argued that discretion could provide a “no cost” method for making improvements in public health practice.

Limitations and next steps

A central limitation in this and other studies using the 2008 Profile data is the concern for the quality of the revenue and expenditure data we employed. We believe these data are central to understanding the construct of discretion in public health practice. The Profile data are the best available and are rigorously compiled by an organization with the greatest knowledge about public health practice, but there are serious limitations in the capacities of LHDs to provide the data researchers need. We did conduct our multivariate analyses on a subgroup of the data that was expected to be reasonably accurate and gained similar results to our analyses on the full dataset. Future

analyses will employ additional statistical methods (e.g., other forms of regression analyses) to try to improve the fit of our models to this data.

Another limitation is that while over 80% of LHDs completed the NACCHO Profile survey, our resource allocation survey had a lower response rate of 53%. Non-respondents to our survey may differ from survey respondents in ways that are important to our study, such as their perceptions of the amount of discretion they have in their work. Our study design did not include a follow-up non-response survey, which would have given us an opportunity to determine whether there was such non-response bias on our measures of discretion. We did, however, weight our data to adjust for differences in selection probability, response rates among the three size strata, and a post-stratification weight to ensure that our survey data was representative of our target population of all LHOs. Thus, our findings can be generalized to the population of LHOs in the U.S.

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Table 3.1: Discretion Variables by Size of the Population and Governance Structure

	<u>Total</u>	<u>Small</u> (<u><50,000</u>)	<u>Medium</u> (<u>50,000-</u> <u>499,000</u>)	<u>Large</u> (<u>≥500,000</u>)	<u>Local Gov</u>	<u>State Gov</u>
% Funds	31.83 (1.37)	32.53 (1.94)	30.12 (1.51)	32.87 (3.77)	33.40*** (1.56)	23.14 (2.12)
% Personnel	47.67 (1.66)	49.46 (2.33)	43.97 (1.96)	45.22 (4.61)	49.86*** (1.83)	35.47 (3.41)
Overall control					OR 4.55***	
No control	.02	.013	.004	.002	.015	.003
Small control	.11	.082	.022	.006	.066	.044
Mod control	.22	.137	.076	.008	.162	.059
Great deal	.53	.338	.168	.024	.485	.044
Complete control	.12	.095	.022	.004	.115	.006

Figures for % Funds and % Personnel are means (s.e.).

Figures for Overall control are proportions.

The odds ratio was estimated using bivariate ordered logistic regression.

***Statistically significant at the .1 percent level

Table 3.2: Variables Included in Regression Models

Dependent Variables	Obs.	Mean or proportion	s.e.	Range
% Funds	592	32.07	1.38	0-100
% Personnel time	595	48.01	1.67	0-100
Overall control	591			1-5
1= No control		.02		
2= Sml amt control		.11		
3= Mod amt control		.22		
4= Great deal control		.53		
5= Complete control		.12		
% Needs Met	598	.60	.01	0-1
Independent Variables				
% Local (county/city)	444	.25	.01	0-1
Per capita expenditures	561	52.10	2.46	.98-333.91
Years in position	604	10.07	.35	1-44
% pop White	608	86.21	.68	1.03-99.42
% pop Afr. Am.	608	6.61	.56	0-98.02
% pop Am Ind/Alaskan	608	1.38	.29	0-77.22
% pop Asian	608	1.56	.12	0-34.57
% pop Haw./Other PI	608	.05	.004	0-1.05
% LHD pop Other	608	2.57	.22	0-50
Board approves LHD budget 1=yes	605	.48	.02	0-1
LHO gender, 1=female	608	.57	.02	0-1
Governance, 1=local state=0	608	.85	.02	0-1
Board of Health 1=yes	608	.75	.02	0-1
LHO Education	608			
0=none		.07	.01	0-1
1=Associates degree		.04	.01	0-1
2=Bachelors degree		.34	.02	0-1
3=Masters degree		.40	.02	0-1
4=Doctoral degree		.15	.01	0-1
Interaction terms				
BOH x Per Capita Expend.	561	36.36	2.12	0-333.91

Table 3.3: OLS Estimates of Two Discretion Variables: Log (Proportion of Funds) and Log (Proportion of Personnel Time) Officials can Reallocate

	Ln % Funds		Ln % Personnel time	
	n=508 R ² =.06 Model F =.061	(restricted) n=412 R ² =.06 Model F =.055	n=520 R ² =.09 Model F =.000	(restricted) n=421 R ² =.11 Model F =.000
% Local revenues	-.025 (.110)	-.112 (.127)	-.077 (.112)	-.005 (.130)
Governance (1=local, 0=state)	.109 (.150)	.055 (.174)	.010 (.161)	-.016 (.181)
Board of health (1= has a BOH)	-.121 (.172)	-.289 (.199)	-.195 (.211)	-.571** (.214)
Per capita expenditures	-.004* (.002)	-.003 (.002)	-.006** (.002)	-.008** (.003)
BOH* Per Capita expenditures	.005* (.002)	.005+ (.003)	.008** (.002)	.011*** (.003)
Size of population	-9.60e-08 (8.31e-08)	-6.37e-07 (7.38e-08)	-1.46e-07+ (8.78e-08)	-1.47e-07 (8.99e-08)
% of pop White	-.007 (.009)	-.003 (.011)	-.010 (.011)	-.008 (.013)
% of pop Afr Am.	-.005 (.009)	-.0003 (.011)	-.012 (.011)	-.011 (.014)
% of pop Am. Indian/Al. Native	-.009 (.012)	-.006 (.014)	-.018 (.013)	-.016 (.016)
% of pop Asian	-.013 (.016)	-.010 (.019)	.001 (.017)	.001 (.018)
% of pop Haw/PI	.310 (.478)	.429 (.496)	.364 (.552)	.533 (.582)
BOH authority to approve LHD budget 1=yes	.077 (.104)	.130 (.118)	.113 (.111)	.190 (.115)
Years in position	.002 (.006)	-.002 (.006)	-.001 (.006)	-.003 (.006)
LHO gender 1=female	.172+ (.097)	.149 (.108)	.192* (.096)	.208+ (.107)
LHO education (excluded = no degree)				
Associates deg.	.170 (.399)	-.133 (.349)	.115 (.256)	.032 (.270)
Bachelors deg.	.126 (.358)	-.351 (.278)	-.092 (.202)	-.247 (.193)
Masters deg.	-.070 (.364)	-.604* (.277)	-.311 (.203)	-.496* (.195)
Doctoral deg.	.026 (.382)	-.484 (.297)	-.322 (.228)	-.521* (.225)
Constant	3.47 (.935)	3.939 (1.153)	4.546 (1.056)	4.742 (1.301)

+Statistically significant at the 10 percent level. * Statistically significant at the 5 percent level.
 ** Statistically significant at the 1 percent level. ***Statistically significant at the .1 percent level.

Notes: 1) When the dependent variables are log-transformed, the interpretation is that dependent variable changes by approximately 100*(coefficient) percent for a one unit increase in the independent variable, holding all other variables constant (UCLA Academic technology services).
 2) The “restricted” models use only observations where the respondent replied that their financial system allowed them to distinguish between funds that originated from the state vs. from a federal source.
 3) We omitted the “other” race category to avoid perfect collinearity.

Table 3.4: Ordered Logistic Regression Estimates (Odds Ratios) of LHOs' Overall Control in Allocation Decision Making

	Odds Ratios (s.e.)	
	n=539 Model F=.000	(restricted) n=430 Model F=.004
% Local revenues	1.456 (.344)	1.408 (.392)
Governance (1=local, 0=state)	4.395*** (1.225)	3.036** (.964)
Board of health (1= has a BOH)	.811 (.305)	.744 (.330)
Per capita expenditures	1.004 (.004)	1.003 (.004)
BOH* Per capita expenditures	1.000 (.005)	1.000 (.005)
Size of population	1.00+ (1.49e-07)	1.000* (1.50e-07)
% of pop White	1.001 (.021)	1.007 (.027)
% of pop Afr Am.	.995 (.022)	.995 (.027)
% of pop Am.In./Ak. Native	1.019 (.021)	1.012 (.028)
% of pop Asian	1.00 (.037)	1.013 (.050)
% of pop Haw/PI	8.38* (7.49)	5.325+ (4.562)
BOH authority to approve LHD budget 1=yes	1.339 (.319)	1.122 (.305)
LHO Years in position	1.008 (.012)	1.019 (.014)
LHO gender 1=female	.874 (.182)	.916 (.217)
LHO Education excluded = no degree		
Associates deg.	1.812 (1.072)	1.362 (1.070)
Bachelors deg.	1.984 (.996)	1.235 (.858)
Masters deg.	2.388+ (1.184)	1.116 (.771)
Doctoral deg.	2.338 (1.320)	.879 (.005)

+Statistically significant at the 10 percent level.
 * Statistically significant at the 5 percent level.
 ** Statistically significant at the 1 percent level.
 *** Statistically significant at the .1 percent level

Note: 1) Categories of overall control are 1=I have no control, 2=A small amount of control, 3=Moderate control, 4=A great deal of control, 5=Complete control
 2) The “restricted” model uses only observations where the respondent replied that their financial system allowed them to distinguish between funds that originated from the state vs. from a federal source.

Table 3.5

Proportion of Needs Met for Selected Public Health Services and Activities

	<u>Total</u> (n=608)	<u>Small</u> (n=258)	<u>Medium</u> (n=292)	<u>Large</u> (n=58)	<u>Local Gov</u> (n=517)	<u>State Gov</u> (n=91)
Overall proportion for all services	.60	.62	.57	.48**^{S M}	.60	.60
Adult immunization	.64	.67	.62	.36** ^{S M}	.66	.56
Lead screening	.65	.66	.62	.72	.62	.80**
Emergency preparedness	.68	.70	.64	.58	.66	.76
Food establish inspection	.84	.84	.85	.72	.83	.87
Disease surveillance	.84	.88** ^{M L}	.79** ^{S* L}	.65	.84	.87
Blood pressure screening	.65	.72*** ^{M L}	.55** ^{S** L}	.29	.68	.49**
Oral health	.23	.26** ^M	.16	.14	.24	.19
Behav. Risk surveillance	.46	.46	.46	.42	.44	.58*
Water inspection	.80	.80	.80	.76	.80	.82
Mental health prevention	.23	.26** ^{M L}	.16** ^{S* L}	.05	.24	.16

Figures represent proportions.

* Statistically significant at the 5 percent level.

** Statistically significant at the 1 percent level.

*** Statistically significant at the .1 percent level.

^{S, M, L} Significantly different from the estimate for small, medium, or large strata respectively.

Table 3.6: Is Discretion in Funds Allocation Associated with Meeting Community Public Health Needs?

	<u>Mean % of funds that can be reallocated</u>		Difference in Means (s.e.)
	Needs Met	Needs Not Met	
Adult immunization	33.28	30.21	3.07 (2.74)
Lead screening	32.73	31.69	1.03 (2.79)
Emergency preparedness	34.30	27.13	7.17 (2.64)**
Food establish inspection	31.60	33.57	-1.97 (3.79)
Disease surveillance	33.39	27.74	5.64 (3.09)+
Blood pressure screening	34.92	27.71	7.21 (2.76)**
Oral health	38.64	30.07	8.58 (3.77)*
Behav. risk surveillance	33.50	30.58	2.92 (2.87)
Water inspection	33.76	26.76	7.00 (3.20)*
Mental health prevention	38.51	31.04	7.47 (3.97)+

Student's t-tests compare means for Needs Met and Needs Not Met

+ Statistically significant at the 10 percent level

*** Statistically significant at the 5 percent level.**

**** Statistically significant at the 1 percent level.**

Table 3.7: Is Discretion in Personnel Time Associated with Meeting Community Public Health Needs?

	<u>Mean % of personnel time that can be reallocated</u>		
	Needs Met	Needs Not Met	Difference in Means (s.e.)
Adult immunization	47.78	45.29	2.49 (2.99)
Lead screening	48.26	44.68	3.58 (3.04)
Emergency preparedness	48.98	43.45	5.53 (3.08)+
Food establish inspection	47.39	45.58	1.81 (3.94)
Disease surveillance	49.00	37.90	11.10 (3.82)**
Blood pressure screening	51.61	40.91	10.71 (3.02)***
Oral health	53.86	45.14	8.72 (3.66)*
Behav. risk surveillance	47.76	44.98	2.78 (3.01)
Water inspection	48.31	43.00	5.30 (3.81)
Mental health prevention	51.24	46.28	4.95 (3.84)

Students t-tests comparing means for Needs Met and Needs Not Met

+ Statistically significant at the 10 percent level.

*** Statistically significant at the 5 percent level.**

**** Statistically significant at the 1 percent level.**

***** Statistically significant at the .1 percent level.**

Table 3.8: Bivariate OLS Estimates of the Proportion of Needs Met

	n	Coefficient (s.e.)	R²
Log % Funds	552	.028* (.011)	.02
Log % Personnel time	569	.041** (.011)	.03
Overall control (excluded category = no control)	587		.03
Sml amount of control		.059 (.084)	
Moderate control		.046 (.078)	
Great deal of control		.08 (.077)	
Complete control		.166* (.08)	

* Statistically significant at the 5 percent level.

** Statistically significant at the 1 percent level.

CHAPTER 4

Ethical Issues in Pandemic Preparedness and Response: Focus Groups for Public Engagement

It is widely recognized that during a pandemic involving a highly virulent strain of influenza, demand for health care services will overwhelm existing health care systems. Surges of patients will create demand for resources (e.g., antiviral medications, antibiotics and ventilators) beyond the capacity of most health care systems, necessitating difficult decisions about fair and equitable allocation of scarce resources. Social distancing measures, such as home quarantine and school and business closures, will also likely be implemented during a pandemic to contain contagion. These measures may limit personal freedoms and create serious ethical challenges for institutions and larger communities (Gostin, 2006; Schuklenk and Gartland, 2006; Thompson et al., 2006; Zhang, et al., 2006; Kotalik, 2005). A coordinated and effective response to an influenza pandemic will require educated and trained health care professionals, well considered and clearly established health system protocols, as well as an informed populace. Public engagement in difficult, ethically laden pandemic planning decisions may be an important factor in creating transparent processes, public trust in health care systems, voluntary compliance with public health orders, and ultimately, just outcomes. The literature on pandemic planning and response recognizes the need to engage the public in the planning process in order for policy makers to make ethically tenable decisions (Kass, N. et al., 2008; Keystone Center, 2007; Lemon et al., 2007; Thomas, 2007; DeCoster, 2006; Keystone Center, 2005; Kotalik, 2005; University of Toronto Joint Centre for

Bioethics, 2005). Yet despite this awareness in the literature, there have been limited opportunities to date for public participation in policy making related to pandemic preparedness.

This study convened members of the public, in four focus group sessions, to consider and discuss two elements of pandemic planning and response: 1) issues of justice or fairness in the allocation of resources expected to be scarce during a pandemic; and 2) balancing individual liberties with public health interests in the implementation of social distancing measures to contain contagion during an influenza pandemic. We aimed to gain a broad understanding of diverse points of view on challenging ethical questions for public health practitioners. What criteria for deciding among population groups would community members see as legitimate, and which ethical principle should guide decision making? How onerous will social distancing measures be for members of the community? Will they see proposed interventions as valuable and will they be public-minded in their responses?

We contribute to the literature on pandemic preparedness by adding citizens' perspectives on the expected impact of social distancing measures and scarce resource allocation. In addition, we add to the limited literature on the value of public deliberation about ethical issues in public health practice.

Background

In recent years, agencies at all levels of government as well as private organizations have been developing pandemic response plans. Major international planning efforts have also been underway by the World Health Organization and other

groups to improve surveillance infrastructure and response efforts around the world. In the U.S., the Department of Homeland Security (DHS) is responsible for the overall national response strategy (U.S. DHS, 2006), while the Department of Health and Human Services (DHHS) is responsible for developing and updating the federal-level response plan (U.S. DHHS, 2005(a)). States have all developed pandemic response plans as well. Both Federal and State plans are intended to clarify when and how resources will be used in a pandemic, and they offer broad guidance to local health officials largely responsible for executing the elements of response plans. Embedded in these broad guidelines are provisions that create ethical challenges for local officials, as they must decide among individuals/population groups for the receipt of scarce resources, and must institute trade-offs between public health goods and individual interests to contain contagion.

Allocation of scarce resources. Numerous pharmaceutical and non-pharmaceutical products are expected to be in short supply during a severe influenza pandemic. Local health care systems and public health departments will likely be unable to meet the demand for antiviral medications, antibiotics, vaccines, ventilators and respirators, among other products. While the federal Strategic National Stockpile (U.S. DHHS(d), CDC) is designed to quickly deliver some products to states and local areas when shortages occur, the Stockpile is not expected to meet the surge in demand immediately, and difficult allocation decisions will need to be made about which groups should receive priority for scarce supplies. The current DHHS pandemic plan includes a prioritization scheme for the allocation of influenza vaccine, designed to guide local health officials and others who administer vaccine in the case of a shortage (U.S. DHHS, 2005(a)). While the federal vaccine allocation scheme does identify specific

occupational and population categories and sets priorities among them, local health officials will nonetheless be left to make difficult decisions about which individuals in their communities qualify for each category. The federal pandemic plan includes guidelines for the use of some other products expected to be scarce (e.g., antiviral medications), but does not detail priority groups as it does for vaccine allocation. Individual health systems, as well as local and state governments in the U.S., are working to design protocols for allocating other scarce products.

A fair and just distribution of the benefits and burdens of public health resources is the broad goal of public health priority setting. Various conceptions of justice and fairness are discussed in the literature, yet no one theory consistently guides priority setting procedures in public health (Daniels, 2001 and 1981). Even the oft repeated principles associated with public health policy and practice -- utilitarianism and social justice (Gostin and Powers, 2006; Turnock, 2004; Levy, 1998; Krieger and Brin, 1998) – are not consistently used to guide allocation decisions, due in part to a wide variety of values underlying public health practitioners’ decision making (Baum et al., 2009). A utilitarian approach to allocation (e.g., using cost-effectiveness analyses) would strive to maximize net benefits to the population under consideration. Such approaches put relatively little emphasis on the actual distribution of benefits, and therefore would not single out particular groups to receive scarce public health services or products. Gostin and Powers (2006) suggest that social justice in public health means striving for a fair distribution of benefits and burdens, focusing efforts on disadvantaged sectors of a community. An allocation approach that aimed to improve social justice might provide public health services first to those deemed to have the greatest need (Brock, 2002).

Distinct from utilitarian and social justice approaches, an egalitarian approach might strive to provide the same level of resources across all population groups. Without an agreed upon conception of justice, it is difficult for policy makers or local public health officials to know when they are making ethically challenging decisions effectively.

Social distancing measures. In the event of an influenza pandemic, an effective vaccine will not be available until many months after the virus is identified. During these early weeks and months, public health officials will likely implement a variety of social distancing measures to contain contagion and to reduce morbidity and mortality in communities. Health officials will have the legal authority to close businesses and schools, prohibit public gatherings, limit travel and institute quarantine. In 2007, the Centers for Disease Control and Prevention issued guidelines to assist communities in implementing such interventions (U.S. DHHS(c), CDC, 2007). Importantly, these guidelines also include a pandemic severity index to help match the level of intervention with the case fatality rate of the pandemic. Under the scenario of a severe pandemic, the guidelines recommend that health officials close schools for as much as three months, and that businesses and other organizations may need to substantially alter the ways they function. Isolation and voluntary home quarantine will be encouraged for those who are ill or have been exposed to others who are ill. It is clear that effective implementation of such potentially onerous interventions will require a great deal of cooperation from individuals and organizations in the community. Many will confront work and childcare challenges, including supervision of healthy young children, maintaining isolation of teenagers and caring for children who become ill. In a national survey conducted in 2006, prior to the development of the CDC guidelines, Blendon and colleagues (2008)

found that most respondents said they would comply with proposed social distancing measures, but 57% expressed serious concern about jobs and finances if business closures were sustained for one month. Sixty percent of respondents said that if schools were closed for one month, at least one employed family member would have to stay home from work.

Social distancing measures will clearly limit personal freedoms, and may do so for large numbers of people and for extended periods of time. Public health officials must strike a balance when interventions designed to attain community benefits work at the expense of individual freedoms. (Although such restrictions may have some positive effects for individuals, they are primarily implemented to protect and sustain the health of the greater community.) The legal and policy principle of proportionality¹² is one standard that public health officials seek to maintain in order to achieve this balance. That is, officials strive to employ only as much burden on individuals or communities as is necessary to achieve the public health goal at hand, in this case containment or mitigation of disease (Gostin, 2000). We have, however, had limited experience employing the proposed social distancing measures in the U.S., and thus are limited in both our evidence of their effectiveness and our knowledge of the real burdens they will impose when implemented. The field of public health highly values scientific evidence of effectiveness of policies and practices. Unfortunately, social distancing measures have generally lacked strong empirical validation of effectiveness (Bartlett and Borio, 2008; Aledort et al., 2008; WHO, 2006).

¹² According to Gostin (2005), the case of *Jacobson v. Massachusetts* established four standards that must be maintained to balance government regulation with consideration for individual liberty in public health: necessity; reasonable means; proportionality; and harm avoidance. The concept of proportionality ensures that the burdens associated with a public health intervention are not “wholly disproportionate” to the benefits expected from the intervention. (p. 579)

Public engagement. When neither the science of public health nor the principles of justice are sufficient to resolve allocation issues or to determine which policies to implement, it may be valuable to engage the public in the decision making process. Public health academics and practitioners have vast knowledge and experience in the science of public health practice, yet they have no more moral authority to make value judgments than do members of the public. When policy decisions require ethical judgments, public involvement in the decision making process may engender trust in policymakers, which may be important when individuals are asked to do burdensome things, such as abide by allocation decisions that may not work in their favor (Lenaghan, 1999). It may help policy makers gain a deeper understanding about the expected burdens associated with the policies they propose, and may offer valuable insights into citizens' preferences for policies or principles to guide policies when science is not enough to determine the answers. Public involvement in policy decisions can occur in a number of ways.

One approach that holds promise is democratic deliberation. Deliberative procedures involve representative groups in informed discussions about issues that directly affect them (Abelson, Eyles, et al., 2003; Ableson, Forest, et al., 2003). A central tenet of deliberation is that free and equal individuals, often with dissimilar perspectives, join together in discussion with the opportunity to gain a deeper understanding of policy issues and the various contexts, understandings and points of view, and possibly reach a consensus on a recommended course of action.

Egalitarian principles of deliberation form the basis for equal opportunities for participation and reduction of existing social power structures, allowing participants to

work together as equals (Elster, 1998; Manin et al., 1987). When participants of equal moral standing disagree about issues, they may be able to maintain mutual respect for one another in a deliberative process (Gutmann and Thompson, 2002). Individual views may change based on the arguments of others (Miller, 2003) and individuals with disparate views on an issue may be able to agree on what is fair or what is in the common interest. Deliberation may lead individuals to empathize with others and may encourage those who disagree to "...set aside their adversarial, win-lose approach and understand that their fate is linked with the fate of the other...." (Mendelberg, 2001, p.2) Such processes may bring individuals together to create a coordinated effort to achieve societal goals. Gutmann and Thompson suggest that deliberative procedures encourage "public-spirited" perspectives. Such perspectives do not erase self-interest, but allow individuals a broader view of others' positions (1997, p. 39) It is, in part, this capacity for bringing about public-spirited views that makes deliberative processes particularly well suited for addressing the difficult, value-laden public health issues raised in pandemic planning and response.

Deliberative procedures are not expected to guarantee particular outcomes. Indeed, different groups deliberating about the same issues may put forth dissimilar recommendations or make different decisions about what constitutes a just outcome. But to some scholars, the process of deliberation is expected to do more than simply contribute to better decisions; it may be necessary to reach truly just decisions. Through deliberation, individuals consent to certain decisions that affect them, and transparent, explicit reasoning typical of deliberative processes allows this type of consent (Fleck, 1991). The idea that individuals should be able to see, understand and authorize the

process that governs them is a powerful attestation to the principle of respect for individuals. Deliberative procedures may involve a type of dialogue with policy makers or community officials in which officials must also share reasons for their actions or decisions. Such public explanation or justification is expected to improve the accountability of decision-makers to the participants or to the community at large (Eriksen and Fossum, 2002). Public discourse, along with leaders' justification of policy decisions, may help increase the legitimacy of a decision and public trust in the decision-making process (Lenaghan, 1999). In fact, many believe that the costs of not involving the public in the examination of ethical challenges could be severe. Inadequate attention to public perceptions of allocation policies or social distancing measures could lead policymakers to lose legitimacy and, more importantly, the public's trust. This could, in turn, lessen the effectiveness of policies such as public health response plans during a pandemic (Thompson, et al., 2006; Perhac, 1998).¹³

Deliberative processes have great intuitive appeal but they are not, as yet, frequently employed in the U.S. health care system (Ginsberg et al., 2006; Perhac, 1998). In 2006, the Association of State and Territorial Health Officials, along with the CDC and other organizations conducted a public engagement project with approximately 400 organized stakeholders and members of the public, from four geographic areas in the U.S., to discuss the trade-offs associated with social distancing measures likely to be imposed during a pandemic. They found that approximately two-thirds of their participants supported proposed social distancing measures. Participants identified four

¹³ There are some important arguments against deliberative processes as well. See Rowe and Frewer, (2000), for a discussion of the difficulty in achieving representativeness. See Dworkin, (1984), for consideration of the argument that procedures do not guarantee fair outcomes. Powers and Faden (2000) go beyond worrying about a bad outcome and suggest that there is a substantial risk that deliberation will produce no outcome at all in a pluralist society.

general challenges associated with such measures: the soundness of the planning, the economic impact, the information needs of the public and the social stresses that would be created (Keystone, 2007). In 2005, the CDC along with other organizations hosted a similar public engagement project to identify and set priorities among goals for a national pandemic response plan (Keystone, 2005). In addition, in 2007 the federal government hosted a web dialogue, encouraging input from the public during the design of the federal vaccine allocation guidelines. The web dialogue included over 400 participants whose input was used to modify the guidelines (U.S. DHHS (f) and U.S. DHS, 2008).¹⁴ The federal government also regularly posts proposed policy changes in the Federal register to solicit comments from the public as well as interest groups and other organizations. Academic researchers in other countries are also beginning to encourage public discourse on pandemic planning and response (University of Toronto, 2009; Damery, et al., 2009).

Methods

In July and August of 2008, we convened four focus groups with members of the public from four counties in Southeast Michigan¹⁵ to assess: 1) their input about processes to allocate scarce resources; and 2) their willingness to accept measures (commonly called “social distancing measures”) intended to control contagion and reduce morbidity and mortality in an influenza pandemic. Each group was made up of eight to ten adults, and lasted approximately 90 minutes. We conducted two of the meetings in

¹⁴ The guidelines document does not include any assessment of whether web dialogue differed in any important ways from in-person deliberations.

¹⁵ The four counties included Washtenaw, Livingston, Wayne and Monroe. These four counties make up the Region 2 South Medical Bio-Defense Network in Michigan. This network is funded by a federal cooperative agreement to coordinate the health response to disasters in this geographic region.

public libraries, one in a county community center, and one at the University of Michigan School of Public Health.¹⁶

We recruited participants by distributing flyers directly to daycare centers and places of worship, and by posting flyers in public venues including retail stores, coffee shops, libraries and community centers. We posted electronic messages on craigslist (www.Craigslist.org) and ran advertisements in the Detroit Free Press and the Monroe Daily News. Groups were selected to include some participants who were employed, and some who were parenting young children (school-age, or in pre-school or daycare) in order to generate rich discussion about the effects of pandemic response policies on the workplace, and the level of support for school and daycare closure during a pandemic. Participants were offered a \$25 Visa gift card and a box dinner for their participation.

After thorough review of the literature on social distancing measures likely to be implemented during a pandemic, we developed a focus group discussion protocol which included questions about resource allocation and social distancing measures (Bloor et al., 2001; Barbour and Kitzsinger, 1999; Greenbaum, 1998). Broad questions were followed by probes to explore participants' comments and arguments. A professional facilitator led the participants in discussion. Discussion opened with factual questions asked in a round-robin fashion, about length of residency in the county and previous experiences with disasters to engage all participants early in the session. Participants were then given a short (approximately 10 minute) educational session about influenza and pandemics, the expected surge in demand on the health care system and shortage of resources such as antiviral medications and ventilators, as well as a description of the social distancing

¹⁶ In March, 2008 the University of Michigan Health Sciences Institutional Review Board approved this study.

measures likely to be implemented during a virulent pandemic. Participants were encouraged to ask questions and clarification was provided where possible. The facilitator encouraged participants to discuss their reactions to proposed methods for allocation of scarce resources and social distancing measures likely to be implemented during a pandemic, and to respond to one another's comments. All focus group discussions were recorded and transcribed verbatim. Following the focus group sessions participants were contacted via email or telephone to gather demographic information. [See Table 4.1 for participant characteristics.] [See Appendix 4.A for Discussion Protocol. See Appendix 4.B for Educational Handout.]

We conducted qualitative, thematic analysis of the focus group discussion data (Creswell, 2006; Marshall and Rossman, 2006; Mason, 2002; Patton, 2001; Krueger, 1998; Miles and Huberman, 1994; Weber, 1990). After multiple readings of the transcripts, two researchers (NMB and SDG) developed a codebook to analyze the data systematically. The codebook was developed by inductively classifying emergent themes into categories of codes. We established inclusion and exclusion criteria and provided relevant examples for each code. We developed the codes interactively following close reading and comparison of the text, and discussed together the new themes and sub-themes suggested by the data. Two researchers (NMB and REK) then coded all four focus group transcripts independently. After coding two of the four transcripts coders compared decisions. Differences in coding decisions were discussed until agreement was reached. The codebook was modified to reflect new insights, and all four transcripts were recoded using the final codebook. The codebook and transcripts were imported into

NVIVO 8 software to facilitate nuanced analyses (QSR International, 2008). [See Appendix 4.C for Codebook]

Results

Of the 37 focus group participants, 81% were employed and 51% were parenting school or pre-school age children. Seventy-three percent were female, and the mean age was 43 years. The racial composition was 72% Caucasian, 25% African American, 3% American Indian and 3% Other, with all participants self-identifying all race categories that applied. Only 15% were health care workers, and 25% were uninsured within one year of the focus group sessions.

In group discussions, participants appeared to understand the potential morbidity and mortality risks associated with an influenza pandemic. Indeed, they expressed fear quite openly during their immediate responses following the pandemic information session. One participant said, “...*it takes months to develop the vaccine but it’s in hours that it’s going to happen, so it doesn’t seem like it matches up very well, so it’s pretty scary.*” Throughout the discussions, participants recognized the complexity of the decision making leaders will face planning for and responding to a pandemic. One woman shared, “*I’m grateful not to have to make these decisions.*” Another commented, “*I don’t know how you determine who deserves to die....*” Others talked about the need for coordination among health systems and geographic areas to ensure effectiveness of response plans.

Impact of Social Distancing Measures Likely Employed during a Pandemic

Despite their appreciation for the complexity of a pandemic response plan, participants expressed many concerns about the economic and other burdens associated with proposed social distancing measures such as the closing of schools, businesses and religious organizations.

Economic burdens. Immediate economic needs, job security, the need for essential goods and services, and long-term effects on the economy from extended business or school closure or quarantine were among concerns addressed in all four group discussions. For example, several parents, especially in two groups held in lower-income communities, viewed staying home from work to care for children during school or daycare closures as a “*luxury*” not all families could afford and still “*pay the bills.*” Similarly some¹⁷ worried that staying home from work, either to care for children or for illness, could lead to loss of a job:

Right now a lot of people are afraid of losing their jobs so they work while they're sick. They're pushing themselves afraid of losing their jobs if they don't show up, so I think there would have to be some kind of legal, something legal in place so fear would not put people in the worst way.

Participants readily identified elements of the economy, such as grocery stores, as important societal infrastructure that must be maintained during other closures. Many feared that extended closure of schools or businesses would irreparably damage an already fragile economy. One participant said:

If you shut down the schools though, you've basically shut down the economy because you'd have to have, then people would have to stay

¹⁷ The use of the term “some” in the results section means more than one, but less than all participants in any one group shared that particular view aloud. When a viewpoint was raised by one or more participants in all four focus groups, I have noted this in the text.

home so you're affecting a lot more than people getting sick, you've just affected a huge financial workings to the bulk of the country. That's a big decision.

Some feared that economic pressures to go to work would lead to unsafe situations, such as children left home unattended, or would further spread disease by unsupervised teenagers intent on socializing despite school or business closures. One mother added:

My high schooler will not stay home. I mean she would not self stay home or allow me to tell her to stay home. ... she's got work to do, stuff to do ... so that's from a parent of an older kid. It won't work (laughs).

Imminent threat. All groups discussed the need to have compelling reasons to endure the inconvenience or hardships such social distancing measures would bring. In light of the expected economic burdens associated with social distancing measures, participants expressed a need to know that threat of a disease was imminent and severe before agreeing to comply with policies that would likely be onerous and disruptive. One participant said, “*Well it would be total chaos if we start shutting down things before we know hard core facts.*” Another commented:

...that right now it's in some third world country and it may come here. I don't think that's going to be good enough. I think there's going to have to be some indication that it is actually in your own community before you take steps as drastic as shutting down anything.

Religious concerns. In all four groups some participants shared opposition to mandatory closure of religious organizations during a pandemic. They cited the importance of religious communities for support, for opportunities to worship and pray together during crises. One remarked:

I don't know, I think people should have the choice if they need to go to church for whatever reason at this time, this kind of thing and they're going to make the choice I guess to go out. That might be a place that they need to go.

Another man shared:

I personally feel that churches, temples, synagogues whatever, should remain open. I mean if it's a pandemic and there's marshall law imposed, you know, the populous is going to be in a panic, in a state of collapse, and people are going to turn to their, in large numbers, turn to their faith to sustain them ...they're going to want to be gathering.

Participants also shared concerns that religious gatherings may be important venues for information-sharing during times when community fear is high. Some wanted religious institutions to have the freedom to choose whether to remain open during a pandemic.

One participant commented, “*Seems like those places would make the decision themselves to close though, rather than having the government tell them they have to close down.*” The financial fragility of religious organizations was also a concern, with mandatory closure seen as a financial hardship for many institutions.

In contrast, a small minority of participants argued in support of the closing of churches, synagogues and mosques during a pandemic, considering religious gatherings to be voluntary activities and environments conducive for transmission of infectious diseases. One participant shared the following perspective:

...you cannot allow people to come together because it will cause more fatalities and then they'll go to the health care workers. The health care workers will be dropping like flies in a true pandemic and you cannot, you have to disallow any group meetings or you will just continue to spread the virus. It's a very cold thing to say, I realize that but it's a very realistic thing to say. ...Do we sacrifice health care workers so that they can have religion?

Allocation of Resources Expected to be Scarce in a Pandemic

Participants were asked to consider the basis on which to decide who will have priority for scarce resources, given the expected surge in demand on the health care system during a pandemic and the resultant shortages of antiviral medication, ventilators, vaccine and other necessary resources.

Determining priority for allocation. None of the four focus groups reached consensus about which population group should have first priority, nor about a guiding principle that should drive such decision making. Participants considered the merit of allocation schemes such as first-come-first served and lottery systems. They discussed who would be more likely to benefit from a scarce resource (e.g., most likely to survive if given an antiviral medication), who would be hardest hit by the virus, and who would benefit the most from a given resource.

“...You find the person most likely to survive their wounds, or in this case their disease and you treat them aggressively. If somebody is, if somebody’s 50 years old and is a smoker and has bird flu, you know, you go back and treat the 25 year old that’s an athlete and has the bird flu because he’s got more of a chance than the 50 year old.”

In each of the four focus groups, some participants favored giving children highest priority. Children were favored both because they are considered to be vulnerable to disease and because they have not yet had an opportunity to live a long life.¹⁸ One woman said:

“...I’ve been through enough. I’m happy with what I’ve been through and seen what I needed to see, and if it means that you know, a child can go on living, more power to them.”

¹⁸ This argument is often referred to as the “fair innings” or life cycle argument (Emanuel and Wertheimer, 2006; Callahan, 1987).

Some participants in each of the four groups favored giving health care workers priority over all other groups. Priority to this group was justified mainly for the utility health care workers would provide in caring for the large numbers of people who will need care during a pandemic.

“People in the health care industry, people that are going to help... people who are sick, get better. You know, anybody who has the ability to do that can be first on the list to be taken care of first.”

Similarly, all four groups reflected on the value of those who maintain the infrastructure that maintains the functioning of society. First responders, the police, military personnel, morticians and some scientists (e.g., those who make vaccine) were all considered in discussions.

Two group discussions included consideration of those who should have lowest priority for scarce resources, such as criminals or prisoners. One woman asked, *“Should we really save the life of a guy in prison or whatever? What if he is a killer or seriously mentally ill?”* This led others to voice broad objections to allocation policies based on social value because of the difficulty in determining such value. Some also expressed nuanced concerns related to the role social worth might play in allocation schemes:

“...this probably won't go over well but I thought, 'Oh great, I'm a middle-aged single woman. I would never get vaccine or anything because I'm considered obsolete and who would take care of me because I don't have you know, optimum health insurance or anything else,' and because when I'm sick, I generally do have to take care of myself...”

Two participants suggested that setting priorities among individuals and groups was too difficult because, they argued, all lives have inherently equal value.

Emphasis on fairness. Early in all four group discussions participants addressed the importance of fairness in allocation schemes. Worries about unequal treatment included

discussions of the ability to pay for needed services, insurance status, the ability to bribe and other unfair advantages the rich would have over the poor.

“She said that about the rich getting it and immediately I think...there will be a black market. I mean then they’ll get their antivirals, irregardless[sic] whether they’re paying it at the hospital or whether they’re paying it on the street, they’ll be getting it.”

Participants suspected that those involved in manufacturing vaccines or antiviral medications would have early access to supplies of them and would take what they needed for themselves and for their families. Other concerns included allocation among racial groups and for vulnerable populations such as the homeless. One man said, *“...I think you have to separate it fairly among the races. I mean it’s not just who’s in power...”*

Philosophical justification for allocation. Participants in the four groups used two main philosophical justifications for their allocation recommendations. Many made utilitarian arguments that emphasized allocation approaches that were best for society. They suggested that health care workers, police and military personnel should have priority for vaccine or antiviral medications so that they could “care for the rest of the people” and maintain the functioning of society. Classic utilitarian-based triage arguments were made to support provision of scarce resources to those who were “most likely to survive” a pandemic or to those who would require fewer resources in order to survive.

Egalitarian arguments included favoring the use of a lottery or per capita distributions of scarce resources, and generally treating everyone alike. These arguments were supported by reasoning that emphasized giving each member of society an “equal chance” and not valuing any one person over another. Participants wanted “everyone to

get what they needed” and complained that they were not comfortable giving preference to any particular group. One woman said, *“I’m really not comfortable with this [line of argument] because I feel like we are playing who is more important than someone else.”* Egalitarian arguments often followed discussion about determining which groups in the community would be most important for maintaining the functioning of society.

Beyond utilitarian and egalitarian arguments, participants supported other views with arguments that were less consequentialist in nature. Some argued that those who were the most vulnerable¹⁹ members of society should have priority for scarce resources. Often they spoke of those who were unable to care for themselves (e.g., children) or those who were the sickest (e.g., those with underlying chronic conditions) as groups that should have priority over others. These were often the first groups to be identified for priority by focus group participants. Other participants also made “fair innings” or lifespan arguments to prioritize the young over the old (Daniels, 1996). Many noted that members of society would likely act in self-interested ways during a crisis such as a pandemic, but none attempted to justify such acts.

Broad Themes

Common throughout the discussions about social distancing measures and the allocation of scarce resources were broad themes of public-spirited attitudes, desire for opportunities for public input into policy processes, and distrust of the government.

¹⁹ Helping the most vulnerable can also be viewed as a utilitarian/consequentialist argument when it is argued that resources spent on the most vulnerable create the largest gains, and therefore provides society with the greatest return on its investment.

Public-spirited attitudes and public involvement. Group discussions elicited recognition of an extant duty not to infect others if exposed or sick with influenza. They spoke of the interconnectedness of individuals in communities, and discussed the importance of modifying personal routines “for the good of everybody else.” One woman said, “*During an emergency like this, community will be the only thing – we can’t remain isolated to cut our losses.*” Some commented on the design of pandemic response policies and the importance of keeping the larger community in mind. One participant noted that necessary policies may not be popular:

I agree there has to be a plan and that plan has to be stuck to, no matter what but the plan can’t be created based on popularity and what, you know, what will make the most people happy because what will make the most people happy is certainly not the common good.

Some suggested that policymakers should be “selfless” in designing and implementing community action plans, and that plans must not cater to individual interests but must be designed with broad community goals in mind.

In contrast, participants in three of the four groups acknowledged that strong self-interest often holds sway during public disasters. This contributed to comments both about the self-interest of others (e.g., those who manufacture antiviral medications taking some “*off the top*” for their own families) and their own intense desires to keep their loved ones safe. One woman remarked:

We always think of self first and that’s being real about it. I’m not thinking about if you going to be okay... I mean frankly speaking, you know, that’s being honest and right then and there, we’re not thinking about let me save the world.

Participants shared a desire for accessible and accurate information about limiting contagion and apportioning scarce resources. Some complained that they had never

received any information about pandemic preparedness from their local health department or knew of any recent educational efforts within their communities.²⁰ *“Make a plan and stick to it,”* said one participant, and that included, for her, making sure the public knew the plan. Others implored policy makers to provide opportunities for community input. One woman said, *“Focus groups are important. Listen to the average citizens. If there are task forces, citizens should be on each task force.”* Another emphasized the importance of opportunities for public input adding, *“Listen to the people. Groups like this are important. The public have well meaning opinions that the policy makers may not know. Listen to the people.”*

Distrust in government. Despite desires for public input and public education, participants in all of our focus groups, which were held in well-off, low-income and middle class communities and included participants from underrepresented minorities, articulated distrust of government. They did not distinguish between federal, state or local governments, but participants in two groups referred to “politicians,” clearly referring to elected officials, whereas others referred more broadly to “the government.” Participants suggested that politicians would do the politically expedient thing rather than what is right in a crisis, and that public officials may not always convey accurate information to the public. Participants expressed skepticism that politically difficult decisions would trump desires for re-election, and that politicians would, like others, be looking out for themselves by seeking special treatment, as indicated in this comment:

²⁰ One county health department held a public educational session about pandemic preparedness just one week prior to our focus group meeting. The session was advertised both in the local paper and on local radio stations, yet none of the participants in our focus group was aware that it had occurred.

With the government, we already know, they're going to know and they're not going to let us know until a week or two later, after the outbreak has already started so you know, they're going to get their's and they'll be vaccinated. They're going to make sure their families are taken care of.

Participants emphasized the importance of involving citizens in plan development and enforcement of response plans without undue influence from interest groups.

In contrast, one participant spoke positively of a governmental role in controlling an expected surge in demand for scarce resources (in this case, antiviral medications).

Process of deliberation. Although the focus group sessions were limited to 90 minutes, including a brief education session, we were able to identify signs that, even in such a short period of time, participants were capable of deliberating about important public health issues. Participants considered difficult public policy issues, listened to others' perspectives, agreed and disagreed with one another, and at times appeared to have influenced fellow participants' positions (Gutmann and Thompson, 1997). For example, when asked whether they would support the mandatory closing of religious institutions during a pandemic, these three participants shared different points of view, justified their positions, and considered others' positions:

A: ...I think people should have the choice if they need to go to church for whatever reason...

B: I disagree...you cannot allow people to come together because it will cause more fatalities and then they'll go to the health care workers. The health care workers will be dropping like flies...you have to disallow any group meetings or you will continue to spread the virus....

C: I personally feel that churches, temples, synagogues whatever should remain open...people are going to turn to their, in large numbers, turn to their faith to sustain them...But you know, to temper that, there should be some communication to the populous at large that you're doing it at great risk to yourself and to the

public and you need to be warned against it, but I don't think that you can tell somebody that they can't go to church...

It was clear that participants often considered their own positions on issues in light of others' perspectives, as evidenced by phrases such as, "...*I think that is a weak area for many of the reasons that Mary Ellen said.*" and "*Well, going against the grain too, I'm skeptical...*" and "*I think building on kind of what you were saying too Matt, I think...*"

When asked to consider how policymakers should decide who receives scarce resources during a pandemic, participants in one group ruled out one option (decision-making by lottery) through discussion:

A: I don't know, how crazy would the thought of a lottery be...so that you're not picking anybody over somebody else for whatever reason?

B: But would you wait until the emergency happened to make that decision...every decision has to be made prior to the event happening...I'm not saying it would be bad but it would have to be done like this year so that when it happened in a couple years, then that lottery ticket would become a commodity.

A: ...what if your three kids got the lottery and the parents did not or something like that.

C: ...you create a lottery, it creates it's own problems.

A: Yeah, it would be, (laughs) just a thought.

D: Your value to society, you have to come in there, it can't just be as plain as you take 10 people in a row and you pick 2...

Discussion

This study grapples with questions of fairness and equity in the distribution of public resources as well as burdens and benefits associated with social distancing measures. Our experience to date with the H₁N₁ influenza A virus brings to light some of

the complexity of dealing with an unpredictable contagious disease, and puts to the test the emergency preparedness efforts, including for pandemics, that have figured prominently in public health departments since September 2001.

With limited information, for instance about mortality rates, and varying legal authority in communities to implement social distancing measures, public health responses to this virus varied (Hodge, 2009). Numerous communities closed schools and other public venues. Differing responses on the part of public administrators and a spectrum of news reports about the threat (or lack thereof) from H₁N₁ tend to be mirrored in public reactions, which may range from excessive fear of contagion to beliefs that “it’s just the ‘flu’” and that the government’s reaction is overblown. Information campaigns exhort the public to stay home if they are ill, avoid contact with others who appear ill, avoid crowded venues, avoid unnecessary travel (in the case of H₁N₁ usually to Mexico), and maintain a “safe distance” from everyone. At least one state added the threat of fines to pressure people to stay home (Hochberg, 2009).

Differences in community responses are likely due, in part, to the lack of clear evidence on the effectiveness and optimal use of social distancing measures. Experts advocate school and other closures based on the best available evidence, as well as past experiences with other infectious diseases, but in the face of uncertainty about contagion and virulence of a novel infectious agent, judgments about timing and duration of closures will vary. Valuable historical research conducted by Markel and colleagues sheds some important light on the question of effectiveness. They found that during the 1918-1919 pandemic, which was both highly contagious and virulent, those cities with early and sustained social distancing interventions had lower peak and overall death rates.

Such interventions were intended not just to reduce attack rates and mortality, but also to slow transmission, which today might also provide society time to prepare vaccines, disperse antiviral medication, and bolster response plans in communities not yet infected (Markel et al., 2007). Yet it is precisely the extended time period of social distancing measures that worried so many of our participants. They discussed their concerns in the context of their everyday lives -- concerns about job stability, financial fragility and their abilities to truly keep children and teens in safe, isolated environments. These social and financial concerns are consistent with findings from a national survey conducted by Blendon and colleagues in 2006, which informed the Centers for Disease Control and Prevention's recommendations for community nonpharmaceutical interventions (Blendon et al., 2008; U.S. CDC, 2007).

Such economic concerns are justified, not only because so many in Michigan and other places in the country are experiencing high unemployment rates and are in tenuous financial condition, but also because currently there is no program to provide income support to individuals who are out of work for an extended period of time as a result of a pandemic or other public health disaster. Pandemic response plans in some other countries, such as Australia, include provisions for income assistance to individuals who suffer lost income due to a pandemic (Commonwealth of Australia, 2009). During the SARs outbreak in Canada in 2003 the Ontario government instituted some financial assistance and job protections for individuals who lost income due to their own quarantine or their need to care for a family member who was quarantined (Reis, 2004; Government of Ontario, 2003). Workers with young children may lose their jobs if schools and daycare centers close, compelling them to stay home to supervise their

children. The Family Medical Leave Act may offer job security if a family member has a serious health condition, but there will be a great many healthy children who will need supervision and whose parents would not meet the Act's criteria (U.S. DHHS (e)). The economic concerns we heard from our participants should serve as a caution to policy makers about public willingness to comply with sustained social distancing measures. Policy makers must address such concerns to effectively implement and sustain social distancing measures during a pandemic. Future research should examine the impact of government provision of financial assistance on the public's support for social distancing measures.

Participants' perceptions of what constitutes an imminent infectious disease threat may be tied to their concerns about job security as well. Many suggested that disease must be present in their own communities before they would accept or support business, school or religious closures. While this requirement for close proximity seems financially prudent, it may ultimately put communities at greater risk of infection and compromise their abilities to minimize the negative impacts of the disease, including on the economy. Indeed this tension was recognized by participants. One participant with an infant in daycare commented that she would likely keep her child home from daycare even if their particular setting was not officially closed due to a pandemic, to further reduce her child's risk of infection. At least one participant in each of the groups shared intentions to voluntarily keep their school-age children home in the event of a pandemic, even if their children's schools were not officially closed. Further empirical assessment of public reaction to the early 2009 H₁N₁ outbreak will be important to gauge expected public responses to a severe pandemic in the future.

The findings from this study reveal at least two broad ethical challenges with which policy makers must contend to ensure that public health responses to a pandemic are just. The first is the tension between protecting personal autonomy and promoting community well-being. To what extent should public health officials implement home quarantine or mandate business, school or religious closures to reduce the spread of influenza in a community? The well-being of a community is not simply the aggregated health status of individuals within the community, but is also the economic and social environments in which those individuals live. Any community-wide public health effort to manage an influenza pandemic must then balance the effort to contain contagion with the other important community needs for viable businesses and religious organizations. There is a long history in public health policy and practice of restricting individual rights when needed to reduce health risks to a community, such as vaccination requirements for school entry and limitations on smoking in public places. Out of respect for individual freedoms, however, these restrictions are not employed lightly. For example, mandatory closure of private entities during a pandemic may even require a declaration of an emergency before public health officials have the authority to execute such restrictions.

The free exercise of religion has special status in our society, as set out in the First Amendment of the U.S. Constitution, so it is not surprising that many participants in our focus groups had strong reactions to the possibility of mandatory closure of religious institutions. Closing religious institutions in response to a pandemic may thus prove to be particularly challenging for health officials. Participants in our groups emphasized the importance of religious gatherings during times of crisis, suggesting that contingency plans to provide alternative avenues for spiritual guidance and support must be

considered. Given the skepticism and distrust of government many of our participants expressed, restrictions on religious observance, which could offend or anger citizens during a time in which they already feel threatened, could prove to be a significant hurdle. It will be important for public health leaders to not only communicate with religious organizations but also to coordinate their actions with those of religious leaders. While public health laws officially give authority to public health officers in communities, unofficially officials should find ways to present shared authority with religious leaders to maximize community compliance.

The second ethical challenge highlighted by our findings concerns the need to ensure that the benefits and burdens associated with proposed policy actions are distributed fairly. Policy makers will need to ensure that vulnerable populations do not disproportionately shoulder unfair burdens (e.g., high rates of job loss) or receive fewer benefits (e.g., lower use of antiviral medication) than other groups, due to the implementation of social distancing measures or to particular elements of allocation schemes. The financial struggles that many will face as a result of mandatory school or business closure for instance, will be most pronounced for low-income workers and the least well-off in society. These groups will have fewer personal financial resources to sustain them during closures and may be at higher risk of job loss if they lack vacation or sick leave benefits. They may also be less able to negotiate systems to obtain information about how to prepare for a pandemic or respond to an outbreak, or how to access limited resources. It will be a major challenge to public health officials and local community businesses and organizations to create the support necessary to meet this challenge, since

currently state and federal plans do little to protect against the financial consequences expected with sustained closures.

A number of frameworks have been developed to assist policy makers and practitioners to consider the ethical implications of public health actions and to help determine when individual restrictions and other policy actions are justified. (Baum et al., 2007; Gostin and Powers, 2006; Bayer and Fairchild, 2004; Nieburg et al., 2003; Childress et al., 2002; Callahan and Jennings, 2002; Kass, 2001.) Common among most of them are considerations of: a) whether the proposed restriction on the individual is expected to be effective in achieving its intended goals; b) whether failing to implement the policy would cause greater harms; c) whether there are less restrictive options that could achieve the goals; and d) whether the benefits and burdens associated with the policy are equitably shared among community members. Since the empirical evidence of the effectiveness of social distancing measures is limited, and there are potentially large and predictable economic and other burdens associated with these measures which are likely to be unequally distributed, policy makers may have a special obligation to consider both how to mitigate inequities and provide opportunities for public education and input in the policy making process. Deliberative processes can offer individuals opportunities for engagement in complex issues such as these. When individuals learn about an issue and better understand the ways the particular issue may affect them in their daily lives, they can, in turn, help policy makers understand diverse points of view about, and likely responses to a proposed policy. In the case of social distancing measures, deliberation may be an effective process to gain public insights and to gauge both the level of burden the interventions are likely to produce, and the extent to which

individuals will comply with such interventions. For allocation policy, if members of a community perceive too few benefits or too many burdens will fall to them, public unrest may ensue. Public deliberation before the onset of a serious pandemic may allow individuals to consider important details of allocation schemes (e.g., to see which groups are given high priority for scarce resources and to discuss the rationale behind such decisions). Deliberation may also create important venues for informing policy makers whether policies and plans are consistent with community values and conceptions of fairness.

Those deliberating may or may not come to consensus on some of the more difficult questions, such as which population group should receive priority for scarce resources, but the process of deliberation may itself be useful. It is not surprising that in a short, 90-minute focus group participants did not reach consensus on difficult moral questions. Yet even under such limited circumstances, individual participants were able to share their own informed opinions and to listen to those of others. These members of the public raised many issues currently discussed in the public health ethics literature about the various conceptions of fairness in allocation schemes, and offered a wealth of life experiences to illustrate their claims. This study was designed as a pilot for a deliberation project that would incorporate more participants and would likely include a condition that groups attempt to reach consensus.

In deliberation, affected *individuals* may behave as *citizens*, and work toward a goal that is perhaps larger than themselves (Abelson, 2009b; Gutmann and Thompson, 1997). Those holding dissenting views are encouraged to share them and, importantly, to share the reasoning behind those views. This may challenge existing perspectives,

encourage some to change their minds or it may simply create some common ground on which to base a group decision. Gutmann and Thompson (2002) suggest that there may be times when individuals do not get what they want or need in a deliberative process, but that if the process is perceived as fair, those individuals participating in the deliberation can accept the collective decision as legitimate. Even if a deliberative group does not come to consensus, their discourse may inform policy makers' decisions. That is, the deliberations themselves may offer clarity and a significant depth of understanding. It is important to recognize, however, that even if consensus is reached, even high quality democratic deliberation does not guarantee that any particular outcome will be right or just. In some cases, the public may "get it wrong" and may put forth recommendations or make requests that are not in the community's best interest, are inconsistent with expert knowledge, or are in conflict with another important societal principle or with the rights of a certain group (Chamberlin, J. 2009; Dworkin, 1984). In general, deliberative processes are not intended to directly set social policy, but rather to inform the larger policy process.

Our participants showed a clear capacity for deliberation. As members of the public, most with no health care background, they were able to discuss a complex and challenging public health issue, to listen to others' opinions and to share opposing viewpoints. They identified issues and articulated concerns about the economic and other burdens associated with social distancing measures and resource allocation schemes that academics and policy makers in the U.S. and around the world recognize as important in pandemic planning and response. Deliberative procedures can be employed in many parts of the world, yet because an important principle of deliberation is that free and

equal individuals join together in discussion, this process may only be feasible in democratic societies. To ensure that a variety of viewpoints are included, policy makers purposefully bring together individuals from various sectors of society, which may be a tall task in societies where social divisions are pronounced.

While the broad constructs of democratic deliberation are described and supported by many in the literature, there is, as yet, no consensus about a particular method(s) that must be used to ensure an effective or productive deliberative process (Abelson, 2009b ; Gostin, 2009). Our participants showed a capacity for deliberation and offered individual advice to policy makers, but they were not pushed to reach consensus on any one issue. Does this study constitute a deliberative process? In order to learn whether deliberation “works,” whether it achieves better or more just outcomes, we must be clear about what we mean by “deliberation.” This clarity is necessary to achieve internal validity in evaluation research and to accurately measure outcomes.

While much of the discourse we describe highlights challenges in pandemic response, participants also exhibited public-spirited perspectives on which to build. Most groups emphasized the need to maintain essential services, paralleling outcomes from one of the CDC’s public engagement projects (Keystone 2007) and consistent with the recommendations of some scholars (Kass *et al*, 2008). In a pandemic, health officials will need to ask citizens to comply with voluntary social distancing provisions (e.g., home quarantine) to minimize the use of enforcement measures. Our participants’ concern for the health of the entire community suggests that individuals could and would comply with policies that are challenging personally, if the community benefits are clear to them. It is important to note, however, that these focus groups were conducted at a

time when influenza activity was normal, and no influenza pandemic had been declared. In recent commentary on a portion of this study, Gostin noted that what participants espouse during deliberation may not reflect their true actions during a crisis (2009). Policymakers should heed participants' requests for education and opportunities for public input in planning processes. If individuals feel disconnected, poorly informed, or without a voice in designing policies that have a direct impact on their lives, further distrust in government could ensue. The current H₁N₁ outbreak provides opportunities for comparing communities with and without meaningful public input in planning processes.

This study suggests numerous implications for policy makers. Based on our findings, even in the face of a pandemic, social distancing measures may be challenging to implement and sustain due to strains on family resources and these challenges will be exacerbated by lack of trust in government. The effectiveness of risk communication to the public during emergencies depends, in part, on the existence of public trust in government (Wray et al., 2006; Shore, D. 2003; Covello, V., 2003). The participants in our focus groups, by and large, expressed a fundamental distrust of government. If these attitudes reflect those of the broader public, it may be difficult to adequately inform communities about pandemic response plans and to achieve compliance with social distancing measures.

Policy makers must consider incorporating mechanisms for financial support into response plans, particularly for the poorest sectors of society, if social distancing measures are likely to be sustained (Holm, 2009; Viens, 2009). Public education and input in policy processes could provide communities with realistic expectations and help

ensure compliance with response measures or difficult allocation schemes -- our participants were clear in their desire for timely and accurate information. It will be particularly important for public health officials to work in conjunction with religious and other community leaders to execute social distancing plans effectively, without creating animosity that may erode compliance. Given that many participants shared public-spirited attitudes, emphasizing the community benefit of individual sacrifice may also be a successful strategy. Policy makers must assess the public response to the current H₁ N₁ influenza outbreak, in particular the burdens associated with the relatively brief social distancing measures that were implemented in various communities, and identify ways to support those who need it most. Current planning efforts should include public dialogue and clear leadership from public officials to engender trust and legitimacy in potentially contentious pandemic response plans.

This exploratory study is limited in scope. Our results are based on participants from four different communities in one particular geographic region in Michigan. Still, given the scant literature on public views of social distancing and resource allocation during pandemics, our findings may provide public health officials with some important insights. Those officials who struggle with the tensions between individual freedoms and public well-being and are cognizant of the risk that a pandemic could worsen existing societal inequities, may gain a deeper understanding of how members of the public see those tensions. Additional empirical work is urgently needed to gain a clearer understanding of public views and willingness to abide by pandemic response plans.

This study was designed, in part, to assess whether deliberative procedures would produce useful information that could enhance the policy making process about pandemic

preparedness and response. By at least some definitions, for processes to truly be deliberative, participants must reach consensus on the topic at hand (Abelson,2009a). In our short focus group sessions we did not feel there was adequate time to push groups to reach consensus, either on perspectives on social distancing measures or on the bases for allocation decisions. Future research will extend the length of the deliberative sessions to allow the important process of consensus building to take place.

To be sure, our participants' concerns give us pause when we think about implementation of social distancing measures and priority plans. Yet we have learned lessons from other recent public health emergencies that the lack of appropriate public health response can result in significant community burdens and unwanted consequences. The process of resolving ethical issues inherent in planning for and responding to a pandemic may benefit from public engagement and deliberation. Democratic deliberation may serve as an effective catalyst in the process of resolving ethical challenges in pandemic preparedness, especially if such processes can be shown to increase transparency, gauge community support for proposed interventions, and provide policy makers with information about the issues that concern community members.

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Table 4.1: Participant Characteristics, n=37

Characteristic	Value
Median age†	43yrs
Women	73%
Employed	81%
Parenting young children	51%
Health care workers†	15%
Race†	
African American	25%
Caucasian	72%
American Indian	3%
Native Hawaiian/Pacific Islander	0%
Latino	0%
Other	3%
Education†	
High school	9%
Some college	38%
Bachelor's degree	38%
Master's degree or more	16%
Insured at time of focus group†	84%
Uninsured within last year†	25%

† n=32

Participants self-identified race and chose all that applied from:
African American, Caucasian, American Indian, Native
Hawaiian/Pacific Islander, Asian, Latino, Other

APPENDIX 4.A DISCUSSION PROTOCOL

Ethical Issues in Pandemic Influenza Preparedness: Focus Groups for Public Engagement

1. Introduction by Facilitator (5 min)
 - a. Explanation of the purpose of group session – Joy Calloway
 - b. Informed consent and description of use of data – Nancy
2. Opening questions to engage the group - Joy (10 min)
 - a. How long have you lived in the county? Have you ever experienced a widespread emergency or other situation during which your community had to work together to solve a problem?
 - b. Before coming to this focus group, what were your thoughts about the possibility of a flu pandemic and its ramifications?
3. Briefing on Pandemic – Nancy (10 min)
 - a. Facts about pan flu, definitions of key terms (e.g., quarantine), brief history of past pandemics. Although pandemic may not be prominent in the news in recent months, it remains a very real threat
 - b. Description of expected impact of disease on the community, excess demand on health care system and expected public health response
 - c. Description of limitations in public health response (e.g., too few antivirals and ventilators, lag time to develop and distribute vaccine) and expected non-pharmaceutical interventions (e.g., social distancing measures)
 - d. Some problems not easily solved by the law or by science. What “should” this community do in response to a flu pandemic?
4. Discussion re: willingness to accept social distancing measures – Joy (30 min)
 - a. Would you support the closing of schools and daycare centers before the pandemic strikes [your community]? Before it strikes Michigan? Why or why not? Would you support the closing of worksites? Of religious organization meetings?
 - b. Would you support school closings for a sustained period of time (e.g. three weeks) Why or why not?
 - c. Would you support encouraging those who have been exposed to the flu but who are not yet sick to stay home from work and school? Why or why not?
 - d. Would you support quarantine or travel restrictions for those exposed to the flu? Why or why not?
 - e. What is your advice to policy makers?
5. Discussion re: acceptance of processes that may be employed to allocate scarce resources – Joy (30 min)

- a. On what basis should we decide who should receive the limited antiviral medications or ventilators during a pandemic?
 - b. Should limited vaccine supply (or antiviral medication) be given first to those most likely to die from (or be hospitalized because of) a flu pandemic, or should it be given first to those with jobs that are essential to keep society functioning (e.g., those who make vaccines, maintain public safety, run the utility companies, key government leaders, others?) Please discuss your reasoning.
 - c. What is your advice to policy makers about how to manage scarce resources during a pandemic?
6. Wrap-up – Nancy (5 min)
- a. Final thoughts – Now that we've had this discussion, have your thoughts about a flu pandemic changed? If so, in what ways?

Pandemic Flu

What is pandemic flu?

- A global outbreak of a strain of the flu that causes serious illness
- Easily transmitted from person to person, with little or no immunity in the population
- Previous pandemics in 1918, 1957 and 1968
- Related terms: "bird flu," "avian influenza," and "H5N1 flu"

Why are we worried about pandemic flu now?

- Today, there is no flu pandemic. However, experts predict we may experience a pandemic sometime soon.
- Ease of worldwide transmission today
- There have been hundreds of human cases of avian flu, mainly in the developing world, where resources for surveillance and response are limited
- No vaccine is commercially available. Once a flu strain is identified it takes many months to produce a vaccine

What will happen if/when a pandemic strikes?

- Exact impact is unknown, but many people in many places would become sick at the same time. Impact depends on severity of the virus and societal ability to reduce the spread of the disease and to treat those who become sick
- Many people would have to stay home from work, either because they are sick or to care for family members who are sick
- Schools, pre-schools and many businesses and religious organizations would have to close for a long period of time, perhaps many weeks
- Multiple waves of infection (6-8 weeks) through the community
- Travel restrictions
- Quarantine or isolation

What problems will we face?

- Social and economic disruption in schools, workplaces, daycare or religious settings may last for many weeks. Individuals may not be prepared to remain in their homes for extended periods
- Health care systems will be overloaded. Death rates will be high. A large proportion of the population will need medical care, with large numbers needing to be hospitalized. Medical supplies such as beds, ventilators and antiviral medications will

not be able to meet the demand. Fewer health care personnel will be available because they, too will be sick or needed at home to care for sick family members

- It will take many months to develop a vaccine for the particular flu virus and there will be limited supply early in production. Antiviral medications may be in short supply and may not be effective against particular virus. Difficult decisions will need to be made about who gets the limited supplies of vaccine, antiviral medications, ventilators and other scarce items.

Sources of information:

<http://www.pandemicflu.gov>

<http://www.michigan.gov/mdch>

Contact information for Principal Investigator: Peter D. Jacobson, JD, MPH

734/936-0928 or pdj@umich.edu

Contact information for Co-Investigator: Nancy M. Baum, MHS

734/763-4394 or nmbaum@umich.edu

APPENDIX 4.C CODEBOOK

Focus Groups on Ethical Issues in Pandemic Preparedness

DISCUSSION TOPICS

1. Initial impressions/thoughts OR text later in discussion that applies directly to these codes
 - a. Generalized fear
 - i. Fear of contagion
 - b. Worries about unequal treatment
 - i. b/c of insurance status
 - ii. b/c of \$; ability to bribe
 - iii. b/c of race
 - iv. b/c of social worth
 - v. b/c unable to care for self; vulnerable pops
 - c. Fear of losing job
 - i. b/c stay home to care for others
 - ii. b/c exposed or sick
 - d. Fear of inability to adequately prepare
 - e. Concern for self
 - f. Other
2. Social distancing issues
 - a. School closure
 - i. Schools vectors for spreading disease
 - ii. Children will be left home unattended b/c parents must work; safety issues
 - iii. Many will keep kids home even if schools not closed
 - iv. Need a “real” reason to close schools;
 1. Threat is imminent
 2. Will cause great economic impact
 - v. Teens may not comply
 - vi. Good epidemiology & disease tracking instead of school closure
 - b. Business closure
 - i. Long term effects on the economy
 - ii. Must maintain infrastructure; certain businesses must not close
 - iii. Economic hardship too great if shut down too long; too early;
 - iv. Impact may not be severe for certain businesses or industries
 - c. Religious institution closure
 - i. People need religious institutions during times of crisis
 - ii. People should be free to or have right to gather and worship together
 - iii. Leave it up to individual religious institutions to decide when or if to close;
 - iv. Closure creates economic hardship for religious institutions
 - v. Closing religious institutions would not create serious hardship

- d. Travel restrictions/quarantine
 - i. Government boundaries such as county lines do not hold – school districts different from county lines
 - ii. Desire to keep people “out” (e.g., of Michigan; of own county)
 - iii. Quarantine should be voluntary; freedom most important
 - iv. Quarantine may help control fear & chaos
 - v. Quarantine can have serious limitations; concerns about meeting basic needs
 - vi. Enforcement of quarantine difficult
 - vii. Difficult to know when to apply b/c don’t know who has been exposed
 - e. Motivation or justification for invoking social distancing measures
 - i. Depends on how “severe” the virus is
 - ii. Depends on how imminent the threat is
 - f. Other
3. Setting priorities for allocating scarce resources (vaccine; antiviral medication; ventilators)
- a. Priority to children
 - i. Because they haven’t lived as many years yet
 - b. Priority to caregivers
 - c. Priority to health care workers
 - d. Priority to vulnerable populations
 - i. Homebound
 - ii. Chronically ill
 - e. Priority to first responders/police
 - f. Priority to those who maintain infrastructure or have important social role
 - g. Priority to those who will benefit most
 - h. Priority by lottery
 - i. Priority by first come first served
 - j. Priority by most likely to survive
 - k. Priority to most valuable to society
 - l. Lower priority for prisoners & criminals
 - m. All lives equally valuable
 - n. Other

EMERGING THEMES

- 1. Distrust of Government
 - a. Politicians will do what is politically expedient, not stick to plan
 - b. Those stockpiling/making vaccine will take what they want
 - c. No public policy can protect against influence of \$
 - d. Policy makers & politicians should be selfless
 - e. Involve others (e.g., health care workers, scientists) in planning
 - f. Politicians & government workers may give the populace false information
 - g. Counter view: government will do what is right

2. Importance of educating the public
 - a. Media messages must be coordinated and clear
 - i. Because public will be more compliant
 - ii. Because it will prevent panic
 - b. Public deserves to be informed
 - c. Other
3. Importance of public input
4. Community-mindedness (“public spirited”)
 - a. People will do what is right to reduce spread of disease
 - b. Individuals have duty not to infect others
 - c. Plan based on science, not popularity, for common good
 - d. Lack of community-mindedness; self-interests first
5. Need/desire for fairness in allocation schemes
 - a. Desire not to exacerbate existing social inequalities
 - b. Fairness ensures compliance
 - c. Other references to fairness
6. Recognition of complexity/difficulty in planning and response
 - a. Importance of enforcing & sticking to a plan without influence from interest groups
 - b. Fear that plan and response will not be adequate or effective
 - c. Money will not or may not be adequate to address need
 - d. Complexity requires coordination
 - e. International interdependence
7. Role for supportive therapy
8. Policy suggestions/creative solutions
 - a. Politicians and health care systems need to be prepared; stockpile
 - b. Plans should be flexible to accommodate unforeseen circumstances
 - c. Plan now to substitute on-line learning during school closure
 - d. Educate the public now; use “drills”; train volunteers
 - e. Safeguard jobs
 - f. Other
9. Good quote
 - a. Section 1
 - b. Section 2
 - c. Section 3
 - d. Section 4
 - e. Section 5
 - f. Section 6
 - g. Section 7
 - h. Section 8
 - i. Section 9
 - j. Section 10
 - k. Section 11

Chapter 5

Conclusion

Through qualitative and quantitative research methods, this dissertation contributes to the field of public health systems research by increasing the knowledge base about resource allocation in public health practice. Using data from two national surveys, we analyze the types of allocation decisions local health officials (LHOs) make, the factors that influence those decisions, and the role that discretion plays in allocation decisions. We also employ focus group data to assess public deliberations about pandemic response policies.

Summary of Findings

Survey results in Chapter 2 indicate that most LHOs do not shift resources among population groups, but they do alter the tasks their staffs perform, allowing them to emphasize certain activities or services. Factors that heavily influence allocation decisions include: the effectiveness of an activity or service; status as the sole provider of a service; previous budgets; input from a Board of Health; and reluctance to lay off staff. In contrast, the least influential factors in allocation decisions include decision tools or economic analyses, direct public input, needs assessments and input from colleagues in other departments.

Findings that LHOs do not shift resources among population groups are consistent with LHOs' concerns that they have little flexibility to reallocate program funds. When making allocation decisions, effectiveness is reported as the most influential factor, yet it is not clear that LHOs have access to adequate effectiveness data on which to base allocation decisions. In addition, ensuring access to services has long been a priority for local public health, making it difficult to end funding for a service if the health department is the sole provider in a community. Reliance on previous budget schemes does not encourage a re-examination of priorities or a determination of whether an allocation plan is consistent with current public health goals.

Officials may rely less on decision tools or economic analyses during allocation because their departments lack the necessary expertise to use them, or because they may not see existing tools as useful or appropriate. Despite the fact that assessment is a core function of public health, this foundational activity is generally not being conducted in conjunction with allocation decision making.

As discussed in Chapter 3, officials reported that they can reallocate nearly one-third of all department revenues and nearly half of all personnel time at their discretion. Sixty-five percent reported a "great deal" or "complete" control in allocation decisions. These levels did not vary significantly by the size of the health department. Levels of discretion did vary, however, by governance structure, with officials from locally governed departments reporting significantly higher discretion than those from state governed departments. Contrary to our hypothesis, officials running departments with higher proportions of revenues from local sources did not report significantly higher levels of discretion. Since locally governed departments receive higher proportions of

revenues from local sources, and officials in locally governed departments report higher discretion, further research focused on the relationship between discretion and funding sources should be pursued.

Multivariable analyses indicate that in the absence of a Board of Health, higher per capita expenditures are associated with lower discretion. This may be because departments draw revenues from funding sources readily available to them, but such funding may be earmarked for specific populations or services and not directly tailored to community needs. In the presence of a Board of Health, however, such expenditures are associated with higher discretion. This indicates that Boards may be effective in ensuring adequate and appropriate funding specific to communities' needs, reducing the need to seek extra funding.

Bivariate analyses indicate a positive association between increased discretion and decreased unmet need for ten specific public health services. It will be important to conduct more nuanced analyses of the relationship between discretion and capacity to meet community public health needs, and to assess the ways that officials operationalize discretion in their daily work.

In Chapter 4 deliberative groups addressed issues of fairness and equity in the distribution of scarce resources as well as burdens and benefits associated with social distancing measures during a pandemic. None of the groups reached a consensus about which populations should have priority or one guiding principle that should drive allocation decisions. Each emphasized fairness and invoked utilitarian and egalitarian justifications for allocation. Some also argued for priority to the most vulnerable or made lifespan arguments for allocation to the young.

Discussions of social distancing measures raised fears about economic burdens associated with job and school closure, as well as concerns about lack of freedom and loss of support during closure of religious institutions. Participants emphasized that threat of infection must be imminent before closures would be justified. Broad themes addressed in discussions of both allocation and social distancing included distrust of government, public-spirited attitudes and desire for public involvement in policy processes. The data from these groups suggests that even in the face of a pandemic, social distancing measures and allocation schemes may be challenging to implement and sustain due to strains on family resources and distrust of government.

Participants with differing viewpoints demonstrated a clear capacity for deliberating about difficult policy issues, listened to others' perspectives, and may have influenced others' positions. They addressed complex issues associated with the distribution of benefits and burdens associated with public health policies, as well as the need to balance demands for personal autonomy with community well-being. Opportunities such as these for public education and input in policy processes may be important to build trust and ensure compliance.

Contributions and Policy Implications

Taken together, the findings from these two studies suggest numerous implications for policy makers. First, both studies highlight the need to focus efforts on producing evidence of effectiveness in public health services and activities. Officials value the use of empirical evidence to support their allocation decisions, and policy makers certainly need such evidence to justify funding public health programs, yet

current effectiveness data is very limited. Policy makers must support expansion of effectiveness research, as well as translation and dissemination of that research, so that LHOs can improve the health status of communities by offering programs that work. LHOs rely heavily on past allocation schemes to guide future allocation decisions, and there is certainly some efficiency in that approach, but evidence of effectiveness is required to know whether past approaches to allocation are worth perpetuating. As an example from pandemic preparedness and response, the dearth of evidence on the effectiveness of social distancing measures, coupled with little public trust in government, could seriously undermine public health efforts to contain contagion in communities.

Similarly, our findings indicate that conducting needs assessments is not a part of most LHOs' current allocation decision processes. Such assessment is a core function of public health practice, and assessment data is vital for matching allocation decisions to community needs. Policy makers should, therefore also support and encourage the use of needs assessments prior to allocation decision making so that priority is given to populations or programs with the greatest needs.

Additionally, the ability of researchers to learn more about resource allocation and other aspects of the public health system depends on the availability of accurate and complete revenue and expenditure data from LHDs. Many LHDs currently do not have the capacity to accurately collect and report such data. Therefore, policy makers should also invest in developing and making available more effective, user-friendly data collection tools and accounting methods for LHDs. State health departments could play an important supportive role, since they are largely responsible for both the resources sent

directly from the state to LHDs, and for the federal resources passed through states to LHDs.

Our findings also suggest that LHOs' discretion may be influenced by factors beyond the mix of revenue sources. This finding offers a new perspective on the positive role that Boards of Health may play in assuring that LHDs have adequate and appropriate resources to address local community needs. Further studies should examine operational features of Boards of Health and further delineate aspects of the relationships between Boards of Health and LHOs that may affect revenues and programming.

The association we have identified between increased discretion in allocation decisions and increased capacity for meeting community public health needs is particularly intriguing, given that some LHOs suggest they could do more with the resources already in the system if they had more discretion. Further research should focus on developing an understanding of the ways that discretion is operationalized, and how factors that increase discretion may also influence the capacity for meeting community needs. For example, a future research question might be: are LHOs with higher discretion designing new programs or creating more successful partnerships with community providers than those with lower discretion?

Numerous potential policy implications arise from the findings of the focus group study described in Chapter 4. If our participants' concerns about the economic and emotional burdens associated with pandemic response plans are broadly shared, it may be difficult to implement and sustain social distancing measures in communities. Rigorous analysis of community experiences with the current H₁N₁ pandemic should inform future preparedness and response plans by weighing the benefits of containment measures

against the economic and emotional burdens they create. Contingency plans may be needed to manage the desire for religious support and the need for economic resources for vulnerable populations (e.g., the working poor with inadequate sick leave benefits and single parent families with young children).

Our participants clearly wanted accurate and consistent information and opportunities for input and discussion. Policy makers should not shy away from involving the public, particularly in value-laden decisions such as allocation plans for scarce resources during an emergency. Public deliberation about pandemic response or other pressing policy issues can create important venues for informing policy makers and LHOs about whether policies parallel community values and conceptions of fairness.

Many participants made public-spirited comments and suggested that they appreciated the complexity of allocation decisions. If the broader public also has this ability to engage in fairly sophisticated, nuanced discussions of complex issues, policy makers should consider that public input may be another significant source of information to assist them in making critical decisions. If engaging the public in dialogue can clarify community benefits, make allocation decisions more transparent, and offer policy makers meaningful information about diverse points of view, such engagement may go a long way toward improving pandemic response and other response plans. Public engagement may be particularly useful in helping LHDs to educate their communities, show transparency in policies and build trust when faced with scarcity of vital resources. Larger studies are necessary to develop more generalizable findings. Future research should also emphasize the development of standards for deliberation so that deliberative processes can be rigorously assessed for effectiveness.