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The Role of Agency in Community Health Outcomes: Local Health Departments and Childhood Immunization Coverage Rates

James Anthony Ransom

Antioch University - PhD Program in Leadership and Change

THE ROLE OF AGENCY IN COMMUNITY HEALTH OUTCOMES: LOCAL HEALTH DEPARTMENTS AND CHILDHOOD IMMUNIZATION COVERAGE RATES

JAMES RANSOM

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Approved by:

Philomena Essed, Ph.D., Chair	date
Carol Baron, Ph.D., Committee Member	date
Mitchell Kusy, Ph.D., Committee Member	date
Angela Snyder, Ph.D., MPH, External Reader	date

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Abstract

Organizational culture is defined as a system of shared meaning held by members of an organization that distinguishes it from other organizations. How organizational culture is experienced in the public sector, particularly local health departments (LHDs), is not well understood. The purpose of this study was to determine whether LHD organizational culture impacts childhood immunization coverage rates. I used a modified organizational culture survey tool, the Organizational Management Survey, to quantify organizational culture and determine whether an LHD's organizational culture helps explain variations in childhood immunization coverage rates. In addition, qualitative data from an earlier study of LHD immunization staff were used to enhance the quantitative results. I used factor analysis and hierarchical regression analyses to explore organizational and demographic factors associated with variations in community childhood immunization coverage rates. The factors included organizational culture, organizational leadership, type of LHD, agency size, jurisdiction type, and participation in an immunization coalition. Among the LHD immunization programs in the study sample, organizational culture and type of LHD were significant predictors of immunization rate variation. This two-item model explained 6% of the variation in vaccination coverage levels among the respondents. The other variables did not contribute significantly. This study identified key issues for better understanding how organizational culture functions in LHDs. This research provides information on the impact that organizational culture has on work method and outcomes. Some specific changes can take place or be implemented once this is understood.

Finally, this study underscores how important it is for local public health directors to measure and understand their organization's culture and performance before and after instituting changes to achieve measurable goals like immunization coverage rates. Policy implications, suggestions for improving organizational culture to enhance performance, and areas for future research are identified. The electronic version of this Dissertation is at OhioLink ETD Center, www.ohiolink.edu/etd

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Chapter I: Introduction

Problem Statement

Vaccines are among the most effective and cheapest tools for preventing disease and improving community health. Immunization service delivery has become a central platform of U.S. public health efforts. Despite the importance and ubiquity of vaccinations, there are stark geographical and socioeconomic differences in childhood immunization coverage rates in the United States. These differences have been documented for nearly two decades, but their predicates are poorly understood. Much of the past research about the causes of state- and local-level variations in childhood immunization coverage rates has concentrated on individual-level socio-demographic characteristics and families' interactions with primary care providers (Luman, Barker, McCauley, & Drews-Botsch, 2005). However, non-medical research gives evidence of agency (institutional) influences on community health outcomes (Emmons et al., 2000; Roussos & Fawcett, 2000).

The evolution of the numbers of recommended vaccines for children and adults is outlined in Appendix A, detailing how the number of vaccinations a child should receive before their third birthday has increased two-fold since 1980. The population of children who have to access these vaccines through public sector sources has also increased. Although public health departments have had to increase their immunization-related activities to meet the needs of these

changes, their immunization service delivery (ISD[1]) operating budgets have been relatively stagnant (National Association of County & City Health Officials [NACCHO], 2009).

Local jurisdictions struggle with addressing this public health challenge (improving childhood immunization coverage rates) with varied resource levels, different community attitudes, and different population groups within the community. These different communities and population groups hold a broad spectrum of attitudes, knowledge, levels of trust, and beliefs about the value of vaccines. An implicit challenge to governmental public health is to figure out ways to achieve both equity and excellence in their ISD responsibilities, despite resource and community demographic challenges. Community-specific attributes (e.g., poverty, rate of health insurance coverage, or geographic isolation that hinders access to a spectrum of social services) affect childhood immunization coverage rates, but agency aspects also likely have a significant impact.

Childhood immunization coverage rates are key indicators of the overall state of health and wellness for a community (Bryce, Arifee, & Pariyo, 2003; Newacheck, Stoddard, Hughes, & Pearl, 1998; Palfrey, 2006; Szilagyi et al., 2002). The persistent racial, ethnic, and socio-economic gaps in childhood immunization coverage rates are evidence that the people within health departments can have an understanding of the "vision" and "mission" of government services but often are on their own to figure out what it will take to carry out and implement that vision to achieve the "articulated" goals of vaccinating every medically eligible child in their

[1] The operational and logistical activities that assure the consistent delivery and uptake of recommended childhood vaccinations and the ongoing systemic monitoring and evaluation of their impacts on community health.

LHD's jurisdiction (Boin, T'hart, Stern, & Sundelius, 2005; Burns, 1978). This study examined how organizational culture and public health practice goals (as articulated in governmental public health's mission and vision[2]) interact to affect local health department (LHD) practices, as measured by a specific community health outcome, childhood immunization coverage rates.

For this study organizational culture was defined as a system of shared meaning held by members of an organization that distinguishes it from other organizations. This study's use of the concept of organizational culture consisted of a set of key characteristics that the organization values, and it is those characteristics that this study sought to quantify. The investigation of organizational culture within health departments is of particular interest because 1) it is a little-studied factor in community health outcomes, and 2) individual factors that may impact immunization coverage rates, e.g., race, income, and insurance coverage status, have been studied extensively. Study results will have implications for the future study of agency organizational behavior, design, and culture as it relates to public health departments and immunization service delivery.

For this research, and to be consistent with definitions found in the peer-reviewed literature, a local health department may be locally governed, part of a region or district health agency, be an administrative office or unit of the state health department, a hybrid of these types,

[2] Collaborating to create expertise, information, and tools that people and communities need to protect their health – through health promotion, prevention of disease, injury and disability, and preparedness for new health threats (Centers for Disease Control & Prevention, 2009).

or may be a stand-alone clinic or entity (such as a community health center) that functions on behalf of the LHD to deliver services.

The research question for this study is: Does local health department organizational culture help explain and contribute to the wide variations in U.S. childhood immunization coverage rates?

Background

The nation's 2880 LHDs serve as a logical population for gaining an understanding of organizational factors that affect childhood immunization coverage rates across the country (NACCHO, 2009). Two-thirds of the nation's LHDs are units of local government (NACCHO, 2009). These LHDs function within localities that have different organizational structures; therefore, each LHD has a great deal of freedom in how it interprets and implements immunization policy and organizes its ISD activities. It is these organizational and cultural variations that this research characterized to determine whether, and to what extent, those factors play a role in community childhood immunization coverage rates.

Since 1994, the Centers for Disease Control and Prevention (CDC), academic institutions, and other agencies have supported research efforts to measure local and state immunization coverage rates and describe, characterize, and explain the variations in those rates (McCauley et al., 2001). Although most vaccine doses (even those purchased with public funds) are delivered within private-provider offices, it is the health department that assures that vaccine doses connect with the populations of children who need them. More than any other public health activity, immunization service delivery pushes public health practitioners from their

remote role (as governmental workers) to the forefront of interacting with individuals, families, health care providers, schools, and other stakeholder groups in their communities. Public health departments provide a framework for community approaches to improving immunization service delivery, because immunization service delivery is more than just getting vaccines into doctors' offices—it is an entire system of quality assurance, program implementation, program management, program evaluation, and accountability (Ryman, Deitz, & Cairns, 2008). The frontline governmental agency to assure that this system works as it should is the LHD.

Local Health Departments (LHDs)

LHDs' jurisdictions cover nearly the entire country. In some jurisdictions, the LHD is the only source of care. The LHD is often the only organization singularly focused on the health of the entire population that has a mission to protect the entire public, prevent disease, and promote health by establishing the fundamental conditions necessary for health. Despite these facts, many federal, state, and local policy makers and agencies repeatedly fail to recognize the importance of LHDs' role in community well-being (Fielding & Freiden, 2004).

To alleviate the stress of resource and community demographic challenges to meet their immunization goals, public health practitioners have often turned to their local legislative structures to develop immunization-related school-entry mandates (T. Wilson, Fishbein, Ellis, & Edlavitch, 2005), additional programs for un- and underinsured children (Humiston & Good, 2000), multiple local insurance coverage schemes, provider and public education campaigns, and collaborations with school systems to conduct school-located clinics (Ransom, 2008). LHDs have tried various types of demonstrations—working with WIC [Women, Infants, and Children]

programs, preschools, PTAs [parent-teacher associations], health fairs, and community activities to find successful models of what works to connect children with the vaccines they need. The most prominent of these collaborations has been with WIC, because it was implemented nationally. WIC is a food and nutrition program that helps pregnant women and families with young children. WIC partners with other agencies that deliver social services that are key to childhood and family well-being, such as immunizations. As an adjunct to services that provide immunizations, the WIC Program's role is to find out about a child's need for immunizations and share that information with parents, including where to get a child immunized. Because immunization rates of low-income children continue to lag behind those of more affluent children, a White House Executive Memorandum was issued in December 2000 directing WIC to screen the immunization records of all infants and children under the age of two at WIC certification visits. Despite all these efforts, childhood immunization coverage rates have barely budged upward since the late 1990s . Trends of these immunization coverage rates from historical National Immunization Survey (NIS[3]) data are outlined in Appendix B.

Specific Aims of the Study

This study was a quantitative approach to answer the primary research question. The study included 1) results from a qualitative multi-LHD case study component of Antioch University's Ph.D. program in Leadership and Change (Ransom, 2008) and 2) a survey of LHD

[3] The National Immunization Survey (NIS) began in 1994 and is sponsored by the National Center for Immunizations and Respiratory Diseases (NCIRD) and conducted jointly by NCIRD and the National Center for Health Statistics (NCHS). The NIS is a list-assisted random-digit-dialing telephone survey followed by a mailed survey to children's immunization providers.

immunization program managers across the country to help characterize LHD immunization program organizational culture. As the U.S. moves toward more universal health care access and coverage, governmental public health will have an even more pressing mandate to help the most vulnerable children by reducing barriers to interventions like vaccines. Therefore, studying LHD organizational factors that may contribute to variations in this particular community health outcome was very timely.

Implementation of Immunization Services

LHDs implement public health programs in widely different ways and with varying rates of investments of state and local resources (Lee et al., 2007). From a policy perspective, the different ways of implementing immunization services is often a function of politics, because methods of implementation are predicated on budgetary decisions made by state legislatures and not by local boards of health. Local boards of health are administrative bodies whose functions, powers, and responsibilities vary from jurisdiction to jurisdiction. Each board is generally concerned with the recognition of the health needs of its community and the coordination of projects and resources to meet and identify those needs. Among the tasks of most boards of health are disease prevention, health education, and implementation of laws pertaining to health.

For immunization services delivered to pediatric populations, some states are universal purchase, meaning that the state legislature matches the federal contribution so that all children ≤18 years old in that state, irrespective of income or insurance coverage status, have access to free doses of recommended vaccines. Other states pick selected vaccines to provide to all children, and these states are known as universal-select states. Other states provide only the

Vaccines for Children (VFC) vaccines to VFC-eligible children and no other children. The VFC program is a federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated because of inability to pay. These states are known as VFC-only because they provide no matching state funds toward the purchase of other recommended vaccines. The impact that these systems of implementation have on childhood immunization coverage rates is relatively unknown because very little research has been conducted to determine if, and to what extent, they have on this particular outcome. Lee et al. (2007) conducted a qualitative study, interviewing state immunization program managers, which identified some association between universal access (children having access to all recommended vaccines irrespective of familial income and/or insurance status) and improved immunization coverage rates. Corroboration of those study results via quantitative analyses has not been conducted. Even within states that have universal purchase and distribution, there are significant variations in childhood immunization coverage rates (Olshen, Mahon, Wang, & Woods, 2007). The various implementation schemes described above are outlined in Table 1.1.

Table 1.1

Vaccine Financing Schemes, Public Health

	Type of Financing Scheme*				
	Universal	*Universal Select*	*VFC-Enhanced*	*VFC-Enhanced Select*	*VFC Only*
VFC-eligible children seen in public sector, private sector, FQHCs/RHCs	All	All	All	All	All
Underinsured children seen in public sector	All	All or some	All	All or some	All
Underinsured children seen in private sector	All	Some	All	Some	None
Insured children seen in private sector	All	Some	None	None	None

VFC – vaccines for children program; FQHC – federally qualified health center; RHC – rural health center.
**All, some, or no recommended vaccines purchased and distributed by state immunization program, using a combination of VFC funding, section 317 funding, and state funding.*

This research took into account the way the state makes provisions for childhood immunizations (e.g., universally or VFC-only), but I did not assume that this reflects LHD organizational culture, but rather that it reflects the larger political culture of the state and its localities, given that the decisions are made by legislators and not public health officials.

Importance of the Issue

Governmental public health has made great strides in delivering immunization services to children, but there are still large pockets of underimmunized children who continue to be

impacted by outbreaks of vaccine-preventable diseases. Public health researchers have noted that the measles resurgence from the late 1980s to the present is related to lagging immunization coverage rates among children (Kirschke et al., 2004; S. Ostroff, 2011).

Improving childhood coverage rates has remained problematic for public health departments since the measurement of childhood immunization coverage rates began in 1994 (Smith et al., 2001). NIS estimates from 2008 show that approximately 20% of children less than 3 years old remain underimmunized and thus vulnerable to VPDs.

Researchers have used NIS data to study the variations between states, select urban and rural areas, types of providers seeing the children, insurance coverage, and omnipresent racial, socioeconomic, and ethnic disparities (Chu, Barker, & Smith, 2004). However, social epidemiologists and health services researchers have now begun to examine how other factors contribute to the variations in coverage rates, such as a rise in home schooling (Thompson, 2007), growing community concerns about the safety of vaccine ingredients (Gust, Darling, Kennedy, & Schwartz, 2004; Gust et al., 2008), and an increase in the number of providers who openly defy the recommended Advisory Committee on Immunization Practices (ACIP) schedule (Mendelsohn, 1987; Sears, 2007). The ACIP is a committee of 15 immunization experts who advise the Secretary of the U.S. Department of Health & Human Services on the control and prevention of vaccine-preventable diseases. They develop written recommendations for the routine administration of vaccines to children and adults. The ACIP is the only entity in the federal government that makes such recommendations.

Immunization coverage rates are a metaphorical canary in a coal mine—if the public health system is failing to reach specific goals of vaccinating 90% of the nation's children (Healthy People, 2010, 2020),[4] public health practitioners have to ask a very important question: What else is going wrong in regard to delivering population-based preventive measures? Lower-than-expected childhood immunization coverage rates are a signal that the public health system should examine its processes of immunization service delivery implementation and identify the gaps in regard to how so many children remain un- and underimmunized and susceptible to life-threatening diseases. Self-examination of that magnitude has never occurred across the public health system.

The practical implication of that lack of self-examination is that the older the child becomes, the further removed from the well-child visit system s/he becomes, and the more difficult it becomes to reach the family until the child enters school (Schor, 2004). Well-child visits occur from birth to 35 months of age and are structured around the ACIP's recommended immunization schedule. In addition to vaccinations, the child's primary care provider assesses a child physically, behaviorally, developmentally, and emotionally. A well-child visit is a critical opportunity for a child's developmental delay or disability to be detected, which can lead to treatment and application of appropriate interventions. Therefore, figuring out predictors that

[4] Healthy People goals are science-based 10-year national objectives for promoting health and preventing disease. Since 1979, Healthy People has set and monitored national health objectives to meet a broad range of health needs, encourage collaborations across sectors, guide individuals toward making informed health decisions, and measure the impact of our prevention activity.

point to success of making sure that children are up to date by 35 months[5] of age is important because 1) inappropriately timed vaccinations can provide less protection; 2) timely vaccinations protect children and their contacts as early as possible; and 3) delayed or inappropriately timed vaccinations have economic, political, administrative, programmatic, and financial implications for public and private providers and society at large (Luman et al., 2005).

Governmental public health should take a closer examination of itself and figure out what role its local agencies play in community health outcomes overall, but in this outcome in particular, given that one of public health's essential primary functions is immunization service delivery (NACCHO, 2008). Other studies have examined the role of agency in immunization service delivery, but their foci have been limited to specific states (Ehresmann, White, & Hedberg, 1998; Freed, Clark, & Cowan, 2000; Haley, 1999), specific counties (Bennett et al., 1994), specific cities (Dominguez, 2004; Florin, 1993), health care providers (Hillman et al., 1999; Sinn, Morrow, & Finch, 1999), or specific antigens (Davis, Patel, & Gebremariam, 2004).

The above-mentioned studies show that there are multiple issues related to access, utilization, equity, and the ethics of vaccine administration delays (Pogge, 2005). Efforts to improve coverage rates have for too long focused on community socio-demographic factors to the exclusion of examining the public-private partnership and system of care that is charged with assuring delivery of recommended vaccines to children. These entities —federal, state and local

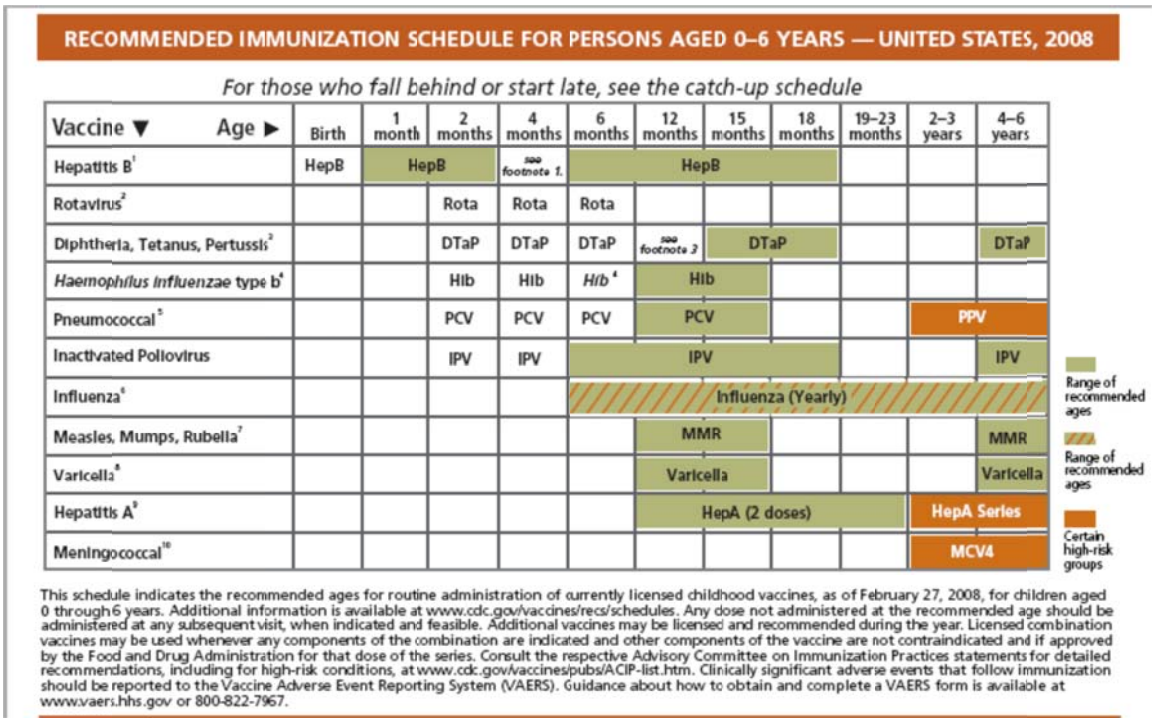
[5] The National Immunization Survey measures up-to-rate vaccination rates in children between the ages of 24 and 35 months. The Kindergarten retrospective survey looks at childrens' records when they enroll in school, to see if they were up to date by the age of 35 months.

public health agencies and private providers—are charged with dealing with the barriers that increase missed or delayed vaccination visits. Examination of organizational cultural factors of the agencies charged with delivering the services can provide useful information to inform and direct efforts to improve health departments, improve their service delivery capacities, and provide a process and a roadmap for these agencies to use to improve their practices.

Leadership

To achieve maximum improvements in community health outcomes, public health leaders, as with all leaders, must provide the vision and articulate the priorities for their organizations (Rost, 1991). However, the public health workforce that is responsible for honing and implementing public health's vision is oftentimes boxed into complex government bureaucracies, which can stymie efforts to implement the vision communicated by the leadership (Greenleaf, 1977; Robbins & DeCenzo, 2008).

A better understanding of the bureaucratic obstacles that impede implementation of the vision and mission of the LHD is important because public health departments have to manage local logistics of an increasingly crowded and complex schedule of recommended vaccinations (Ackerman, 2008; Figure 1), conduct more quality assessment visits to providers enrolled in the Vaccines for Children program, and sustain all the responsibilities that come with additional recommended vaccines, shrinking budgets, and a shrinking workforce (Beitsch, Grigg, Menachemi, & Brooks, 2006; NACCHO, 2009).



RECOMMENDED IMMUNIZATION SCHEDULE FOR PERSONS AGED 0–6 YEARS — UNITED STATES, 2008

For those who fall behind or start late, see the catch-up schedule

Vaccine ▼ Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B[1]	HepB	HepB		see footnote 1.	HepB						
Rotavirus[2]			Rota	Rota	Rota						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	see footnote 3	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	*Hib*[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPV	
Inactivated Poliovirus			IPV	IPV	IPV						IPV
Influenza[6]					Influenza (Yearly)						
Measles, Mumps, Rubella[7]						MMR					MMR
Varicella[8]						Varicella					Varicella
Hepatitis A[9]						HepA (2 doses)				HepA Series	
Meningococcal[10]										MCV4	

Range of recommended ages

Range of recommended ages

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of February 27, 2008, for children aged 0 through 6 years. Additional information is available at www.cdc.gov/vaccines/recs/schedules. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug Administration for that dose of the series. Consult the respective Advisory Committee on Immunization Practices statements for detailed recommendations, including for high-risk conditions, at www.cdc.gov/vaccines/pubs/ACIP-list.htm. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at www.vaers.hhs.gov or 800-822-7967.

Figure 1.1 2008 Schedule of recommended routine immunizations, 0-6 years of age.

These conditions combine to make immunization service delivery implementation tremendously uncertain and uneven and raise the stakes of local decision-making about implementation of existing and new vaccination recommendations. It is that minefield of key decision-making and actions that make effective and productive leadership absolutely critical for LHDs. The Advisory Committee on Immunization Practices' recommendations and guidelines are helpful, but they do not provide strategies on how to implement and exercise immunization service delivery judiciously.

Ongoing Interventions

Public health interventions and programs, such as VFC and the State Children's Health Insurance Plan (SCHIP), have varied in terms of their success in lowering the financial and access barriers to vaccines and other preventive health care services. SCHIP is an insurance program that provides comprehensive insurance coverage to uninsured poor children, with funding coming from both federal and state sources. The SCHIP program is administered by the Centers for Medicaid and Medicare Services (CMS[6]). VFC is a vaccine-supply program that binds providers, vaccine manufacturers, and governmental public health into a partnership to connect vaccines with un- and underinsured children. Providers enroll in the VFC program and access free doses of vaccine if they agree to see Medicaid-eligible children in their practices. VFC was developed to mitigate the financial and logistical barriers to vaccines by integrating the care of eligible children into medical home settings by giving providers a golden incentive—free doses of vaccines.

The free vaccine doses are the currency of trade between government public health and private providers. If providers agree to see Medicaid-eligible[7] and underinsured children in their practices, the government provides them with free doses of very costly vaccines, thus unburdening these providers from the tasks of placing orders with vaccine manufacturers and

[6] CMS is the Centers for Medicare & Medicaid Services. Formerly known as the Health Care Financing Administration (HCFA), it is the federal agency responsible for administering the Medicare, Medicaid, CHIP (Children's Health Insurance), HIPAA (Health Insurance Portability and Accountability Act), CLIA (Clinical Laboratory Improvement Amendments), and several other health-related programs.

[7] Medicaid is a public insurance program that provides care to qualifying people who cannot pay for their own medical expenses. Medicaid covers hospital stays, doctor visits, emergency room visits, prenatal care, prescription drugs, and other treatments. Medicaid is jointly funded by both the federal government and each individual state.

putting out tens of thousands of dollars up front for doses of vaccine that may not be used up with their privately insured patients. By enrolling in the VFC program, providers do not have to put out any funds and are not stuck with unused doses of vaccine because they can return unused doses to the health department. This achieves two key goals: 1) provides more coordinated primary care for uninsured and underinsured children and 2) incentivizes primary care providers to become vaccination advocates because it relieves them of the financial burden of purchasing expensive doses of vaccine that may go unused. Although helpful, VFC and SCHIP still fall short of helping the nation achieve the goal it set for itself with the Healthy People objective of fully vaccinating up to 90% of children before their third birthday.

After an initial leap in coverage rates when it began in 1994, VFC has had a mixed bag of success in improving immunization coverage rates and integrating children into medical homes (Allred,Wooten, & Kong, 2007; Rosenthal et al., 2004; Santoli, Rodewald, Maes, Battaglia, & Coronado, 1999; Smith, Jain, Stevenson, Mannikko, & Molinari, 2009). Therefore, something else needs to occur to assure that the goal of VFC is applied more evenly and its benefits are shared across all pediatric population groups more equally.

Working Definitions

Throughout this dissertation, multiple terms and concepts with multiple meanings are used. I have provided the definitions that I applied to my research throughout the processes of investigation, data collection, data analysis, and results reporting.

Childhood immunization coverage rates: The national childhood immunization coverage average for 2008, per NIS data, was 78.2% of children between 12 and 35 months of age up to date for 4:3:1:3:3 series of vaccinations.

Up-to-date immunizations: The NIS measures a specific cadre of vaccinations to determine whether a child is up to date. The numbers that are frequently quoted are 4:3:1:3:3. These numbers translate to 4 doses of diphtheria-tetanus-acellular pertussis (DtaP), 3 doses of inactivated polio vaccine (IPV), 1 dose of measles-mumps-rubella (MMR), 3 doses of haemophilus influenzae vaccine (Hib), and 3 doses of hepatitis B vaccine (HBV).

Governmental public health: The U.S.'s public health system is a decentralized network of federal, state, and local agencies. There are multiple federal public health centers, under the umbrella of the Department of Health and Human Services. The most granular components of this system are LHDs, which are responsible for applying public health policies and creating and maintaining conditions that keep people healthy. Locally, the governmental public health presence can take many forms. Each community has a unique public health system cobbled together as individuals and public and private entities and other stakeholders who are engaged in activities that affect the public's health. Regardless of its governance or structure, regardless of where specific authorities are vested or where particular services (e.g., restaurant, daycare, and nursing home inspections) are delivered, everyone, no matter where they live, expects the LHD to provide certain services to the community (R. Pestronk, personal communication, April, 2009).

Underinsured: Children who have private health insurance but the coverage does not include vaccines or covers only selected vaccines. It also includes children whose insurance plan caps vaccine coverage at a certain amount, and once that coverage amount is reached the additional costs of vaccination are not covered or reimbursed. Underinsured children are eligible to receive VFC vaccines only through a Federally Qualified Health Center (FQHC[8]) or Rural Health Clinic (RHC[9]).

*Uninsured***:** A child who has no public or private health insurance coverage.

Knowledge Gaps

There is scant evidence on the value of measuring organizational culture within LHDs, despite the need for concrete guidance on specific internal practice changes that can contribute to improved service delivery. Measuring and characterizing LHD organizational factors provide a profile of specific success and failure elements so as to make prescriptive recommendations for organizational changes as public health moves forward with ever-increasing immunization requirements to implement (Groom, Kennedy, Evans, & Fasano, 2010; Schneider, Brief, Guzzo, & Organ, 1996; Shefer et al., 2006;).

An understanding of how organizational culture impacts community health outcomes is an important aspect of transforming public health practice and thus the public health system's

[8] FQHC is a federal designation from CMS that is assigned to private non-profit or public health care organizations that serve predominantly uninsured or medically underserved populations. FQHCs are also called Community/Migrant Health Centers (C/MHC), Community Health Centers (CHC), and 330 Funded Clinics (source: Texas Association of Community Health Centers).

[9] An RHC is a clinic certified to receive special Medicare and Medicaid reimbursement. The purpose of the RHC program is to improve access to primary care services in underserved rural areas.

infrastructure (Rowitz, 2003). Knowledge derived from an analysis of aspects of organizational culture can help fill gaps in understanding the ways that an LHD depends on leadership to shape its culture and how that culture contributes to quality of ISD in a community (Kotter & Cohen, 2002, p. 116). This study helps establish an empirical basis for evaluating "how" culture operates in LHDs that can inform internal planning and practice to improve a specific health outcome.

Although organizational culture measurement tools have been used in health care settings (Flin, 2007; Hofstede, 1990; T. Scott, Mannion, Davies, & Marshall, 2003), their use in public health departments has been very limited. Health departments have less structural flexibility than private sector organizations, which dominate the health care entity studies and writings on organization theory and organizational culture as it relates to health care. This study examined the utility of characterizing organizational culture within an LHD because there is a documented need for governmental public health to analyze its infrastructure (Institute of Medicine [IOM], 2003).

Theoretical Framework

The theoretical framework that guided this research is a synthesis of public health, leadership, management, public policy, and organizational psychology concepts. There is evidence that organizational culture is an important factor in health outcomes, and some theorists suggest that culture is one of the most critical issues for instituting organization change. Specific cultural attributes of an organization may be responsible for that organization's performance. For health departments, that performance measure is specific health outcomes, like childhood immunization coverage rates.

This research explored the theories and ideas proposed by Eng and Young(1992), Rosenthal et al. (2004), Dietz et al. (1994), and Rudner Lugo (1993) for understanding immunization policies, resources, and management practices of LHDs; Greenleaf (1977), Rowitz (2003), and Rost (1991) for understanding the concept of leadership as it relates to public service agencies; Schein (2004), Morgan (1997a, 1997b), Argyis (2001), and others for conceptualizing organizational culture and its essential elements; Lupton (1995), Peterson (1997), Hofrichter (2004), and others on the intersections of society, government, politics, and public health practice; Cohen, Gabriel, and Terrell (2002) on staff diversity within public health agencies and impact on health outcomes; and Boin et al. (2005) for understanding crisis management and public leadership. Key concepts related to all of these public health, leadership, change, and organizational classifications are discussed in greater detail in Chapter II.

Personal Relevance and Positioning

My work experiences in a national organization dedicated to advocating on behalf of local public health practice piqued my interest in how the U.S. public health system functions in terms of delivering statute-mandated services. Insight I have gathered over the past 22 years of working at the federal, state, and local levels of governmental public health influenced my decision to conduct an organizational examination of that very same system.

I had three key advantages of being an insider-researcher: 1) a greater understanding of the agency culture being studied; 2) not altering the flow of small-group interaction during the qualitative components of the study; and 3) an established intimacy with public health practitioners that promotes honesty and transparency. Although I had professional familiarity

with the participants, I did not have regular professional contact with them. Therefore, I carried out the research as an insider with the sense that I was not an integral part of their particular immunization programs. I did not have an intimate knowledge of how immunization service delivery operated in their jurisdiction, just a broad general idea of local-level service delivery.

There are limitations and disadvantages to being an insider-researcher, too. Some research points to notions that insider-researchers can become myopic because they take things for granted, or assume that they "know" certain things. Hawkins (1990) noted that the insider-researcher struggles to make the familiar strange and struggles to objectify what he or she is seeing or hearing. Those were some of the issues I struggled with as I conducted the study. As a long-time public health practitioner, I have my notions of "right" and "wrong" and good and bad practices. To protect against those forces coming into major play, I worked with two colleagues to develop all instruments, to conduct all interviews, and to review the survey instrument. The goal of this collaboration was to help reduce my bias as an insider-researcher (Hill et al., 2005).

Some of the literature discounts the feelings I had, as well as the opinions of others who wrote about limitations to insider-researcher status. Beoku-Betts (1994), Reay (1995), and Riessman (1987) wrote that because the researcher shares certain aspects with the individuals being researched it does not make the data any richer or any thinner. These authors wrote that individuals within a particular group will not share exactly the same perceptions and interpretations.

It seems to me that the advantages of being an insider-researcher outweigh the disadvantages. I did not have to "learn on the fly" about aspects of local public health practice

(because I have worked within three health departments), immunization service delivery (an issue I've worked on for 17 years), and I had access to privileged information that I could exploit for research purposes. A quote by Hannabus (2000, p.13) sums up the insider-researcher dilemma succinctly:

> The [insider] researcher knows his / her environment well, knows by instinct what can be done and how far old friendships and favours can be pressed, just when and where to meet up for interviews, what the power structures and the moral mazes and subtexts of the company are and so what taboos to avoid, what shibboleths to mumble and bureaucrats to placate.

My work and personal experiences as someone who has worked within and on behalf of LHDs helped me better understand some of the key operational challenges and concepts that inhibit or enhance practice and service delivery. I had a front-row seat as an employee and an advocate on many of the training, guidance, and cultural issues that need to be examined within public health practice. These work experiences helped me be a much more reflective practitioner and researcher and to develop my personal vision and "aha" moments. These experiences helped me be a better researcher for this particular study because I shared their vision of what immunizations mean for public health and for the overall health of the public.

My public health work experiences in countries with fewer resources than the U.S., particularly in tuberculosis (TB) prevention and control, educated me to the shortcomings of the U.S. public health system. I realized that the U.S. does not have a "system" per se, but rather a hodge-podge of very different 'sub-systems' functioning in very different ways, based on resources, populations served, and the local political culture where the health department is

located (Schein, 2004). TB prevalence, like childhood immunization coverage rates, is a "canary in the coal mine" measure. Public health has a mixed bag of success in controlling TB's spread and re-emergence as a health threat (Binder, Levitt, Sacks, & Hughes, 1999; Fidler, 2004; Morens, Folkers, & Fauci, 2004). Public health science has developed very effective diagnostic tests and antibiotics to control TB, yet TB remains a huge public health burden throughout the world. Public health is no closer to controlling its spread than it was 50 years ago (Raviglione, 2008). Public health's ongoing struggle to control and prevent TB is a signal of the regression of public health practice—a signal of where public health practitioners are in terms of being prepared for the challenges of the 21st century.

Public health practitioners, and their organizations, have examined and researched how external factors (e.g., ethnicity, poverty) impact community health outcomes. With "reform" being a popular political mantra since 2008, now is the time to ask the fundamental questions of where public health practitioners are failing within the system, which touches on re-defining government's role in population health. Public health practitioners must evaluate themselves to determine why it is failing to meet many of its goals if its true goal is health equity. An examination and characterization of public health's organizational cultures is a means to help conduct such an evaluation.

Methodology

This research involved intensive data collection efforts and a detailed analysis of the dynamics of ISD at the local level. There were two activities that were conducted during my

Antioch University individual learning achievement (ILA) requirements that helped prepare me for this dissertation research:

1. Compiling and re-analyzing key informant data about immunization service delivery and local practices to improve coverage rates; and
2. Using the key informant data to help shape the qualitative questions that were part of the online survey.

The quantitative portion was a survey of LHD immunization program managers that used an existing organizational culture measurement, the organization and management survey (Organizational Management Survey), as a template to develop a survey specifically designed to gauge opinions and perspectives of LHD immunization program managers and to obtain basic information about LHD organization culture, leadership and management styles, policies, and practices.

Six other key activities were part of the process of completing my dissertation research. These included:

1. Compiling community descriptive data for the LHDs included in the study;
2. Linking and aggregating existing LHD descriptive and immunization coverage rate data files for the analyses;
3. Developing and disseminating an LHD-adapted and modified version of Organizational Management Survey;
4. Collecting and cleaning the survey data;
5. Bridging selected NACCHO Profile LHD descriptive data with the survey data; and

6. Conducting factor analyses and hierarchical regression analyses on the survey data.

Immunization coverage rates for these LHDs were from the U.S.'s standardized immunization coverage rate data sets: 1) the published retrospective data LHDs have to submit from their kindergarten retrospective surveys (KRSs) (Appendix C) and 2) the 2008 NIS data on 15 specific localities (Appendix D).

Organization of the Dissertation

The dissertation is organized into five chapters. Chapter I provides an introduction to the topic under study, covering essential information about ISD, organizational culture, public health practice, and the importance of improving childhood immunization coverage rates. The study's overall theoretical perspective and a review of relevant literature is covered in Chapter II, explores the specific influences of organization culture, leadership styles, and management practices on immunization coverage rate variations.

The study design and methods of analysis is described in Chapter III, which also provides descriptions of the tools, analyses, results of the pilot qualitative study (key informant interviews) that informed the research question for this dissertation, and the factor and regression analyses results. Chapter IV reviews the data collected and the subsequent analyses. Chapter V provides discussion of the results and conclusions. Survey instruments and other documents are presented in the Appendices.

Chapter II: Literature Review

Introduction

This chapter discusses the literature related to organizational theory and the internal organizational cultural factors of LHDs that may enable staff within those agencies to exercise their ISD activities in ways that influence and improve community childhood immunization coverage rates. This research examines the spectrum of LHD immunization programs to quantify how organizational culture within the LHD contributes to the variations in childhood immunization coverage rates. The literature referenced for this study was retrieved from multiple academic and scientific databases, using key word and subject matter searches. For this specific research project, search topics included but were not limited to: organizational culture, public health, health departments, immunization services, leadership, organizational change, organization theory, immunization registries, immunization surveys, pediatric immunization coverage rates, public health infrastructure, measures of organizational culture, participatory research and planning, and public health performance standards.

This chapter reviews a diverse array of literature to explore the various elements that constitute governmental immunization service delivery, governmental public health's goals of social justice, health equity, and community engagement; and how elements of an LHD's organizational culture may affect community childhood immunization coverage rates. To accomplish this, I turned to the available literature on organizational culture and transadapted the definitions and elements, which were written from the perspective of profit-making entities, to apply to LHDs, which are units of local or state governments.

Within public health departments of all sizes, there is an urgent need to address lagging childhood immunization coverage rates (Luman et al., 2005). Some of this urgency is appropriately attributable to external factors such as local, state, and national politics and budgeting; funding streams earmarked for specific public health activities such as emergency preparedness planning, overall decreases in public health funding, modified health care regulations, and introduction of new vaccines and recommendations without adequate funding to implement those new recommendations (Brooks, Beitsch, Street, & Chukmaitov, 2009; Lee et al., 2007). Less well recognized and studied is the contribution of internal health department factors. Compared to the external factors, the internal factors likely have a more direct and immediate impact on immunization rates and are likely to be very changeable at the local agency level (Fairbrother, 2000).

Organizational theory maintains that there is no single optimal organizational design for all conditions (Hatch & Cunliffe, 2006). However, there may be a set of elements of specific LHD organizational structures that can be identified to help improve performance (Seid et al., 2007), such as levels of accountability and commitment to the community. The success of immunization service delivery and accountability of public health departments to the communities they serve are predicated on resources and management issues, as noted by Eng and Young (1992). However, even in the absence of disruptions in the financial and material areas of immunization service delivery, local leadership and management have great impact on the ability of children to have access to the recommended doses of vaccine (Fassoula, 2004; Sinn et al., 1999)—small changes can result in dramatically different behavior at both the individual worker

and organizational levels (Mallinger, 1998). Stanley, Meyer, and Topolnytsky (2005) suggest that autonomy and pushing down decision-making throughout the organization are related to public health performance. Any changes in leadership and organizational culture will interact with changes in other networks, such as organizational social networks and knowledge networks (also referred to as silos or communities of practice), to affect overall organizational performance (Sawyer & Rosenbaum, 2000).

My inspection of the internal machinations of an LHD required using research methods of disciplines such as social and organizational psychology and industrial engineering (Schwab, 2005). Nudging LHDs to reflect on themselves (what they do and how they do it) can have a ripple effect in terms of LHDs stopping to re-assess and think about their work, their processes, and how they interact with and impact the communities they serve (Hofrichter, 2004; Krieger, 2000). The real-world practical activities that can emerge from an individual LHD reflecting on its impact on its community can be as straightforward as acknowledging that there are many people within public health departments who do not have opportunities to talk across areas of practice or get to think about issues outside of their particular areas of expertise (Leischow & Milstein, 2006; Levy & Sidel, 2006; Potter, Ley, Fertman, Eggleston, & Duman, 2003).

Building effective partnerships with communities is recognized as an important strategy to improve service delivery (Eng & Parker, 1994). However, there is limited empirical research on how strongly organizational culture impacts performance of real organizations, largely due to the difficulty of collecting data, and possibly due to an

assumption that public health agencies have similar cultures across the country (Association of State and Territorial Health Officials [ASTHO], 2009b; Council of State and Territorial Epidemiologists [CSTE], 2009; NACCHO, 2005, 2009).

Organizational Theory

Ideas and theories on what constitutes the elements of an organization have fluctuated throughout the 19th and 20th centuries. A key element that distinguishes organizations from other groupings of people is a commitment to achieving some specific goal via specific processes (Starbuck, 1965). The concept, theory, and make-up of the organization in modern society (i.e., industrialized) have been explored by social scientists, industrial engineers, historians, philosophers, and economists (Cummings & Worley, 2005; Hatch & Cunliffe, 2006).

Emile Durkheim wrote that organizations arose as the result of society transitioning from agrarian to industrial modes of subsistence. Durkheim asserted the concept of a commitment-maximizing organization that became a central source of moral influence and authority as society industrialized and became increasingly socially complex (Lincoln & Kalleberg, 1990). Durkheim thought of culture as a function of emotional arousal, ritualistic performance, and a force of social solidarity (Lincoln & Guillot, 2004; Turner, 1975). The organization became a manifestation of where a person saw his/her "place" in society. People within organizations began to see themselves as part of a community and thus would identify deeply with the organization's goals (Lincoln & Kalleberg, 1990).

Further into the 20th century, German sociologist Max Weber (1947) referred to organizations as bureaucracies—due to the rising professionalization of organizations. Weber

saw bureaucracy as a way to rationalize the social environment. He wedded rationality to the concept of consciousness—that those who participate in the organization cannot be rational without being aware and sensitive to the humans affected by the actions of the organization. Weber also wrote that rationalization within bureaucracies without conscious consideration [of the people within those organizations] leads to an "iron cage" capable of imprisoning humanity and making man a "cog in an ever-moving mechanism" (Hatch & Cunliffe, 2006). Unlike Weber, Durkheim did not seem to see organizations as full of conflict (e.g., the degree of worker attachment or sense of 'belonging' within the 'community') but as a source of moral authority, value-ranking, and meaning-making for those affiliated with, as well as those affected by, the organization (Lincoln & Kalleberg, 1990).

The U.S. public health system has a complex division of labor between federal, state, regional, and local public health agencies. It has ideologies that are codified in policies and procedures, rules and regulations, and specific public health statutes (Hodge, Garcia, Anderson, & Kaufman, 2009; Hunt, 2004). The public health system fits into Weber's notion of the rational, i.e., legal, framework of functionality. The overall structure and culture of the most granular part of the public health system, the LHD, determines how the system performs community by community. Therefore, the speed, accuracy, and quality of LHD decision-making impacts outputs and outcomes much more directly than decision-making and acting at the federal and state levels.

Durkeim (1997) and Weber (1947) viewed the development of the organization as an outgrowth of the human condition, because humans are social beings. Their relational views on

organization theory suggest that the organization's culture arises and becomes defined via a series of interactions between individuals (Weick, 1979). After the emergence of their relational views of the organization, a systems view emerged. This systems perspective saw the organization evolving from a means of survival and subsistence to existing for the output of goods and services to accommodate the increasing complexity of social interactions and human organizing (Miller, 1958; Senge, 1994; Wheatley & Keller-Rogers, 1996).

Organizational theory progressed in the 20th century from the transition phase articulated by Durkheim (agrarian to industrial) and the rational administrative approach of Weber (evolution from simple system to byzantine bureaucracy) to views more aligned with social psychology and human behavior that encompass various influences on the behavior of organizations as living entities made up of individuals who function, interact, and work within them (Capra, 1996; Wheatley & Keller-Rogers, 1996). Durkheim, Weber, and other thinkers on organization theory focused on goals, objectives, tasks, roles, responsibilities, and alignment of actions with vision. Their focus seemed to be on the organization as an organic part of the human experience—the organization arose as a function of survival and a means of subsistence, a construct to define and exercise our values and give our lives meaning and direction, in addition to helping meet basic human needs of food and shelter.

Relational and systems views of organizations were combined to give a broader definition of the organization (Dyer & Singh, 1998)—a collection of agents who interact to produce some *thing*. The concept of a "collection of agents" impacting an "output" resulting from interactions is critical to my specific research interest. In public health practice, these

outputs are specific community-focused interventions such as screening programs, environmental assessments, and immunization services. The systems and relational views are relevant for LHD immunization programs because 1) LHD immunization programs are embedded in governmental and community systems and need to align organizational culture with community culture and community values and 2) they have to evolve to meet the ever-changing health needs of the people external to the organization, i.e., the community.

Organizational Culture

The organizational culture aspects of health departments were important to study because organizations, as outlined in the previous section, influence the individuals who work within them by patterning their perceptions, thoughts, feelings, expectations, and behaviors (Suchman, 2001). According to theorists ranging from Weber (1948) to Schein (1985), organizational culture is stable, socially constructed, and subconscious (Cameron & Quinn, 2006; Hofstede, 1990; Schein, 1985; Shortell, 1988; Siehl & Martin, 1984).

The anthropologist Ruth Benedict (1989) wrote of the power of the individual to imprint their perceptions on the larger system, which adds organization to cultural life. Benedict wrote that the organization comes about through the unconscious workings of human experiences in day-to-day living, regardless of the organizational platform the individual is connected to (tribe, village, town, government agency, or company). She wrote that "no individual can even arrive at the threshold of his potentialities without a culture in which he participates." It is this nod to perceptions, values, beliefs, and attitudes that tie Benedict's anthropological conceptualization of

culture to many of the writings of those focused on defining and describing culture in narrower settings, such as how culture functions within organizations.

For Schein (1985), culture is a pattern of shared basic assumptions learned by a group as it works through its problems and challenges. The success of working through past problems and challenges lays the groundwork for modeling what employees will turn into a practice standard—past successes serve as templates for future decisions, actions, and activities. The employees solved problems in a way that worked well enough to be considered valid and, therefore, use those examples to teach new members as the correct ways to perceive, think, and feel in relation to those problems (Schein, 1985, p. 17). The part of Schein's study of culture most relevant to public health is that "if an occupation involves an intense period of education and apprenticeship, there will certainly be a shared learning of attitudes, norms, and values that eventually will be become taken-for-granted assumptions for the members of those occupations" (p. 20).

Although Schein very much influenced the study of organizational culture as a concept, many others have presented somewhat different views on what constitutes organizational culture. Cameron and Quinn (1999) view the culture of an organization as embodied in its language and symbols, leadership styles, procedures and routines and definitions of success. Culture is a synthesis of perspectives, values, assumptions, and artifacts (Boggs, 2004). Pettigrew (1979) defines organizational culture as a process of creating beliefs, symbols, and myths that becomes the creator and manager of meaning (p. 572). Culture becomes "the system of publicly and collectively accepted meanings operating in a given group at a given time" (p. 574). Pettigrew

also wrote that employees must have an ongoing sense of the "less rational and instrumental, the more expressive social tissue around them that gives those tasks meaning" (p. 574). The workers (i.e., followers) within the organizations must understand the point, as well as the value, of their tasks.

For Deal and Kennedy (1982, 1983, 1999), culture is "the integrated pattern of human behavior that includes thought, speech, action and artifacts" and relies on the human ability to learn and transmit these patterns to future employees (1999, p.4). Deal and Kennedy maintain that beliefs and values are the center of an organization's culture and that organizational rituals (routine activities) and ceremonies (celebrations and awards) are really nothing more than culture in action (Boggs, 2004). Their perspective corroborates Wheatley's (Whatley & Keller-Rogers, 1996) notion that organizations are living and replicating systems. It is the replication of the organization's culture that makes it a living entity. Culture becomes the DNA of the organization. Like DNA, there are processes of replication necessary within an organization (the organism) to achieve a specific goal.

Public Health Practice, Leadership, and Role in the Community

A primary responsibility of leaders is to create and maintain the organizational characteristics that reward and encourage collective effort, i.e., encourage all followers to toe the line. The concepts of obedience, conformity, defiance, and followership (Foucault, 1997; Hogan & Kaiser, 2005; Kellerman, 2008) within organizations are important to understanding LHDs and their interactions with the communities they serve. Because LHDs are units of government, there are specific protocols, levels of

bureaucracy, and performance standards employees are expected to follow, thus governing how and when they can interact with the public.

As mentioned in Chapter I, VFC and the SCHIP, in theory, provide more access to vaccines for children in low-income, underinsured, and uninsured families. Because childhood immunization coverage rates vary so much from state to state, within states, and within local jurisdictions, public health must look at the systemic factors that contribute to these variations. Multiple studies have examined community indicators, individual family indicators, and provider factors (Brenner, 2002; Szilagyi et al., 2002; Williams, 1990, 1995, 1998), but few have examined the internal health department factors that may contribute to, mitigate, or exacerbate the problem of disparate childhood immunization coverage rates. Health departments are key partners in the success of the VFC and SCHIP programs, but also are the partners least examined in terms of what they contribute to the success or failure of improving childhood community immunization coverage rates.

There has to be a level of internal LHD leadership to execute all the elements involved in delivering immunizations to children (Brownson, Baker, Leet, & Gillespie, 2003). Of course not all of the thousands of people employed within LHD immunization programs will step up to the challenge of radically changing the practice of ISD. Some of the barriers and opportunities that will prevent them from being, or encourage them to be, proactive in implementing change within their agencies are reflective of those individuals, but other barriers and opportunities are more organizational and reflective of

the culture in which the workers must act (Leana & Van, 1999). The individual factors that prevent employees from being proactive include the fact that many of the them are so steeped in traditional academic learning or obedient to what has been done in the past (Foucault, 1997; Kellerman, 2008; Schein, 2004;) that they have little room for new learning and innovative maneuvering within their agencies. Normative thinking, within a public health construct, means following a medical model—those with the medical, nursing, public health law, or public health professional degrees will do the thinking and the planning at the exclusion of those within the LHD who are not credentialed in those areas (Prentice, 2007). Those staff members within the public health system who are not so steeped in the academic/medical model of public health are probably the biggest and best resources for connecting to communities (A. Iton, personal communication, 2006), and the individuals within those communities, to affect organizational change (Acker, 1990; Schwarz, 2002) that can improve community health outcomes.

Engaging the full spectrum of its employees is important for an LHD because public health is one of the last governmental domains in which authorities explicitly strive to shape community social experience and social interactions in ways that influence the behaviors of, and choices made by, individuals (McLean, 2008). Even the language used that is considered acceptable to describe the LHD's community are manifestations of the LHD's culture—whether they view the populations as "at-risk" or "marginalized" is telling of the culture and the approach of the LHD toward its constituents. These concepts and perspectives are very reflective of the power relations between the LHD and

the community, indicating whether the community is seen as full of individuals who can think and act and advocate for themselves (McLean, 1996) and work in equal partnership with the LHD.

Public Health Leadership

Everyone in the LHD—particularly its leadership—can help assure a healthy organizational culture by paying attention to communication, relationships, team members, and making concrete specific policies, practices, and behaviors (Mitchell & Shortell, 2000; Suchman, 2001). Anand, Peter, & Sen (2004) noted that improvements in public health measures such as sanitation, nutrition, and immunization have greatly impacted and improved population health. However, these improvements have not been equitably distributed across population groups. Social epidemiologists (Berkman & Kawachi, 2000) build on this notion regarding the interdisciplinary nature of health equity and the role that leadership plays in the actions and decisions of health departments.

Schein asserts that organizational leaders hold and transmit the culture, and as such, are in the position to manage and actually change an organization's culture. Kellerman (2008) expanded on this theme and wrote that the workers (i.e., followers) in the organization will be obedient and follow what is transmitted by the leader, noting that the leaders must have followers who pick up that "transmission," pass it along, translate it into actions, and apply it to the day-to-day functioning of the organization, thus creating and/or sustaining the organization's culture. Kellerman went on to write about the importance of followers in acting out the wishes of the leader, noting that only under the right circumstances will even a few followers muster up the

courage to defy the authority of leadership (p. 17)—to break ranks and break out of the organization's cultural patterns.

Public health systems must change so that coverage rates on the lower end of the spectrum can be seen and understood as systems failures and social justice challenges—thus helping create a culture that interprets poor outcomes like low childhood immunization coverage rates as inexcusable and unacceptable (Handler, 2001; Iton, 2009). The tone of the leadership and what is articulated by the leadership go a long way toward mitigating worker resistance to practice improvement. By taking steps beyond a classic hierarchical leadership-only decision-making model, LHDs can focus on the horizontal internal organizational changes necessary to make the necessary internal changes that can influence and improve health outcomes in the community (Bloodgood & Morrow, 2003).

Leadership is the glue for the organization and sets the tone and the standards. Without that crucial ingredient, the group can become lost and disoriented (Hesse, 1956). Greenleaf wrote that leadership is an inner quality as well as specific actions and authorities exercised by those in power (1977, p. 65). Boin et al. (2005) wrote that too many public service organizations are not designed to look for trouble (e.g., ethical lapses or disconnects between stated and achieved goals) within their own ranks. This charge is applicable to LHDs, because many states' and localities' immunization coverage rates are very low, which in itself is a public health crisis and failure of leadership.

Leadership and Organizational Change

Effective leadership is critical in terms of shaping organizational culture, and changes in leadership and organizational culture have powerful consequences for organizational performance (Carley, 2002). Multiple public health leadership institutes have cropped up in the past decade (Koh & Jacobson, 2009), but it is not this type of drop-in training that is needed for successful leadership and stewardship of local public health. Public health has to figure out a way to model its leadership for the new normal[10] and turn its departments into centers of continuous learning and rapid evaluation, adoption, adaptation, and application of new technologies (Kusy & Marr, 1991). Several public health thinkers have offered ideas about the leadership and change that the system will need to transform itself. Their ideas draw from business, economics, medicine, and others to identify key organizational steps that will have to be taken.

Public health leadership has to break away from a 'command and control' hierarchy (Figure 2.1) to one of consultation and collaboration (Figure 2.2) with the community—and to focus on its development and empowerment (Iton, 2009). Public health leaders have to develop and market the vision so that staff will be motivated to implement a new paradigm of public health practitioner skills, develop effective teams across silos, and assist community partners in

[10] New normal refers to a state of perceived insecurity that entered the public consciousness after the terrorist attacks in the U.S. on September 11, 2001. With a laserlike focus on the identification and containment of dangerous individuals through detailed information surveillance techniques and the patrol of national borders, the ideology of the 'new normal' has become hegemonic in its influence on all sectors of government. This type of orientation has significant implications for public health, especially during times of social duress such as those experienced during a disease outbreak (Hooker & Ali, 2008).

developing strategies and behaviors to deal more effectively with collectively addressing health inequities (Iton, 2009). A tremendous amount of local leadership is needed to shift the foci and modify public health practice to uncover the substrates that fuel the poor health outcomes they witness day after day in the specific populations they serve (Fawcett et al., 1995; Hofrichter, 2004; Kaufman, 1959).

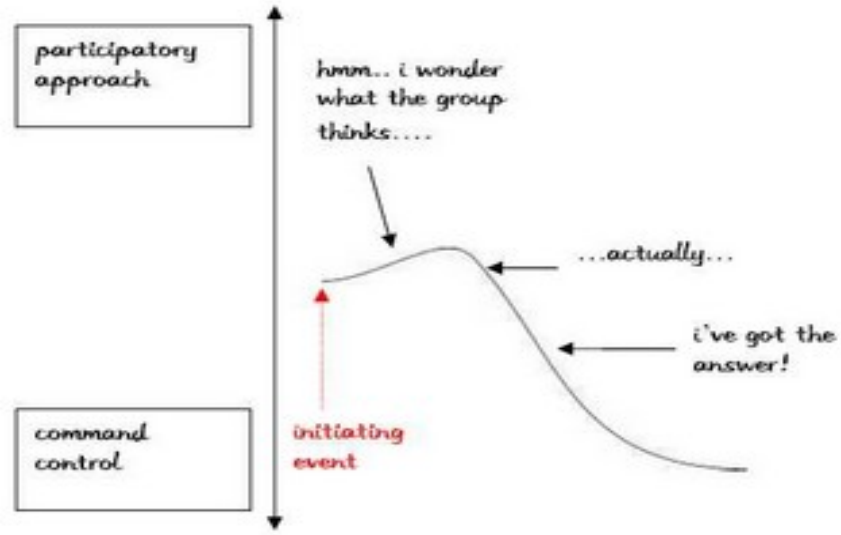


Figure 2.1 Command, top-down approach to leadership and change.

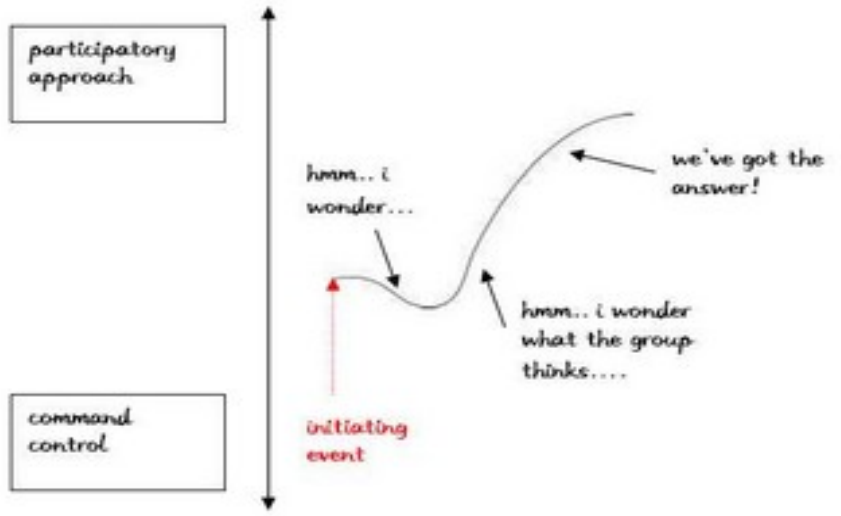


Figure 2.2 Participatory approach to leadership and change.

Rowitz (2003) wrote that "local and state public health leaders must work together to protect the health of all citizens regardless of race, gender, ethnicity, or socioeconomic status" (p. 7). Rowitz also wrote that everyone must be treated equally by public health practitioners. Multiple demographic studies demonstrate that communities are not equal, people do not live on a level playing field, and therefore communities cannot be treated in the same way (Hofrichter, 2004; Kreiger, 1994; Levy & Sidel, 2006). It is incumbent upon public health leadership to take this inequality into consideration when applying interventions, particularly when it comes to children and vaccines (Koenig, Bishai, & Khan, 2001; Victora et al., 2003; Whitehead, 1991). Greenleaf (1977) noted that in the public and private sectors, leaders are judged by the outcomes of their behaviors. He also wrote that good intentions do not relieve those who cause harm from both legal and public condemnation. This is where the reflection by public health practitioners

and their organizations becomes critically important. If they do not reflect, then the usual behaviors become the patterns that lead to the exact same poor and mediocre health outcomes in the community.

Recognizing that local public health systems have to be transformed, public health leaders should focus on trying to transform practice (internal machinations) and not zero in on going directly at solutions to less-than-optimal childhood immunization coverage rates. The leadership should focus on changing agency practices so that the practices begin to work toward solutions to the community's lingering problems (Prentice, 2008). By focusing on the practices, the organization therefore changes the culture that new employees walk into and begin to function. Multiple leadership thinkers note that leaders have to learn as they go (Heifetz & Laurie, 1997; Vaill, 1996). Given the ever-evolving nature of governmental public health and the challenges they have to respond to and manage public health leaders definitely have to continually learn and adapt to new situations (Rosen, 1958). Vaill (1996) wrote about organizations being in permanent white water. Vaill's concept of permanent white water is applicable to the "new normal" of public health practice in the 21st century. Public health organizations must master processes of collective reflection to navigate the white water successfully.

Because a sick-care model (focusing on treatment after illness occurs instead of focusing on preventing the illness in the first place) of practice still dominates in health departments, too many of them are structured so that only a few non-clinical "leaders" emerge. When only a few people have access to such authority, power, and skills, you limit the scope of leadership and

how problems in the community can be solved (Couto, 2002; Greenleaf, 1977; Lomas, 1998). Broadly distributed leadership opportunities give employees the chance to not just work in their usual disciplines but to work and create the vision of their LHD to actually address health outcomes inequities (Mayrowetz, Murphy, Louis, & Smylie, 2007). These expanded efforts for leadership to grow and be expressed build the organization's competence and sustains the ability for creation of innovative decision-makers (Bennis, 2003, p. 73). This effort aligns with the belief that the reflective and learning organization focuses on teasing out the wisdom that exists in their vast array of employees (Heifetz, 1994; Vaill, 1990). Leadership is not achieved by sending employees to a training institute but is cultivated through internal outreach and providing leadership and learning opportunities to everyone within the organization. Others have mentioned that by not doing these kinds of activities (opening up planning and strategic thinking activities to everyone), the organization will clone itself and replicate its functional and dysfunctional practices, which in turn become internal issues of equity and access (Essed & Goldberg, 2002; Griffith, Childs, & Jeffries, 2007).

The biological sciences' concept of cloning is a useful model to examine how repetitive cultural practices within organizations become issues of equity. Cloning shuts out diversity and change, often with disastrous outcomes. As with biology, cloning replicates the errors and mistakes of the host DNA and magnifies it overtime to the point that it becomes deleterious to the organism's survival. The same applies to social organisms – the errors and mistakes magnify because diversity is never introduced; no one else is allowed to exercise leadership, challenge the status quo, or introduce innovation. Using the sciences to describe organizations as organisms is

reflected in the writings of Wheatley and Keller-Rogers (1996), Rycroft and Kash (2004), and Schneider and Somers (2006).

Building on the concept of the U.S. public health system as a unique social organism, Koh and Jacobson (2009) and others mention that public health leadership is special and different from other forms of leadership because public health officials' responsibilities are enormous in scale and play out in the public eye and impact a much broader array of stakeholders. Every citizen is a stakeholder. Every citizen has a say in what public health officials do and how they do it, not just a privately selected and appointed board of directors. Public health officials have to grapple with harmonizing local ordinances with state and federal requirements. This means that for public health leaders, passion and vision are not enough. These leaders remain in what Peter Vaill (1996) refers to as "permanent white water." Vaill mentions that organizations are in a time where events are ever-surprising, messy, costly, and unpreventable. That characterization sums up public health's 21st century challenges. The events outlined earlier (SARS, pandemic influenza, terrorism-related public health measures) have taken public health leaders out of their comfort zones and demanded that they do things seemingly unrelated to public health practice (e.g., liaise with state and national political leadership and address issues of social inequity). The leaders must understand that they must continuously evolve and that their LHDs must become learning organizations (Senge, Scharmer, Jaworski, & Flowers, 2005). The key to their agency's adaptation is vertical and horizontal leadership—not just coming from the top, which has been popular orthodoxy for many years (Bennis, 2003).

Chapter III: Methodology

Overview

This chapter presents the research methods that were used in the study, describes the research design, discusses the survey participants and survey instruments, and explains the rationale for the particular research approach. This study integrated methods of organizational psychology, health services research, epidemiology, demography, sociology, leadership development, and anthropology to construct a clearer and more robust picture of the role of agency in the documented variations in immunization coverage rates.

Current data on the relationship between LHDs and immunization coverage rates focus on measures such as funding streams to specific LHD programs, numbers of FTEs [full-time employees] within the LHD, frequency of immunization clinics sponsored by the LHD, frequency of assessments of VFC providers in the community, and other tangible measures (Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005; Shefer et al., 1999; Smith et al., 2009; Szilagyi et al., 2002). This study built on those efforts and focused on the research needed to determine whether and how aspects of organizational culture factors contribute to the "how" these activities are implemented and the connection to variations in state and local immunization coverage rates. This study provided more detailed contexts of the organizational leadership and management data on LHD immunization programs. Such information can help LHDs identify opportunities for practice improvements, improving their connections to their communities, identifying functional and organizational barriers to better ISD, connecting isolated silos of

practice within their LHD, and prioritizing areas for improving aspects of their LHD's culture and, ultimately, performance in a specific criterion: childhood immunization coverage rates.

Research in a Changing Public Health Landscape

Unprecedented investments and developments in new vaccines have catalyzed rapid changes in immunization service delivery and redefined how governmental public health and private-sector health care deliver recommended vaccines to children less than 3 years old. However, the potential for these advanced developments and interventions to prevent a wider range of infectious and chronic diseases will only be realized within a system that develops appropriate strategies for the appropriate use and timely uptake of these new and improved vaccines (Cutts, Orenstein, & Bernier, 1992; Maciosek, Edwards, & Coffield, 2006; Margolis et al., 2001).

This study focused on the governmental public health organization, the individuals within the organization, and a contextual focus on their internal social, political, and economic environments.

Introduction to and Rationale for Research Design Strategy

Governmental public health plays a critical role in delivering vaccines to children less than three years old, because more than half (56%) of this population receives ACIP-recommended vaccines purchased with public funds (IOM, 2003). Given the documented variations in immunization coverage rates of recommended vaccines in this age group, it is critical to broaden the examination of the factors that contribute to these variations. An intensive review of multiple facets—public health funding, outreach and education to providers and the

public, provider enrollment in VFC, evolving epidemiology of the diseases, evolving demographics of communities, rates of insurance coverage, ease of access to preventive care, economic decision making by vaccine manufacturers, interactions of all levels of governmental public health, health care providers, and insurers. It is critical to identify the predicates to the variations in childhood immunization coverage rates. Most of these variables have been studied repeatedly, as noted in Chapter I. However, this research focused on an under-examined facet—the role that LHD organizational culture plays in variations in childhood immunization coverage rates. Because LHDs are units of government, organizational improvement efforts are often focused on compliance improvement, which minimizes input and feedback from frontline staff. For ISD improvements to happen, LHDs must be viewed through an organizational lens. The IOM (2003) called for increased recognition of the complex and adaptive nature of health-related entities. That particular IOM report referred to these complex healthcare organizations as being constellations of diverse stakeholders made up of health departments, hospitals, community health centers, large provider practices, and everyday people.

To understand what LHD immunization programs need to do to improve coverage rates, critical characteristics of the immunization program must be understood. These characteristics include what organizational theorists refer to as organizational culture. These theorists also suggest that these cultural characteristics must be considered in concert to be able to create a concrete and comprehensive picture for the development of action steps the organization can take to improve its performance.

As part of this doctoral program, I completed an Independent Learning Achievement (ILA) that was connected to the dissertation research I wanted to perform. I completed key informant interviews with select LHDs to determine what role they "felt" their organization's culture played in affecting their community's childhood immunization coverage rates. The key informant interview guide is included as Appendix E. The key informants suggested that I: 1) conduct a larger survey to find out what other LHDs were doing to improve coverage rates and 2) collect the information and share it with NACCHO so that they could develop a toolbox for them to use. The key message was that information on what others are doing and doing successfully can help them transform their practices, attitudes, and perspectives on what they can do to improve their communities' health outcomes.

Overview of Qualitative Study

The research question for my dissertation grew out of this 2008 qualitative ILA study (Ransom, 2008). The LHD immunization programs served as case studies to provide in-depth qualitative insight into some of the LHD organizational factors underlying ISD performance challenges and successes related to childhood immunization coverage rates in their communities. The case studies were conducted in a convenience sample of 17 geographically and demographically diverse LHDs, predicated on each LHD's childhood immunization coverage rates per data from the national immunization survey and/or kindergarten retrospective survey results. (See Table 3.1.) NACCHO staff selected LHDs with high (>80% up to date [UTD]), moderate (>75% UTD but <80% UTD), and consistently low (<75% UTD) coverage rates. We

relied on National Immunization Survey[11] (NIS) data for those jurisdictions that were urban immunization action plans (IAPs) and local data sources for those who had never been oversampled as part of the NIS.

All immunization staff members (*n*=112 total immunization staff interviewed) at each LHD were included in the group interviews per a standard semi-structured interview script developed by NACCHO staff. LHD immunization program artifacts were also collected for inclusion in the analysis. Content and thematic analyses of transcripts and artifacts data were conducted.

The qualitative study results were used to help shape the survey questions and the focus of this research. My goal was to use this method to create a kaleidoscope—something more than just a snap shot—of local immunization programs—a collection of data, experiences, artifacts, and observations that together might offer some insight into the reasons for the mixed results of local coverage rates—although these local programs are working toward a shared goal and implementing many of the same immunization activities. Burt (2005, p. 73) referred to anecdotal evidence to support his theoretical models. He wrote that. "Evidence on adaptive implementation is primarily in the form of anecdotes, in part because the processes by which people bridge structural holes are so varied and sensitive to context." The qualitative component allowed me to include more vivid depictions of people's lived experiences within their health

[11] The NIS began in 1994 and is sponsored by the National Center for Immunizations and Respiratory Diseases (NCIRD) at the Centers for Disease Control & Prevention. The NIS is a list-assisted random-digit-dialing telephone survey followed by a mailed survey to children's immunization providers.

departments, efforts they took to improve childhood immunization coverage rates in their communities, organizational barriers or resources that helped or prevented them from doing activities, and reflections on all the topics asked about in the survey.

Table 3.1

Case Study Sites

Site	Region	Type of Jurisdiction	Type of LHD	Population Size of LHD Jurisdiction* (rounded)	Coverage Rate Classification (2002 – 2004)	Source	# People Interviewed at LHD
LHD1	Mid-Atlantic	Urban-Suburban	County	400,000	Moderate	KRS	11
LHD2	Northwest	Urban	City-county	2 million	Moderate	NIS, KRS	9
LHD3	West	Urban-Suburban	County	2 million	High	NIS	4
LHD4	West	Urban	District	2 million	Low	KRS	7
LHD5	West	Urban	County	1.5 million	Moderate	KRS	5
LHD6	Midwest	Urban-suburban	County	2.5 million	Low	KRS	6
LHD7	Southeast	Urban	City-county	2 million	Moderate	NIS	7
LHD8	West	Urban	City	700,000	Moderate	KRS	8
LHD9	West	Urban	City	500,000	Low	KRS	7
LHD10	Midwest	Urban	City	600,000	Low	KRS, NIS	4
LHD11	West	Urban-suburban	Multi-county	1 million	Low	KRS	3
LHD12	Northeast	Urban	County	700,000	Moderate	KRS	9
LHD13	West	Urban	County	9 million	High	NIS	7
LHD14	West	Rural	County	200,000	Low	KRS	6
LHD15	Midwest	Urban	City	3 million	Moderate	NIS	4
LHD16	Northeast	Urban	City	600,000	High	NIS	8
LHD17	South	Urban	City	2 million	Low	NIS	7

**Based on U.S. Census Data, 2000.*
LHD, Local Health Department.
NIS, National Immunization Survey.
KRS, Kindergarten Retrospective Survey.

The interviews were transcribed and uploaded to NVIVO for content analysis. The analysis searched for repeating key words, themes, and phrases to see if the LHDs' reports about their efforts to improve coverage were converging in a specific direction. The data were coded through a simple process of key word and phrase searches using NVIVO software. This first wave of analysis allowed us to break up, separate, and disassemble hundreds of pages of data into manageable pieces that we could later sort and categorize. We did not engage in intensive data coding, as we did not think it was the most appropriate strategy for the types of data we collected. This process of analysis (limited data coding) fit with our goals of 1) making sense of data generated from each case study; 2) identifying patterns and relations within each case study and then across all LHD case studies; and 3) making general discoveries about the phenomena (organizational factors) we were researching. After identifying the key pieces through the key word and phrase searches, we engaged in micro-level work by looking at detailed passages (those that contained the key words and phrases) over and over again—applying thorough analysis on these pieces to discern the interviewee's meanings (Seidel, 1998). We went through all the interviews and looked for these key items. These key items were sorted into two dimensions: success elements, which helped improve or sustain good immunization coverage rates; and challenge elements, which seemed to be associated with low or declining coverage rates. These success and challenge elements seem to be integral parts of the culture of the particular LHD immunization programs. The qualitative findings are outlined in Table 3.2.

Table 3.2

Emergent Dimensions and Themes

	Dimensions	
	Challenge	**Success**
Key Factors		
Leadership & organizational alignment	Agency leadership is top-down, with minimal input from staff for decision-making ISD is not in sync or aligned with other LHD programs focused on child health and well-being	Agency leadership is participatory and inclusive of staff opinions and perspectives ISD is aligned with other child-health-focused programs
Resources	Limited innovative efforts to identify and leverage various and/or new streams of revenue to expand and enhance ISD with the LHD	Organizational efforts to leverage various streams of revenue (e.g., preparedness funding) to expand and enhance child health programs, especially immunizations
Politics	Limited and/or adversarial relationship with local political leadership	Strong relationship with local political leadership (e.g., commissioners, boards of health) that is leveraged to help improve flow of resources
Community engagement/coalitions & partnerships	Weak external partnerships, coalitions, and community engagement efforts; minimal relationships with community stakeholders	Active immunization and/or health coalitions, agency requires community health assessments
Credibility	Uncertainty of credibility and trust community has in the LHD and its programs	Agency focus on sustaining credibility with various community groups and trust with a spectrum of community partners and stakeholders
LHD perspectives on its community	Limited cultural competency and cultural humility of staff; limited LHD infrastructure for supporting focus on staff development and growth in cultural humility and cultural competency; limited activities focused on health equity	Cultural competency integrated into staff training; immunization efforts considered part of agency's health equity efforts.

ISD, immunization service delivery.
LHD, local health department.

Results. After analyzing the content of the transcripts from the in-depth interviews and the materials the programs gave us, five top key concepts related to leadership, credibility, community engagement and partnerships, politics, and resources emerged.

Leadership. Among all the LHDs, leadership was the most crucial aspect to improving childhood immunization coverage in their community—this leadership extended from the health department, to the community, to schools, and partners such as hospitals and providers. Respondents viewed effective internal leadership as a key component to shape and guide public health's visions and actions. Those LHD immunization programs with better coverage rates stated that exercising leadership at every level was a means to promote agency psychological empowerment—a belief that each worker in the program had the ability to influence a larger system of which they are a part of (the community). One LHD, which had a shift in agency leadership, noted the impact that new leadership had on staff morale.

> [H]e came [here] with a whole new vision, which was really nice. [W]e were very, very siloed with our previous director. [He] is big on immunizations and immunization rates and not missing opportunities, and looking for ways to make the best use of what we're doing, because we've done a lot of stuff with WIC. I mean we had done some when he got here, but he really encouraged them and we've done a lot more. Every year we pick one WIC office and do a random selection of days, and try to get 80% of the records of the kids scheduled on those days, and look at their actual rate and see how they're doing. (Immunization Nurse Manager, western urban LHD)

What was most evident in LHDs with weaker coverage rates was that they often articulated words associated with powerlessness—an inability to change the cards that they had been dealt in regard to funding, staffing, and local political support for immunization initiatives.

> [We] are having a problem with [the] third dose. They are trying everything. They cannot locate most of the babies and moms. The numbers are very low compared to

> previous years. Serological testing for infants is very low and has dropped from 80% to 60%. (Immunization Program Manager, western metro-urban LHD)

The LHDs with better coverage rates, in addition to articulating words associated with "action" also reported that they felt like "champions." These staff reported that they led efforts to control, modify, and challenge these external forces so that they could sustain their coverage rates. These staff members articulated in the interviews a clear connection between their actions and the health of children in their communities.

> And so [there] have been obstacles and challenges for sure. But at the point where they say it's up to us, we can make the schedule, decide about the delivery, packing the clinics in the bag, getting them out there, doing a schedule of who's [going to] work at those clinics.

Credibility. The LHD immunization staff members were acutely concerned about their agency's credibility and its ability to work within the community. Immunization programmatic staff members are tremendously concerned about their agency's credibility with the public. The data showed that staff in the LHDs feel that the challenges they face, such as parental hesitancy regarding the safety of vaccine ingredients, are eroding that credibility. Those we interviewed articulated the importance of multiple levels of leadership—from their health officials, to their political leaders, as well as the leadership exercised by those they partner with—providers, entities like birthing hospitals, and community health centers. They also listed the importance of that broad concept of 'resources'—mentioning local and state staff reductions, retiring workers, and new work demands that do not come with funds attached.

Trust is the linchpin for many of their programs, and they fretted over any disruptions to that (Eisenman et al., 2004). They were not only concerned with their credibility with individuals

and families in the community, but also with their partner organizations. All LHDs, irrespective of coverage rates, communicated that they were greatly concerned that their agency be viewed as accessible to the public and a good place to get help or answers or information that they and their families need. The interviewees mentioned that even one bad experience can have a much more lasting impression on the community than thousands of good experiences.

> Well, we did some outreach to hospitals about birth dose of hepatitis B. We actually came up to the barrier that some of them thought that it would impact their accreditation if they had standing orders, that the Joint Commission wouldn't allow it.
>
> So it's just this perception out there—and we actually went to the Joint Commission person and their answer was just as confusing as where we started with. So there is the misconception out there that that's an acceptable practice. (Immunization Program Manager, southern multi-county urban LHD)

Community engagement/coalitions and partnerships. Among those with better coverage rates, the interviewees emphasized strengthening and keeping strong their ties to the community, engaging the community in decision-making and program implementation, and pulling partners together into health-related coalitions. Those LHDs with better coverage rates articulated a clear connection between how their agency is organized and how it works and how it interacts with its external environment—community members, schools, providers, and other partners. These LHDs also communicated that their internal subunits and subsystems continually interact because they recognize that they are mutually dependent on one another for their work to be successful. There was some difference between larger and smaller LHDs, with smaller LHDs noting that they had smaller staff numbers and less bureaucracy to wade through to get things done.

> Staff wanted to know which communities needed the most help and has conducted door-to-door cluster surveys in the past, but couldn't do that for the whole city. They started using public school data for kindergarten students. We identified 12 community areas that are primarily African American. The data collected are retroactive and they're looking at rates when 2 years of age instead of when they are entering kindergarten. This past year [we] tried to focus on those 12 communities to see if intensified efforts would help close the [coverage] gap. (Immunization Medical Director, Midwestern urban LHD)

> The high rates are also because a combination of other activities: media campaigns, school trainings, working with providers, doing assessments, providing [technical assistance], [medical assistant] trainings, and satellite trainings. Everything happens simultaneously. They also have nice multi-lingual materials. Their IZ campaign is constant and non-stop, going all year. They are planning on doing workshops with schools. They are going down to the nitty-gritty details that need to be addressed to increase rates. There are 33 school districts and they are going to be working with the people checking records. (Health Officer, Northeastern LHD)

> I mean, the first [community] meeting that I went into, there was so much yelling and fingerpointing—oh, it was awful. The District Attorney was there. Things were said. I mean, after a lot of the yelling got done, I think in the last year or so, we've really turned it around. Everybody's agreed that there's things we have to do. We're going to follow statute. We are going to work together. We've seen these large increases in our compliance rates and the number of kids that meet the minimum requirements. (Immunization Manager, Midwestern urban LHD)

LHDs have to have partners, but the strength of those partnerships are along a continuum—some are much stronger than others. Those LHDs with strategic and robust partnerships (evidenced by having regular meetings, standing and operating joint health and immunization coalitions were doing a much better job of collaborating to improve coverage rates.

> There should have been more public education about [the immunization program]—but the budget was limited so those resources were earmarked for educating the WIC staff. There should have been more focus on educating the management at each WIC-Health Center site. More communication was needed with the sites, and [t]he partnerships could have been stronger. There was a need to get someone on site to "own" the project. (Immunization staff member, southern urban LHD)

All LHDs articulated that community partnerships were part of their agency's mission. They all mentioned that part of their job of health promotion was to create and sustain effective community partnerships. They recognized that much of what they are tasked with doing by statute could not be done without the help and collaboration of community partners, particularly providers, community health centers, schools, and other entities that interact with families and children. A difference in their responses occurred when discussing how to overcome specific barriers to form, sustain, and strengthen partnerships and ties throughout the community. Those with better coverage rates doubled-down on their partnerships and developed effective coalitions to make sure that they obviated barriers. The coalitions provided forums for all partners to air issues and come up with solutions.

> They have worked a lot with providers and on getting them trained. Zero to two is still the most difficult population to get to because they are not in school and some not in day care. (Immunization nurse manager, northwestern city-county LHD)

> [We have] a hospital-based Maternal/Infant Education Program. [We] visit new mothers in the hospital. [Health department] clerks do the visits. They have a gift bag. They pass out information on immunization and WIC, and some other issues. The importance of getting your child immunized and when they should get immunized. Many parents believe the doctor will take care of it and will let them know what to do. They are informed that they need to know as much as their doctor with regard to their child's immunization requirements. This program helped the parents become informed consumers. (Immunization nurse, southeastern multi-county urban LHD)

However, the most important partner that the immunization staff of LHDs with high coverage rates mentioned was their colleagues in other divisions within the LHD. This increased internal collaboration was predicated on effective agency-wide communication and provided a means of vertical and horizontal sensitization of all agency staff, irrespective of division

affiliation. These efforts helped improve agency communication and enhance line staff and leadership awareness of community health issues and increased staff roles and contributions to decision-making and development and implementation of specific activities.

> One reason for high rates might be that the units under the [community health] program really work collaboratively. They have merged everything into one program and work closely with the community. (Immunization manager, Western urban LHD)

Politics. Data from the interviews of LHDs with high coverage rates showed that maintaining good relationships with local political structures were key elements to success. Staff noted that the absence of strong relationships with politicians and policy makers would hamper their ability to address inequities and lobby for special projects or increased funding.

> Actually it was the legislature. It's state money that finally got reinstated when [we were] at [number] 50 [of 50 states] two years in a row [for NIS], and then there's always that time line. So we've probably had—this is probably the third year we're applying for it, and it's to do something with a partnership of some kind or to do something in an office that's not your own, or try to be creative with what you're doing. We were actually allowed to use it to help fund our fire station [pediatric vaccination] clinic. (Immunization program manager, western LHD)

> [B]ecause the mayor has taken such a big interest in making sure kids are properly immunized for school, we've done clinics, we've tracked our costs. (Immunization medical director, urban Midwestern LHD)

From the data, it seems that those programs with better political support, which seems predicated on better community engagement, and more robust investments of local sources of funds, had better coverage rates. This local fiscal investment allowed them a measure of flexibility to exercise certain innovative and creative concepts. There were exceptions to this, but it was a dominant interconnected concept across the board—those reporting stronger community

engagement, robust community partnerships, and stronger coalitions—reported sustained local funding streams and thus did a better job of figuring out ways to improve coverage rates.

Resources. The amount of LHD resources dedicated to immunization programs fall along a wide spectrum, usually predicated on the size of the LHD and its jurisdiction's population profile. The LHDs focused on the changing resources landscape that they have to build their immunization program on. However, those with less successful coverage rates focused on what they did not have, with minimal discussion on solutions to those changes.

> The problem with VFC is that the 2 VFC coordinators cannot handle the number of providers out there. Pediatric up-to-date rates are only 40% for VFC, based on AFIX[12] numbers. (Immunization nurse, western, urban district LHD)

> We went from over 400 staff and well over 100 public health nurses to now, we have 250 staff and, I don't know, maybe 30 district nurses or something like that. (Immunization program manager, western, urban district LHD)

> But if you look at public health funding in the [state] as a whole, state funding for public health, we're 50th. Federal funding for public health, we're 50th. (Immunization nurse, western, suburban LHD)

Those with better coverage rates changed and adapted with the changing landscape and figured out ways to sustain good coverage rates—and talked at length about what they have tried.

> One of the things we've done through a taskforce that is between the health department, [the] public schools, and the district attorney's office, and the State Division of Public Health, we've gotten [the schools] to finally actually comply with the school immunization law. So they're doing a better job with that now. When a parent is faced with a letter of exclusion, it's sometimes easier for them to just check the philosophical exemption box than it is to go and get shots. [W]hen we've looked at records and looked

[12] AFIX is a quality improvement strategy to raise immunization coverage levels and improve standards of practices at the provider level. The acronym for this four-part dynamic strategy stands for assessment, feedback, incentives, and exchange.

> at the schools and talked to parents, they're not anti-vaccine. (Immunization manager, urban Midwestern LHD)

This factor emerged as a key success factor—staff members were focused on "change" instead of focusing on means of shutting down how proposed solutions would not work in practice. The data generated from these successful LHDs can help develop guidance on how to move practice groups or teams from negatively focusing on barriers to positively creating solutions and improving community health outcomes.

Community demographic attributes, attitudes, and perceptions. Notions of cultural practices of racial and ethnic populations weighed on specific immunization programs and practices within the health departments. While it was an issue for all LHDs, specific community demographic attributes were seen as barriers to service delivery for many of the LHDs included in the study. The statements provided by staff members show that public health organizations are rooted in systemic inequities, as are other institutions. Consequently, it may be that these notions, grounded in the staff members' experiences of interaction with specific communities, may function as processes of reproducing the very marginalization they are committed to addressing and correcting. For many of those interviewed, they noted the pressure to change practices and programs to accommodate the dramatic changes in the characteristics of the clientele accessing LHD immunization services, and the strain placed on staff resources, skills, and the structures of the LHD. Many of the comments made by interviewed staff members show the need for building staff capacity around cultural competency, cultural humility, and understanding how bias affects decision-making (Hunt, 2004). The starting point for such an

approach would not be an examination of the community's belief systems or cultural practices. The starting point should be consideration by public health practitioners of the assumptions and beliefs that may be embedded in their own understandings and goals in how they encounter and interact with the community members. Training and cultural competency, with its emphasis on promoting the understanding of the "cultural" community, seems to have neglected study and consideration of the practitioners' worldview.

> In Asian and Hispanic cultures, you don't go to the doctor unless you are sick, so it is hard to convince them to get vaccinated or to bring their children in to the clinics.
>
> One problem is that the population moves in and out of insurance coverage, and [in areas with better coverage] income distribution may have something to do with high rates. (Immunization program manager, Midwestern urban LHD)
>
> Childhood practices—the ones discussed before, have been successful—but we are still struggling with the barriers. We need to educate the public. Some minorities are leery about vaccines. There is a wide disparity in the rates. (Immunization program manager, Midwestern urban LHD)
>
> The parents [here] are go-getters for information, which may not be the case in all counties. [We] have large disparate populations. In the Hispanic culture, you do exactly what your doctor says and you follow their directions, so their rates are dependent on private providers. (Immunization program manager, northern California urban LHD)

Applying norms from one's own cultural practices can cause tensions when the "others" are expected to behave and think and act as "we" do within our own cultures. If staff do not have time and flexibility to work with cultures as needed, it is hard to work in a way that values and leverages cultural differences instead of seeing them as a barrier.

Quantitative Study Instrument

Based on the results of the qualitative study—and the multiple dimensions of how staff within local immunization programs experience service delivery—I decided to use the Organizational Management Survey for the quantitative portion of the research because of the practical aspects of its dimensions. I decided to use it as a template to develop a survey to help characterize organizational culture within local immunization programs and to describe how their basic assumptions and values manifest in immunization coverage rates in their communities. The Organizational Management Survey has been validated as an evaluation tool in various types of organizations. The framework has been used by Scott-Cawiezell et al. (2004) to assess organizational cultural types in nursing homes; by Singer (2003) to evaluate the relationship between organizational culture and the quality of work life in hospitals; and by Gifford, Zammuto, & Goodman (2002) to create a survey to determine nurse-retention factors.

The Organizational Management Survey is closely related to the most commonly used organizational culture instrument, the Competing Values Framework (CVF) (Quinn & Rorhbaugh, 1981), but it was modified by Shortell, Rousseau, Gillies, Devers, & Simons (1991) to increase its relevance to healthcare organizations. Scott-Cawiezell et al. (2004) took this modification one step further and modified it to be relevant for nursing homes and providing reflections on leadership and organizational cultures in those settings. The CVF was developed by researchers at the University of Michigan as a cultural assessment tool to help businesses identify major indicators of effective organizational performance. The tool focused on measuring teamwork, collaboration, talent management, empowerment, and inter-personal relationships.

These items were used to put organizations into 4 distinct dimensions: flexible, focused, internal, or external. Vogelsmeier (2008) also demonstrated the validity of using the Organizational Management Survey to differentiate organizations based on their culture when she studied variations in patient outcomes in nursing homes.

The characterization of health department organizational culture will help describe how immunization program managers' basic assumptions, understandings, application of knowledge, and values manifest in immunization coverage rates in their communities. In addition to examining the explicit structures such as LHD funding streams, staff size, and leadership structures, the quantitative analysis identified which organizational culture factors seem to matter most in predicting community childhood immunization coverage rates.

Study Population

The potential study population for the survey consisted of the immunization program managers at the 2880 LHDs that were a part of the NACCHO Profile Survey (2008).[13] Although each LHD does not have a functioning immunization program, each LHD has some measure of responsibility for ISD. For those LHDs whose primary immunization service delivery responsibilities are handled by a community health center, a visiting nurses association, a local board of health, or another community-based organization that has functions and responsibilities comparable to the LHD, the survey instructions requested that the survey link be forwarded to

[13] NACCHO's *National Profile of Local Health Departments* is the most reliable and comprehensive description of LHDs' infrastructure and practice. It contains the most comprehensive information, facts and figures about LHDs' services, financing, workforce, organization, and more. The full report is available on the Web at: http://www.naccho.org/topics/infrastructure/profile/resources/2008reports/index.cfm.

that entity for completion of the survey.[14] The database of the nation's LHDs (e-mail addresses of health officials and immunization program managers) is held by NACCHO. I had access to this database as a former employee of NACCHO and abided by NACCHO's guidelines for external use of the database. Before launching the survey, I sent a letter of introduction to the health official (Appendix D) to let them know what the survey was about, which data were to be collected, that I would contact their agency's immunization program manager, and how the data would be used. The letter to the health official was a matter of courtesy—to inform them of what was being requested of their staff members—and a matter of motivation, to garner the support of LHD leadership so as to encourage the immunization program manager to participate and respond to the survey. The primary contact for the survey, within each LHD, was the immunization program manager, the immunization nurse manager, or whoever else had primary management responsibilities within the program.

Of the nearly 3,000 LHDs, according to the profile results, 92% of them deliver immunization services (NACCHO, 2008). Bounce-backs due to wrong e-mail addresses, notices that the immunization program was not currently staffed, and LHDs or other agencies that do not

[14] For previous surveys I sent to LHDs, I had success in asking that if the LHD did not perform a specific function, that they pass it on to the appropriate local entity to fill it out. The survey provides instructions that if the LHD passes on the link to the appropriate local agency, to reply to me via e-mail that they did so. The LHDs are usually very responsive in terms of letting me know of any changes in their practices. The health directors did not receive the reminder because the survey was not sent to him/her. The LHD director received a notification letter (as will the program manager), but only the program manager and others involved in the implementation of the immunization program's activities received the survey link and the reminders. The reminder went to the program manager or immunization nurse manager.

provide pediatric immunization services[15] reduced the number of LHDs I connected with to 1,453. Three hundred ninety-one LHDs responded, resulting in a 26% response rate. The response rate for type of jurisdiction, based on NACCHO definitions, is outlined in Table 3.3. The breakdown of non-LHD respondents is shown in Table 3.4.

Table 3.3

Responding LHD Descriptive Data

Actual Respondents to date (9/14/10)				
Type of LHD	# sent	# responding	% of total	Response Rate
Small	809	178	45%	22%
Medium	554	144	37%	26%
Large	71	53	14%	75%
Mega	19	16	4%	84%
	1453	391	100%	27%

Data in this table are adapted from the National Association of County & City Health Officials Profile Survey, 2009.

[15] These LHDs reported that they provide adult immunization services, e.g., annual influenza and pneumococcal vaccinations to senior citizens, and episodic childhood vaccinations, e.g., back-to-school vaccination clinics and outbreak-specific vaccination clinics when schools or daycare centers are involved.

Table 3.4

Spectrum of non-LHD Respondents to Survey

Type of non-LHD	N	Percent of total respondents
Local Board of Health	11	3
Community Health Center	4	1
Visiting Nurses Association	3	<1
Federally Qualified Health Center	2	<1
Rural Health Center	1	<1

The non-LHD respondents were from smaller, rural jurisdictions. This is consistent with NACCHO data in that larger LHDs are funded at levels that allow them to provide comprehensive public health services and not have to partner with other community entities to deliver those services. These data are consistent with what NACCHO profile reports in terms of who delivers immunization services in the country's 3,000 local jurisdictions. The dominant entity that delivers these services when the LHD does not is the local board of health. This varies by state, e.g., in New England states it is mostly community health centers that step in to deliver these services in the absence of an LHD.

The survey was launched in August 2010 and was in the field for three weeks. Nonresponding LHDs were sent a reminder e-mail after seven days (the reminder e-mail went to the immunization program manager, the immunization nurse manager, or whoever else with

primary management responsibilities within the program), with a final request sent 72 hours before the survey link closed.

Modification of the Organization and Management Survey

I conducted a literature search for organizational culture measurement tools, particularly those used most frequently for health services research. The results of that search (using PubMed, Google Scholar, and Google Books online search engines) detailed whether they had been used in health care settings, the limitations of each instrument, and the advantages of each instrument in each setting it was used. Three articles provided comprehensive summaries of the spectrum of organizational culture tools (Delobbe, Haccoun, & Vandenberghe, 2006; Scott, Mannion, Davies, & Marshall, 2003; Taras, 2008). I reviewed those three articles for each type of instrument, identifying key elements that could apply to public health departments. I noted that Shortell's Organizational Management Survey was used frequently for health services research, and that helped narrow my focus to the particular health care settings it was used in. I needed to identify the setting that could be most parallel and comparable to an LHD immunization program.

Information about the Organizational Management Survey, why it was appropriate for this study, and the evidence to support its application to my research question were outlined in Chapter II. There are limited data on efforts to quantify organizational culture of health care agencies, and of those, many have used the Organizational Management Survey as the tool of measurement. Health care entities that have quantified organizational culture include hospitals, nursing homes, or nursing departments within academic centers (Helfrich, Li, Mohr, Meterko, &

Sales, 2007; Scott-Cawiezell, Jones, Moore, & Vojir, 2005; Wooten & Crane, 2003). There have been very few studies of efforts to characterize organizational cultures within public health departments (Griffith et al., 2007). As mentioned in Chapter I, my review of the literature did not uncover a study that quantifies and characterizes organizational culture across the local public health system to connect that overall culture to a particular outcome that continues to elude success—childhood immunization coverage rates.

The Organizational Management Survey was developed by Stephen Shortell, the chair of the department of health policy and management at the University of California, Berkeley, School of Public Health. Shortell asserts that once leadership embraces the role of advancing a quality culture through mission and vision, this can be disseminated through the multiple levels of the organization. The tool he developed to help characterize the culture of a health care organization, to identify the elements necessary for appropriate change to influence health outcomes, focuses on four levels of intervention to influence organizational culture: individual, team or micro-system, organization, and leadership.

The Organizational Management Survey highlights the relationship between organizational culture, staff performance, and health outcomes. It focuses on six key factors that inform the culture of a health care agency: leadership, staff cohesion, rewards, problem-solving, communication, and coordination (Ennis & Harrington, 1999). Organizational Management Survey is a theoretically grounded, comprehensive approach to understanding and improving organizational and managerial performance (Shortell et al., 1991). The Organizational Management Survey pays particular attention to the employee perspective, is consistent with a

commitment-based management philosophy, and emphasizes transcending apparent paradoxes to identify actionable solutions (J. Scott-Cawiezell, personal communication, December, 2009).

The Organizational Management Survey was initially developed for use in hospital intensive care units but has since expanded to be used in nursing homes and other long-term-care facilities. The Organizational Management Survey is simple, quick to complete—which is important if you want people to commit, given very busy agendas—has high face validity (Scott-Cawiezell et al., 2005), and has been used in multiple health care settings. It is a useful tool to assess the strengths and intersections and interactions of organizational culture, sub-cultures, and practices within organizations.

My decision to use the Organizational Management Survey as a template instead of the most commonly used instrument, CVF, was predicated on peer-review articles and multiple conversations with two researchers who had experience using both instruments. Personal communications from J. Scott-Cawiezell (December, 2009) indicated that CVF was not an appropriate tool for communicating results to staff members nor was it an easy survey to administer because of the need for staff to split and allocate 100 points amongst 5 responses. The Organizational Management Survey is easy to administer because it has a 5-point Likert-type response ranging from strongly disagree (1) to strongly agree (5) (Forbes-Thompson, Gajewski, Scott-Cawiezell, & Dunton, 2006). Personal communications with C. Helfrich (January, 2009; March, 2009) and results from his research regarding exploratory and confirmatory factor analyses of CVF's quadrants to a study conducted within the Veterans Administration (VA)

health system noted that it was not a good instrument for capturing the responses and perspectives of non-supervisors.

Scott-Cawiezell et al. (2005) used CVF to identify and understand critical organizational elements for the creation and sustainable improvement of nursing practices in nursing home settings. However, in personal communication to me, she noted that CVF did not translate well in terms of relaying specific actions that nursing home staff members could take to improve communications and leadership dynamics within their particular nursing home. It was this experience with CVF that led her to Shortell's Organizational Management Survey. A copy of her modification of Organizational Management Survey is included as Appendix F. I decided to borrow from and modify Scott-Cawiezell's nursing home survey because nursing homes 1) are regulated by LHDs, 2) provide services to a specific population, 3) collaborate closely with LHDs to deliver immunization services regularly (providing influenza and pneumococcal immunizations during each influenza season), and 4) depend on governmental programs (e.g., Medicaid and Medicare) for funding and fiscal operational support.

I acquired permission from Scott-Cawiezell to use her survey as a template to develop my survey to quantify LHD immunization program organizational culture. The e-mail exchange between me and the author is included as Appendix G. The survey instrument was modified to let respondents add their own comments for collection of qualitative data related to their LHD's organizational culture, their reactions to that culture, and information on strategies they have used to work effectively within that culture. The Organizational Management Survey applied as a means of measuring organizational culture within health departments focuses on the structural

capacity by characterizing how the people within the agencies interact within the agency as well as with external partners and stakeholders. The survey instrument is included as Appendix H. I modified the scale to an expanded 7 points, ranging from "1=strongly disagree" to "7=strongly agree." This type of 7-point response scale has been used in previous health service research projects and the developed scales have documented acceptable levels of reliability and validity (Cameron & Quinn, 1999; Quinn & Spreitzer, 1991). I used a 7-point scale to increase potential variability, and in essence provide exclamation points for the respondents to show the urgency of their situations and indications that action to place quickly.

The survey questions were piloted by four LHD immunization managers, who represented the types of LHD staff expected to receive and complete the survey for this study. The four LHDs reviewed the instrument to determine if it was understandable, if the scales are measuring what they are intended to measure, and to assess average completion time. To assure that my modifications to the Organizational Management Survey instrument did not change the subscale, I used SPSS to conduct principle component analysis (PCA) to see if the factors or subscales that emerged with this data set were the same as those identified and validated by the Organizational Management Survey (Snook & Gorsuch, 1989; Tabachnick & Fidell, 2000). I used PCA to allow for extraction of as many significantly separate factors as possible from the data set generated by the survey respondents. The number of factors with eigenvalues greater than 1.0 were identified for factor retention. Items with factors loadings of more than 0.35 and those that did not load on more than one factor, i.e., that did not cross-load, were retained for analysis. PCA with varimax rotation was used to determine the maximum number and nature of

the factors comprising that the modified Organizational Management Survey items defined. Reliability of the final scale was assessed using Cronbach's alpha and the mean inter-item correlation, an indicator of item homogeneity in a scale. Additional information on the data analyses and results are discussed in Chapter IV.

Survey Platform, Development, and Dissemination

The study survey instrument was developed and disseminated via Zoomerang, an online survey-development, dissemination, and data collection tool. Zoomerang was an appropriate method for 1) disseminating the survey instrument to thousands of recipients and 2) reliable and convenient data collection (Evans & Mathur, 2005). Data collected via Zoomerang were downloaded to Excel, and then loaded into SPSS for analysis. The data collected in the survey augmented existing data from the 2008 Profile of Local Health Departments[16] (NACCHO, 2009). The Profile data give ecological and descriptive census data on LHDs that serve as important background.[17]

Data Sources

The study used one database source for LHD immunization program managers, one database for LHD demographic and descriptive data, and two external data sources—NIS and kindergarten retrospective survey (KRS) immunization coverage rate data—to include in its analysis. The independent variables identified in this research came about through an iterative

[16] The Profile is the report of NACCHO's triennial census of all local health departments in the U.S. The final report is available online at:

[17] All LHD demographic and descriptive data are available at: http://www.naccho.org/topics/infrastructure/profile/resources/2008report/upload/NACCHO_2008_ProfileReport_post-to-website-2.pdf.

process. They were cobbled together from review of literature on ISD, my individual work experiences within and on behalf of public health immunization programs, and the key informant interviews conducted in May, 2008. This process for identifying variables is common in the literature (Baron, Loeffler, McMakin, & Aref, 2003; Crowe, 2006; Ivester, 2006; Luman, 2004; Madamala, 2004; Todd, 2007).

1. The database of LHDs and its key staff contacts is maintained by NACCHO via their tri-annual Profile Survey of the nation's 2880 local health jurisdictions.
2. NACCHO's 2008 Profile data were used to construct demographic descriptive profiles of LHDs—disaggregate the LHDs into small, medium, large; urban, rural, and suburban jurisdictions—to include in the regression analyses models.
3. The NIS local data from 2008 were used as supplementary data because it gathers current childhood immunization coverage rates in the 15 local jurisdictions included in the annual survey.
4. The KRS[18] data were used as the primary source of information that details childhood immunization coverage rates in local health jurisdictions in the U.S. that are not a part of the NIS.

[18] The KRS is a 2-stage simple random sample design for each county or city LHD within a state to assess the immunization rate amongst its kindergarteners. For each school with a kindergarten (public and private), a random sample of students is selected and immunization records are reviewed and 4:3:1:3:3 rates are recorded to get coverage rate data as to whether those inoculations were received before the 3rd birthdate.

Processes for Data Analyses

Several key steps were necessary for data analyses and identification of patterns in the data. There were five phases or steps to follow to analyze data for this study. The following provides an overview of the phases in this process. This study focused on a limited number of variables—one outcome variable and 5 independent variables to help explain the variations in the outcome of interest.

1. Data Cleaning and Data Bridging. Once the data collection was completed, I closed the survey link so that no additional responses were added. I downloaded the dataset to Excel to conduct some preliminary analysis. I counted the total number of responses. Partially completed surveys were excluded from analysis. Because I have the ID number for each LHD, I linked the survey data with the Profile data so that a complete profile of the LHD was included in the final data set—data that include community demographic profiles—whether the jurisdiction was suburban, urban, or rural, and the population size of the communities served by the LHD. LHDs that serve communities with less than 50,000 people are considered small; LHDs that serve communities with populations between 50,000 and 250,000 persons are considered medium; LHDs that serve communities with populations between 250,000 and 750,000 persons are considered large; and LHDs that serve populations with more than 750,000 persons are considered mega.
2. Outliers. After the initial data cleaning and bridging, I calculated descriptive statistics for the mean score and standard deviation of all the variables. I ran bivariate correlations for all of the items to assure that the items were appropriate for PCA. Each item had to

have a correlation of at least .30 with at least one other item to make sure it fit in a PCA with the other items.

3. Review of Respondent Comments on the Survey. As part of the survey, and for each section of questions, respondents were asked if they had additional comments on their LHD's work environment, organizational leadership, and organizational culture. These comments provided some additional insight into the ideas and experiences that may have shaped their responses to the survey questions.

4. PCA of the Organizational Management Survey Results

There are six dimensions of the Organizational Management Survey: leadership (manager's style), communication, problem-solving, rewards, team cohesiveness, and coordination. I used PCA instead of exploratory factor analysis because my goal was to reduce the variables into a linear combination of variables in factors that represent structurally separate or uncorrelated factors (Fabrigar, Wegener, MacCallum, & Strahan, 1999). I conducted PCA to confirm that the LHDs' responses were consistent with the factors that are defined by the Organizational Management Survey. PCA allowed me to determine the goodness of fit of the data. This step was important because: 1) although the Organizational Management Survey has been used for a long time and frequently to measure organizational culture in health care settings, it has only been evaluated once in a health care setting to validate its subscales (Helfrich et al., 2007); 2) I have significantly modified the original Organizational Management Survey instrument as well as the Organizational Management Survey-based nursing home instrument developed by Scott-

Cawiezell et al. (2005), including changing from a 5-point to 7-point response format; and 3) I used this type of instrument in a very different public sector, service-providing population—local immunization program managers instead of nursing home directors, hospital administrators, or hospital-based departmental leaders and managers.

5. Hierarchical Regression Analysis (HRA). A multiple regression model was used to explore the predictive nature of specific factors. This study examines one key outcome variable (childhood immunization rates) and the impact that multiple independent variables have (or do not have) on it. The dependent and independent variables are described in greater detail in the Variables section of this chapter. HRA is a common method in health services research and is an appropriate technique for use in this type of exploratory study (Cohen & Cohen,1975; Slade et al., 1996; Williams, 2008). There is a dearth of information on the role that agency culture, program, and practices have on specific health outcomes.

Variables

The primary independent variable of interest was organizational culture. The independent (control) variables (type of LHD, type of jurisdiction, and participation in an immunization coalition) were included in the model because of their documented influence on the dependent variable, childhood immunization coverage rates. Based on the literature research outlined in Chapter I, I used those data as a guide for the order of entering the variables into the HRA. I entered the LHD characteristics in the first block of variables to serve as controls. I then entered the two independent variables of interest—the two factors that emerged from the PCA—in the second block of

explanatory variables. The outcomes of the PCA showed that the respondents' answers could be grouped into 2 "factors"—(1) ways they experience their LHD's organizational culture and (2) opinions on the LHD's leadership. I used the stepwise enter method in SPSS to enter the data within blocks. The descriptive agency characteristic variables are independent variables and they were put in the first block of variables entered into the regression analysis. The factor scores were the variables of interest and they were put in the second block of variables entered into the regression analysis. The local immunization rates were the dependent variables.

Additional discussion of these methods is included in Chapter IV, where results of the study are written about in detail.

Ethical Considerations

Surveys seeking to gauge input on an organization's culture and leadership are sensitive. Respondents were assured that statements, comments, and answers provided to the survey have been kept confidential, that data will be reported in aggregate, and specific comments will not be attributed to any one jurisdiction, individual, or LHD. Given that the focus of this study is on immunization programs, even in the largest LHD, there are a limited number of individuals who work within such a program, thus making it possible to identify individuals who responded to the survey and made specific comments.

The LHD leadership (i.e., the health official) were informed of the project via e-mail as a courtesy, because LHDs are frequently surveyed by multiple entities, including their state health departments. The e-mail letter explained the nature of the survey, its aims and objectives, that

there was no obligation to participate, and there would be no negative consequences of participating or declining to participate.

The e-mails and the survey introductory statement emphasized that survey results will have utility to the LHD in terms of betterment of the organization and its performance in regard to ISD, and will not be an evaluation of the LHD leadership or a specific individual's performance.

Institutional Research Board (IRB)

The study was submitted to the Institutional Review Board (IRB) at Antioch University. The study involved collection of data from governmental employees performing their standard duties and activities, with the cooperation from their leadership. NACCHO entered into an agreement with the researcher to share data with this study. The data-sharing arrangement was submitted to IRB at Antioch University.

Chapter IV: Results

Overview

This chapter will review: The total number of participants who either fully or partially completed the survey; breakdown by the demographic groupings; descriptive statistics including mean score, standard deviation, skewness, and kurtosis of all the items (see Appendix J); new variables created from the factor analysis; data reduction results; reliability coefficient values; multiple correlation coefficients; multiple regression analysis results; and how the qualitative ILA helped me analyze and make meaning of the quantitative data.

As stated in Chapter III, the total sample size was 1,453 LHD immunization programs, with 391 LHDs responding to the link. The survey data were exported from Zoomerang to MS-Excel to better facilitate reformatting the data set before it was imported into SPSS v17.0. Once the data were in SPSS, I named the variables, assigned labels, and set all of the column headings for my data type. Next, I conducted an initial screening of the data to remove responses that were not fully completed. This resulted in 40 respondents being removed due to incomplete data. This resulted in 351 usable responses. I decided to drop the partial respondents, instead of "averaging" the responses, because they failed to respond to entire sections of the survey. I thought that would skew the results of subsequent analyses because I grafted answers about coordination and applied them to rewards or leadership.

Descriptive Statistics

Descriptive statistics were run on all the items. Percentage distributions were used to describe the LHD characteristics. Means, standard deviations, and measures of skewness and kurtosis were used to describe the Organizational Management Survey items. The item with the largest mean was "I take pride in being a part of the team," with a 5.91 mean. Appendix J contains the SPSS descriptive statistics for all of the variables.

A kurtosis or skewness value between +/- 1 is appropriate for Likert-scale measures such as the instrument I used. However a value of +/- 2.0 is also acceptable in many cases (George & Mallery, 2002) and (Blaikie, 2003) suggests that +/-3,0 is also acceptable, particularly for measures of kurtosis. I used the more liberal criterion of +/- 2.0 for skewness and 3.0 for kurtosis. Five of the Organizational Management Survey items had kurtosis >3.0 and were excluded from subsequent analyses. These items are highlighted in Table 4.1. None of the variables had skewness >2, so none were excluded due to extreme measures of skewness.

Table 4.1

Results of Running Descriptive Statistics for the LHD Database

Item	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Getting the job done	-1.199	.130	3.278	.260
Is focused on productivity, achieving goals, and getting the job done	-1.104	.131	3.984	.261
I take pride in being a part of the team	-1.225	.132	3.733	.263
I identify with the goals of the division	-1.088	.132	3.689	.263
I feel that I am a significant part of the team	-1.365	.132	4.616	.263

Note. None of the items had skewness >2. Five items had kurtosis >3.

Correlations

After completing the descriptive statistics, and removing the five items with high kurtosis levels, I ran the bivariate correlations on the remaining items, and I had only one rule to apply: Any item not correlating with at least 1 other variable at >.3 would be excluded. After running the analyses, only one item did not correlate with at least 1 other item at 0.3—formal and structured with lots of rules and policies. That variable was one of the Organizational Management Survey original organizational culture items.

The items listed in Table 4.2 had the strongest correlations (>.6). The Organizational Management Survey subscale of each item is included in parentheses.

Table 4.2

Strongest Correlations of all the Survey Variables

Items 1	Items 2	Correlation Value
Highly productive (Culture)	Relaxed and friendly (Culture)	.648
Teamwork and group decision making (Staff cohesion)	Being creative (Culture)	.658
Teamwork and group decision making (Staff cohesion)	Is focused on teamwork and concern for colleagues (Culture)	.693
Promotes competition, achievement of target goals, and objectives (staff cohesion)	Competition with other community stakeholders to improve immunization coverage rates (Leadership)	.633

It makes sense that staff cohesion would be an aspect of how LHD immunization program staff experience their organization's culture—as either a connected or disconnected group of colleagues.

Principle Component Analysis (PCA) Results

To determine the interrelatedness of the scale items, I performed a PCA that included all responses from LHDs and organizations that deliver immunization services on behalf of LHDs. I used SPSS-17 to exclude respondents with missing values.

To conduct PCA, I followed a multi-stage process. Using the descriptive statistics described above, I applied decision rules for retention of the items to ensure that the variables included in the analysis were approximately normally distributed and at least moderately correlated with each other. The decision rules were as follows:

1. Items with Kurtosis >3 were eliminated
2. Items with Skewness >2 were eliminated

3. Any item that did not correlate with at least one other item at >.3 was excluded from analysis

Preparing the Database for PCA

After completing the descriptive statistics review and removing the 6 Organizational Management Survey items that did not meet the criteria under the three rules, I loaded the MS-Excel database into SPSS. I then ran the remaining items through PCA. As with the descriptive statistics, I applied certain standard rules within SPSS to the PCA (Kim & Mueller, 1978).

First iteration of PCA. I used the above-mentioned rules within SPSS to run the first PCA. This run resulted in the items sorting across the six Organizational Management Survey dimensions. Multiple items cross-loaded on more than one factor. Those items were removed before the second iteration. The results of the first iteration explained 73% of variance in all of the items entered into PCA. The cross-loading items that were deleted before the second iteration are listed below:

1. Is risk taking
2. Is organized and efficient
3. Is productive
4. Being creative
5. Job security and predictable processes
6. Is focused on adhering to specific rules and policies
7. Emphasizes trying innovative strategies to solve problems
8. Is focused on developing leadership skills in staff members

9. There is good communication between staff and management

Subsequent iterations of PCA. I removed the nine cross-loading items from the first iteration and ran PCA for a second time. The remaining items then sorted into four sub-scales related to culture, leadership, staff cohesion, and coordination. The four factors explained 67% of the variance. Three items related to culture and staff cohesion cross loaded and were excluded from the third iteration. The third iteration reduced the number of factors the items loaded on to just three—related to culture, leadership, and coordination. This iteration explained 69% of the variance, and two items related to culture cross loaded on the factors. The fourth iteration (Table 4.3) was the final iteration, as the items loaded on to just two factors—related to culture and leadership sub-scales. This two-factor model explained 68% of the variance.

Table 4.3

Items Loading on Two Factors

Factor 1 (Leadership)	Factor 2 (Culture)
Is like a coach or mentor	Promotes competition, achievement of target goals & objectives
Provides strong guidance to staff	Is focused on achieving better childhood immunization coverage rates compared to neighboring jurisdictions
Is sensitive to staff needs/concerns	Emphasizes loyalty, trust, and commitment
Encourages staff to take the initiative	Is focused on exceptional service delivery
Asks what staff members think about work-related issues	Promotes a sense of trust, openness, and staff development
Is in touch with staff views and concerns	Is focused on team work and concern for colleagues
Gives staff opportunities to grow and improve skills	It is easy for me to talk openly about work-related issues with my colleagues
Is one who has a high opinion of his/her staff	

After the final PCA run two components, or factors remained. The items and the component loadings are shown in Table 4.4.

Table 4.4

Results of the Final PCA Run

Rotated Component Matrix[a]

Item	Component	
	1	2
Is like a coach/mentor	.849	
Provides strong guidance to staff	.861	
Is sensitive to staff needs/concerns	.878	
Encourages staff to take the initiative	.793	
Asks what staff members think about work-related issues	.857	
Is in touch with staff views and concerns	.888	
Gives staff opportunities to grow and improve skills	.840	
Is one who has a high opinion of his/her staff	.686	
Emphasizes loyalty, trust, and commitment		.824
Is focused on exceptional service delivery		.828
Promotes a sense of trust, openness, and staff development		.834
Is focused on team work and concern for colleagues		.832
It is easy for me to talk openly about work-related issues with my colleagues		.734
Promotes competition, achievement of target goals & objectives		.567
Is focused on achieving better childhood immunization coverage rates compared to neighboring jurisdictions		.545

Factor 1 items focused on aspects of agency leadership; Factor 2 items concerned how respondents experienced their agency's culture. Reviewing the focus of items within each factor, I assigned a new sub-scale label. I labeled Factor 2 items as "Organizational Culture," because

it reflected the ways that respondents experience organizational culture within their LHDs. I labeled Factor 1 items as "Organizational Leadership," because they reflected the views and opinions of respondents on their agency's leadership. For the purposes of this study, the concept of who the respondents viewed as their leader was not defined. Because of the variegated nature of LHDs, and LHD immunization programs in particular, the "leader" could be the division director, the health director, or the community health center director.

The eigenvalue of Factor 2 (7.887) was almost four times larger than that for Factor 1 (2.37). Additionally, the Organizational Culture factor accounted for 53% of the variance and the Organizational Leadership factor accounted for 15% of the variance.

Internal Consistency of Factors—Reliability

To determine how well the scale items reliably measured organizational culture and Organization Leadership, I ran a reliability test to get a value for Chronbach alpha coefficient of each scale. The higher the score, the more reliable the generated scale is. Nunnaly (1978) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature. The actual Chronbach alpha values for this study are much higher (.879 and .952) and are listed in Table 4.5. This indicates that each item is measuring the same construct as the rest of the items in the scale.

Table 4.5
Summation of Reliability Test Results

Component	Cronbach's alpha	Number of Items
Factor 1	.879	7
Factor 2	.952	8

I calculated the inter-correlations of all the items that make up the factors. *Table 4.6* reflects the inter-relatedness of the items and shows the scale reliability if any of the items are deleted. This process helped identify items that, if deleted, would increase the reliability of the scale.

Table 4.6

Item-Total Statistics

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Promotes competition, achievement of target goals & objectives	33.20	26.883	.496	.883
Is focused on achieving better childhood immunization coverage rates compared to neighboring jurisdictions	32.62	26.523	.462	.891
Emphasizes loyalty, trust, and commitment	32.34	25.114	.777	.848
Is focused on exceptional service delivery	32.09	25.184	.743	.852
Promotes a sense of trust, openness, and staff development	32.34	24.448	.798	.844
Is focused on team work and concern for colleagues	32.34	24.559	.772	.847
It is easy for me to talk openly about work-related issues with my colleagues	32.09	26.218	.667	.861

For this study, the tabulated data show that if any of the items were deleted, there would be no appreciable increase in the alpha value. This indicates that each item is measuring the same construct as the rest of the items in the scale. What this means is that removal of any of the items

would not make the scale a more reliable measure or more reliable as a predictor. The high Chronbach alpha values show that the PCA results are reliable measures of the organizational culture and leadership constructs. With 53% of the variance explained by the Organizational Culture and 15% explained by the Organizational Leadership factors.

Regression Analysis

The final step of the analysis was to run regression analyses to determine the predictive ability of the independent variables in determining the effect of LHD organizational factors on childhood immunization coverage rates. The basic steps of multiple regression analysis were followed: Entering the data for the variables into the regression model in blocks and then analyzing the results. The dependent variable was the immunization coverage rate provided through the NIS or KRS data. The independent variables were the two resulting factors from the PCA and four additional descriptors about the LHD immunization programs—LHD Type, Agency size, Jurisdiction Type, and Immunization Coalition participation. The four agency characteristic variables were converted into dummy variables with codes as shown in Table 4.7.

Table 4.7

Dummy Variable Coding

Variable	**Names**	**Dummy Variable**
LHD Type	LHD Non-LHD	0=LHD 1=non-LHD
Agency size	Small Medium Large Mega	0=Small/Medium 1=Large/Mega
Jurisdiction type	Rural Urban Suburban	0=Rural 1=Not rural
Immunization Coalition	Participation (Y/N)	1=Yes 0=No

The four demographic variables used for the HRA. For this part of the analysis, I used: 1) Type of LHD—coded for LHD (meaning that the LHD could be a city, county, city-county hybrid, an agency of the state HD, or district or regional LHD); non-LHDs were those entities (e.g., visiting nurses associations, local boards of health, community health centers, rural health centers, university student health centers) that deliver LHD services (immunizations, inspections, enforcement of regulations) within a community; 2) Type of Jurisdiction (rural and not rural); 3) Type of Agency (small or not small); and 4) Immunization Coalition participation status. These were the variables that I coded as dummy variables. Recoding as dummy variables was an important step in the process because HRA requires scale-type data for analysis. Because each variable has multiple characteristics, recoding them as dummy variables made them appropriate for the analysis process. I recoded LHD Type as LHD or non-LHD because most community agencies that deliver immunization services are LHDs. A minority of these entities

are community health centers, visiting nurses associations, rural health centers, or federally qualified health centers. I recoded Agency size as small or non-small because most LHDs in the country, 63% of them, serve jurisdictions that are small (<50,000 people in the catchment area [NACCHO, 2008]) and because most respondents to the survey represented small LHDs or other agencies. I recoded Jurisdiction Type as rural and not rural for the opposite reason. Most of the country's population is urbanized, so it was logical to split the coding along those lines. Many suburban LHDs serve urban or peri-urban populations.

As noted in Chapter I, my research question asked whether organizational culture influenced the variations noted in childhood immunization coverage rates. Because I wanted to control for the LHD characteristics before accounting for the effect of Organizational Culture and Organizational Leadership, I used the block by block and stepwise method of entering the predictor variables into the regression model.

Bivariate analysis of predictor variables. I conducted a bivariate analysis of the independent variables to look at the pattern of the relationships amongst them. The output is shown in Table 4.8. The results from the correlation analysis provide some support for the findings of the qualitative study: community engagement (IZ Coalition) and Type of LHD have a low (.225), but statistically significant correlation, implying that non-LHD agencies tended to be more likely to be involved with immunization coalitions. As could be expected Type of Jurisdiction and Agency Size have a high negative correlation (-.840), which is a manifestation of small LHDs' demographic profile. Only 18% of small LHDs serve rural populations (NACCHO, 2008, p. 24). Most small LHDs serve urban, peri-urban, or suburban populations.

The larger (mega populations) jurisdictions in the U.S. provide immunization services to half of the country's population—five percent of all LHDs deliver public health services to 50% of the population (NACCHO, 2008). These LHDs that serve very large and mega-sized populations are much more likely to have self-contained and wrap-around services that they deliver to the communities they serve. Unlike the smaller jurisdictions, larger-sized LHDs have direct connections to communities through the programs and services that are available at the health department itself. Smaller LHDs do not have such capacities and must depend on stronger engagements with community providers, community health centers, and other service providers in their jurisdictions. These descriptions do not mean that larger LHDS do not have similar community linkages, but point to the reality that these linkages help in a very different way in that they help more with community outreach, education, and credibility and less so with the practical aspects of service delivery.

Table 4.8

Bivariate Results for Independent Variables

Variables		Type of LHD	Type of Jurisdiction	Agency Size	IZ coalition	Org Leadership	Org Culture
Type of LHD	Pearson Correlation	1	.045	-.095	.225**	.135*	.010
	Sig. (2-tailed)		.430	.090	.000	.016	.857
	N	316	316	316	316	316	316
Type of Jurisdiction	Pearson Correlation	.045	1	-.840**	-.008	.134*	.091
	Sig. (2-tailed)	.430		.000	.890	.017	.106
	N	316	316	316	316	316	316
Agency Size	Pearson Correlation	-.095	-.840**	1	-.034	-.098	-.046
	Sig. (2-tailed)	.090	.000		.544	.083	.418
	N	316	316	316	316	316	316
IZ coalition	Pearson Correlation	.225**	-.008	-.034	1	.173**	.084
	Sig. (2-tailed)	.000	.890	.544		.002	.136
	N	316	316	316	316	316	316
Org Leadership	Pearson Correlation	.135*	.134*	-.098	.173**	1	.546**
	Sig. (2-tailed)	.016	.017	.083	.002		.000
	N	316	316	316	316	316	316
Org Culture	Pearson Correlation	.010	.091	-.046	.084	.546**	1
	Sig. (2-tailed)	.857	.106	.418	.136	.000	
	N	316	316	316	316	316	316

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Organizational Culture was not significantly correlated with any of the other variables. I think this was due to the way that immunization staff experience their agency's culture is not unique to any particular type of LHD, agency, or jurisdiction. Whether the immunization staff are strongly connected, communicate well, focus on excellent service delivery, or focus on reaching their immunization service delivery goals and targets are associated with the outcome variable but not the other predictor variables.

The HRA results. For the output, I was interested in three key statistics: The change in the F-statistic, the significance of that change, and the adjusted R^2 value. From the table, the F-statistic for Organizational Culture factor was 13.529 and it was a significant predictor of the variations in childhood immunization coverage rates. Type of LHD added another 4.579 to the F statistic and was also a significant predictor of the coverage rates. The other variables fell out of the model (see Table 4.9).

Table 4.9

Model Summary

Model Summary[c]

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	.208[a]	.043	.040	12.401	.043	13.529	1	299	.000	
2	.240[b]	.058	.051	12.328	.014	4.576	1	298	.033	1.329

a. Predictors: (Constant), OrgCult

b. Predictors: (Constant), OrgCult, Type of LHD

c. Dependent Variable: CICRs

The amount of variability in the dependent variable accounted for by the predictor variables together was relatively small. R^2 for the Organizational Culture factor was .043 and when Type of LHD was added R^2 increases to .058. The amount of variance explained by the two variables, appears small, but for this particular context 5.8% was both statistically and practically significant. Many competing variables impact immunization coverage rates, as outlined in Chapter I and Chapter II. Within public health, even small effect sizes can have clinical significance. Within the immunization field in particular, if we understand that a particular set of variables has an almost 6% impact on variations in immunization coverage rates and take appropriate steps, we may see a subsequent increase in coverage rates and thus a decrease in morbidity and mortality due to particular vaccine-preventable diseases.

Open-Ended Responses from the Survey

For each section of the survey, I allowed for open-ended responses from the participants. This was so that they could express what they thought about each topic within their agency (e.g., communications, staff cohesion) in their own words versus the stricture of the choices within the survey. The plan was to separate them from the survey results, read through them for emergent themes, categorize them, examine whether there were similarities and/or differences across jurisdictions and types of agencies/LHDS and then assign each response to a category.

I read over the responses, and there were no emergent themes. Most of the responses reiterated what had been asked in the questions (e.g., “we are a very cohesive team and support each other”). Some of the responses were more detailed and have been included in Chapter V to give voice to the findings and results from the analyses.

Summary

Two scales emerged from the PCA – Organization Culture and Organization Leadership. When those results were included in a regression analysis, Organizational Culture and Type of LHD were significant predictors of childhood immunization coverage rates. Analysis of the open-ended portion of the survey did not reveal any additional insight into responses by the participants. The data analyses support the central research question of this study—that agency factors, particularly Organizational Culture, have a significant impact on community childhood immunization coverage rates.

Chapter V: Discussion

This chapter discusses the results and findings of the study and their practical implications for public health agencies and other community partners who deliver immunization services.

Interpretation and Discussion of Findings

Public health practice was pushed into a "new normal" with the occurrence of multiple public health emergencies early in the 21st century, as outlined in Chapter I. In the age of SARS, bioterrorism, and other health emergencies presented in Chapter I, public health has had to learn that this is an era where organizations must exploit the time and talent of their staff members due to the added pressures of the rapidly changing practice landscape. I selected local immunization programs as a point of study because of the rapidly changing dynamic of governmental public health, health care law, and vaccination recommendations.

The research question was: Does local health department organizational culture help explain and contribute to the wide variations in U.S. childhood immunization coverage rates? The data show that it is the organizational culture—in this case, the staff members, how cohesive they are, how they communicate with one another, and how they work that impact how they deliver public health services, particularly immunization services. Nordstrom and Ridderstrale (1999, p. 118) wrote that it is organizational talent, more than anything else, that allows organizations to be unique, to escape business as usual. The qualitative study results showed that it was those immunization staff who felt empowered and who felt a sense of ownership who

figured out ways to overcome any obstacles (financial, material, political) and deliver the services they were mandated to deliver to the community.

Immunization managers who were interviewed in the preliminary Case Studies who perceived their agency leadership to be participatory, risk-takers, and coaches were characteristic of higher performing LHDs in terms of vaccine coverage rates. The data in Table 4.7 in Chapter IV show that Organizational Leadership has a somewhat strong correlation to Organizational Culture (.546). This correlation is consistent with the notion that leadership is an important factor in an agency's culture. This bivariate analysis corroborated what the case study participants told us in the ILA study. Leaders who emphasized empathy toward staff needs, opinions, and provided opportunities to improve skills were also associated with those agencies with higher immunization coverage rates. These types of leaders may be more skilled at supporting their staff as budgets decrease, work demands increase, and LHDs have to provide more oversight to community providers. As noted in Table 4.7 in Chapter IV, Organizational Leadership has low correlations with Type of LHD (.135), Type of Jurisdiction (.134), and participation in an immunization coalition (.173). This is not particularly surprising because most of the survey respondents were from small jurisdictions. Smaller jurisdictions tend to farm out their immunization services or work in closer collaboration with community partners. This level of engagement would manifest in more rural than in more metropolitan districts where funding for immunization services is greater due to the case load of pediatric patients (a simple issue of population dynamics).

Furthermore, the qualitative study showed that those LHDs that emphasized loyalty and commitment and focused on exceptional service delivery and achievement through measurable goals and objectives were all significantly correlated with higher coverage rates. These characteristics may be indicative of programs that are well positioned to adapt to a changing public health practice environment while also focusing on the needs of the community. Similarly, immunization programs that distribute rewards equally, based on teamwork and concern for colleagues, were also associated with higher rates. Surprisingly, participation in community immunization coalitions was not a significant predictor of immunization coverage rate variations. However, the qualitative data showed that community engagement and the role that plays in making the LHD more credible was very much a factor in higher coverage rates.

This study found that organizational culture items related to staff cohesion, communication, trust, and competition to achieve better results were influencers of variations in childhood immunization coverage rates. LHDs that experienced their agency's culture as supporting a dynamic, competitive, and communicative environment with a commitment to trust, openness, and teamwork were associated with higher coverage rates. The HRA results bore out this conclusion. The LHDs with staff members who saw themselves as champions and who collaborated effectively were more likely to have higher coverage rates. As noted in Table 4.1 in Chapter IV, the work culture and staff cohesion subscales had the strongest correlation, which I interpreted to mean that these items in the scales had a strong relationship to each other, and could represent the same underlying variable of interest—LHD organizational culture (Rietveld & Van Hout, 1993). The qualitative results showed similar results, as noted in Chapter III.

Conclusions

Although preliminary, the study's findings suggest that aspects of organizational culture, including staff agency and leadership play a significant role in community health outcomes. In every organization—public or private sector—there is the formal organization that is manifested through structure, systems, and strategies and then there is the "informal" one. This study presents a small step toward understanding how the vital mix of human psychology, organizational culture, social networking, and communities of practice that make the organization work (Garmestani, Allen, & Gunderson, 2009; Harrison & Carroll, 2006) converge within LHD immunization programs to play a role in community childhood immunization coverage rates. The LHDs that functioned as case studies in the ILA did not make decisions in a vacuum, and each recognized that they were not surprised when their ability or inability to execute and deliver ISD was successful or fell short of goals and expectations. Those LHDs with persistently low coverage rates indicated that the goals articulated by ACIP and Healthy People 2010 are not grounded in reality—the realities of local capacity, knowledge of community and partner needs, or based on their real resources, realistic time frames, or careful management of resources. Those LHD immunization programs with better coverage rates saw those goals as motivators—a target to aim for and work toward—instead of unattainable barriers due to lack of resources. Again, a key factor here was an organizational culture that allowed staff to act as champions and exercise leadership to improve practice.

> I do feel like I am a champion. People bring up obstacles and all sorts of things. And, "Don't do this," and, "Be careful of this," and that kind of [thing]. But then I sat there and thought, Wow, they're giving this stuff away. Isn't there anything that we can do with it? **(**Immunization Nurse, mid-Atlantic suburban LHD)

Understanding how organizational culture within LHD immunization programs can be shaped and modified will be a critical aspect of determining how and where to intervene to affect the most change to improve practice, and ultimately, childhood immunization coverage rates. Conversely, examining the role of agency in community health outcomes, in their roles as gatekeepers to resources, services, and opportunities of access as well as their role in perpetuating or dismantling power structures, is critical to understanding how agency as an aspect of organizational culture impacts health, well-being, and health outcomes.

An understanding of how various aspects of health department organizational factors impact community health outcomes is an important aspect of transforming public health practice and thus the public health system's infrastructure (Rowitz, 2003). Knowledge derived from this study can fill gaps in understanding the ways that an LHD's culture contributes to the quality of ISD in a health jurisdiction. This study will help begin the establishment of an empirical basis for evaluating "how" LHD organizational factors operate in LHDs that can inform internal planning and improvements in a specific health outcome.

The 6% explanation of variations in childhood immunization coverage rates can help LHDs better understand how they can double-down on their commitment to equal access to public health services. The concrete dimensions of the survey tell them their organization's strengths and weaknesses in practical terms (e.g., whether they have staff cohesion,

communications, or leadership challenges) and can help them have discussions around practical solutions to help facilitate work culture changes. Even small inputs like these discussions and lessons from other LHDs can help lead to longer-term improvements in immunization service delivery and coverage rates.

The findings of the study suggest that, policy development in relation to of immunization coverage improvement should shift some of its focus to improvements in LHDs' organizational culture and how its employees experience that culture.

Implications for Practice

Over the past 20 years the U.S. has had several multi-state outbreaks of vaccine-preventable diseases that have caused several pediatric deaths. At the same time, families and providers have begun to stop or alter vaccinations for their children, leaving them vulnerable, while the country risks additional outbreaks. The current study does not solve this problem, but, hopefully urges for more study, research, money, training, and resources to support cultural change in health organizations.

In reading, reviewing, and reflecting on this research and the findings of this study, coupled with my experience in immunization service delivery and public health practice, multiple ideas resulted in some conclusions that impact this topic and the literature. LHD immunization staff must understand the necessity of these findings and be able to appropriately demonstrate in practice what the organizational policies and procedures dictate and how they interpret and apply them. Unfortunately, based on the survey responses, many professionals working on a daily basis may feel unprepared and powerless to address their agency's problems

and challenges, including the perspectives and practice behaviors that contribute to poor outcomes. Because the data showed that agency culture and the type of LHD are critical components of predicting coverage rates, it seems apparent that developing and maintaining a culture of practice that improves communication between staff, staff cohesion, and staff that feel valued and empowered to act are of paramount importance to the overall success of the LHD to improve its coverage rates.

An important key planning detail to remember is that these LHDs have developed their cultures over many years, and interventions to support change will be a long-term challenge, even with improved leadership, resources, and political relationships within their communities. Ongoing clarification of their duties, support, and supervision with effective feedback, training, and evaluation of their performance in following through are critical pieces of the process.

As public health departments become more involved in service delivery and assurance, the characteristics of organizational culture such as teamwork, trust, loyalty, and commitment to excellent service delivery will become more crucial for helping the nation achieve its Healthy People 2020 goal of assuring that at least 90% of children should be up to date with their vaccinations before they are three years old. The ongoing measles outbreaks and pertussis outbreaks (Omer, Salmon, & Orenstein, 2009) offer lessons that organizational culture has a tremendous role to play in how effectively an agency engages its community to assure that vaccination rates remain high.

The results from the qualitative study combined with documented immunization coverage rates showed that many jurisdictions with high uninsured populations, poverty, and other

socioeconomic challenges continue to beat the odds and vaccinate >80% of their community's children. That is because the agency's culture promotes a sense of trust, openness, and staff development and is focused on team work to overcome community challenges.

Second, the results show that there is no magic formula to improving coverage rates. The agencies with higher rates did not invest in advanced technology or management tricks. They focused on basic aspects of defining goals and targets and working toward achieving them, they communicated across practice silos, and they expressed a deep concern for their colleagues and their communities—the qualitative and quantitative components pointed to this conclusion. Thus, this study showed that it is straightforward behavioral actions that improve agency culture and thus affect the outcome of interest. These behavioral actions include the items outlined in the Organizational Culture scale of the Organizational Management Survey.

Immunization staff that communicated well with each other was a more cohesive staff that did not have problems asking for help and looked forward to working with their colleagues. People with this mindset may impact outcomes through their more collaborative behaviors. LHDs where immunization staff felt like champions and where staff felt that their leaders understood them and encouraged them also had better outcomes. Further study is needed to identify the processes within the particular organizations that made their culture favourable to develop a collective 'we can do it' mentality against the odds of resource limitations. The findings should provide practice-focused scholars with some guidance on the role that organizational culture influences practice within agencies and thus outcomes of interest.

There are three key pieces of advice for organizational change that the survey results show for LHD immunization programs. The first item is that LHD immunization programs should research themselves. In regard to ISD, LHDs have always looked at their communities but rarely have looked internally to see how organizational change can improve ISD. Taking stock of staff perspectives on LHD leadership and management and its ISD operations can be helpful when assessing the effectiveness of the LHD's immunization work with the public. This type of assessment can also help leadership and management know what frontline staff are saying about their practices.

The second piece of advice for organizational change is that LHD leadership should respond to comments from frontline staff about how they work, their perspectives on their work, and how they experience the LHD's culture. The high level of commitment of staff suggests that leadership and management could gain by inviting and responding to staff comments. If staff are having negative experiences or do not feel particularly valued or empowered, it would be helpful to acknowledge the issue. Staff feedback is a critical evaluation tool and can be instructive for [on] developing plans to improve organizational culture and, based on survey results, possibly improve childhood immunization coverage rates.

The third key piece for organization change is to focus on staff experiences and skills and not just their academic training. This recommendation comes not as much from the quantitative data as from the qualitative data. Responses from LHDs showed that it was the ability to connect with colleagues and with community partners that helped them "feel" like champions and helped them understand the importance of their role in delivering immunization services.

However, implementation is always much more difficult than making the recommendations for organizational change. After examining the responses to the survey, I think there are several straightforward ways to make these changes happen. Implementation seems feasible, because they are predicated on the input from staff members who have worked in immunization service delivery for years. These recommendations include 1) focus on recruitment and retention of staff from the community that you are serving; 2) build a continuum of full staff engagement so that each staff member is integrated into the full scope of ISD and not isolated to their one operational area (e.g., answering telephone calls or stocking and cataloguing vaccine shipments); and 3) provide staff flexibility for decision-making because many of them have an understanding of the community that ISD leadership may not have. These activities are likely to encourage a shift toward an organizational culture that is transparent and open to feedback for operational improvements or problem-solving. As the survey data show, LHD ISD staff want to reach their goal of fully vaccinating children before their third birthday but need better clarity on how to improve processes that can help them get to the goal. LHD leadership and management need to help make sure that organizational cultures, decisions and procedures particularly at the programmatic level are receptive to a diversity of staff voices, experiences, and perceptions in both tone and substance.

Implications for Future Research

Separating out the interconnectedness of various factors (culture, leadership, and community demographics) that seem to influence immunization coverage rates will require some more work, more interviews, more surveys, and other data collection methods—to figure out

which themes are predicated on other themes. The identification of themes is important because identifying them is an important first step for operational and theoretical research—identification of themes help give scientific research direction and working theories, which in turn help identify factors and elements that predicate phenomena we see in daily practice. Does having robust political support for your activities improve or enhance community partnerships? Do better interagency collaborations do it? Do strategic collaborations help? If so, how? How do agency leadership and management affect organization culture within public health departments? What impact do appointed or elected board of health members have on local public health organizational culture and practice? What impact does organizational leadership and staff perception of themselves as practitioners instead of employees have on the agency's culture and practice environment and, ultimately, on community health outcomes? These are just some of the questions to think about when trying to get some correlations between the qualitative points and coverage rates.

Furthermore, the information collected from the survey can help the total public health system recognize the strengths and effectiveness of the current immunization service delivery system, identify areas for improvement, and develop programs and services to support and improve LHD organizational culture to address the consequences of stressful aspects of the immunization service delivery experience. The study's findings can help in that regard because it adds to the body of knowledge of additional factors that contribute to coverage rate variations and uses the voices of public health workers to explain what these particular factors—organizational culture and leadership—mean to them and their practice.

The findings of this survey can help deepen our understanding about informal and formal leadership with public sector organizations that focus on population health, thereby providing valuable information to help guide public policy-making decisions and actions in the country's efforts to address the needs of public health departments in their vital role.

The quantitative results from this survey further substantiated this assertion and demonstrated the value of LHD immunization programs and services in alleviating the nation's challenge to reach its Healthy People 2020 goal of assuring that at least 90% of American children are fully vaccinated before their third birthday.

Limitations

The study had methodological limitations, including that it targeted all LHDs and those local organizations that deliver immunization services on behalf of the LHD, instead of a randomized representative sample. In light of this, the response rate played a specific role. The timing of the launch of the survey link was also a limitation. August is when many LHDs are planning for back-to-school vaccination programs in local schools. It is very likely that many LHDs did not complete the survey due to competing time commitments. I based much of my quantitative questioning on a qualitative study that was based on a convenience sample of LHDs, which did not necessarily reflect the breadth of LHDs in the U.S. The qualitative method, however, was an effective tool for developing a preliminary understanding of the complexities of health department organizational factors and how they impact public health practice. However, the quantitative assessment of LHD organizational factors gives a clearer idea of how

organizational factors interact with external community aspects to affect community health outcomes.

Another limitation is that, in hindsight, I should have surveyed a broader range of staff within immunization programs. This would allow for a deeper understanding of perceptions of what is working and what remain challenges within the program to deliver ISD. Characterizing how a broader range of immunization staff experience the LHD's culture could also have given a more in-depth perspective on organizational linkages, both internal and external. It would also illuminate the organizational politics that impact the culture and reveal how staff experience the organization's culture.

Summary

Multiple entities—the Centers for Disease Control and Prevention, academic centers, and policy institutes—have studied variations in childhood immunization coverage rates. Most have focused on external influences on these variations, including familial income, maternal education levels, insurance coverage, access and utilization challenges, and other factors (Dombkowski, 2001). However, very few have examined the institutions that are responsible for delivering immunization services to this particular population. Agency influences on a health outcome is significant to consider because of the shift in the patient population. In the 21st century, most children, irrespective of income, age of parents, nature of the household (single parent), insurance status, income, race, ethnicity; receive recommended vaccines either in the public sector or in the private sector with vaccines that were purchased with public dollars (IOM, 2003).

I gathered information from LHDs across the U.S. that provide childhood immunization services. It gathered information from a broad cross-section of these agencies, thus the data captured can be construed as being from typical LHDs and other agencies and thereby offer knowledge, insight, and findings that can be generalized. For this study, I used a broad-spectrum definition of organization culture—drawing from the writings of Schein, Durkheim, and Benedict—to construct for myself and readers exactly what I sought to measure within this study, culture as an agency "factor" that influences a key community health outcome—childhood immunization coverage rates.

A total of 351 LHDs completed the online survey that was used for this study. The respondents were individuals who had primary responsibility for administering their LHD's immunization program. I modified an existing organizational culture measurement tool, the Organizational Management Survey, which has been used in multiple health care settings, ranging from emergency rooms at hospitals to palliative care units at nursing homes. The Organizational Management Survey divides the overarching construct into specific organizational culture dimensions: leadership, staff cohesion, rewards, problem-solving, communication, coordination, and ways culture is experienced. The Organizational Management Survey was used to determine the basic cultural patterns of each responding agency. Scores from the survey were analyzed according to the various methods outlined in Chapter III of this study. Two factors—organizational culture and organizational leadership - emerged from the PCA of the modified Organizational Management Survey items. I combined these two factors with the LHD demographic variables to conduct a regression analysis to create a model that might

determine which of them, if any, influenced the outcome of interest for this study. After conducting the HRA, the output showed that two variables influenced childhood immunization rates—Organizational Culture and Type of LHD. The items that were included in Organizational Culture are outlined in Table 4.2 in Chapter IV.

The study's findings reinforced earlier findings from the qualitative ILA conducted in 2008. Participants in the qualitative study described how they experienced their agency's culture. From Table 3.2, the analyses of the transcripts showed that success factors were related to organizational culture: 1) credibility with the community; 2) positive connections to political bodies that they can leverage to improve service delivery; 3) strong engagement with the community; and 4) having ample resources to help them do their jobs.

Type of LHD was the other variable that helped with the model to predict immunization coverage rates, although much less so than organizational culture. Because most of the respondents were small LHDs (defined as serving a population of <50,000 persons), I assumed that many of them are in rural or suburban jurisdictions. These jurisdictions are more likely to outsource their immunization services to community partners such as community health centers or visiting nurses associations. Also, these entities, while listed as LHDs are often rural or federally qualified health centers. (Many of these agencies are allowed to cross list themselves as multiple entities—LHD, FQHC, RHC—because they are often the only sources of care in their area, as noted in Chapter I (National Association of Community Health Centers, 2010).

Results from the Survey provided detailed information that: described the immunization program management population who deliver services from the country's LHDs; expanded

understandings about the importance of this population in delivering a linchpin service to a vulnerable population; and detailed the role that the type of agency they work within, the operational culture of that agency, and the impact those two factors have on the quality and effectiveness of the immunization services they deliver to their communities.

The qualitative and quantitative portions of the study found three important things. First, that public health organizations differ in a measurable way in their dominant cultural orientation; second, that this cultural orientation is associated with immunization service delivery effectiveness; and third, that if we want to understand relationships between culture and performance within public health, we need to more closely examine the local social systems at the heart of what these LHDs do and how they do it.

The organization's size and the resources available might be an important factor in outcomes. Often, larger LHDs have access to more resources due to having more money. However, smaller organizations appear to collaborate better and form strong liaisons to address childhood immunization coverage rates. Smaller organizations must rely on a smaller employee pool, limited space, and be more creative with the building and planning for their immunization programs. So the culture within those organizations and how they use it to liaise with partners in the community becomes very critical.

The theory and practice of public health have been challenged to build a new model for leadership and service delivery. Those efforts require an understanding of culture—of the agency itself (internal) as well as the communities they serve (external). Organizational culture acknowledges the challenges and the changing organizational dimensions as complex indicators

to influence health outcomes in communities. In theory, organizational culture is a malleable construct that can result in concrete actions and recommendations to help improve immunization service delivery, vaccination coverage rates amongst children, and to help them practice within an ever-changing environment.

Appendix

Appendix A

Evolution of Recommended Childhood Immunizations.

FIGURE 1. Recommended immunization schedule for persons aged 0–6 years — United States, 2008 (for those who fall behind or start late, see the catch-up schedule [Table])

Age ▶ / Vaccine ▼	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B[1]	HepB	HepB		See footnote 1	HepB						
Rotavirus[2]			Rota	Rota	Rota						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	See footnote 3	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	*Hib*[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPV	
Inactivated Poliovirus			IPV	IPV	IPV						IPV
Influenza[6]					Influenza (Yearly)						
Measles, Mumps, Rubella[7]						MMR					MMR
Varicella[8]						Varicella					Varicella
Hepatitis A[9]						HepA (2 doses)				HepA Series	
Meningococcal[10]										MCV4	

Range of recommended ages

Certain high-risk groups

TABLE 1. Recommended childhood immunization schedule *+ -- United States, January 1995

Vaccine	Birth	2 Months	4 Months	6 Months	12 & 15 Months	15 Months	18 Months	4 - 6 Years	11-12 Years	14-16 Years
Hepatitis B @	°- HB-1 -°	°- HB-2 -°		°- HB-3 -°						
Diphtheria-Tetanus-or °- Td-° Pertussis (DTP) ** DTaP		DTP	DTP	DTP	°- DTP -°			°- or DTaP >= at 15 months -°		DTP
Haemophilus influenzae type b ++		Hib	Hib	Hib	°- Hib -°					
Poliovirus		OPV	OPV	°- OPV -°						OPV
Measles-Mumps-or MMR Rubella &&					°- MMR -°					MMR

TABLE 1. Recommended schedule for active immunization of normal infants and children (See individual ACIP recommendations for details.)

Recommended age*	Vaccine(s)†	Comments
2 mo.	DTP-1,§ OPV-1¶	Can be given earlier in areas of high endemicity
4 mo.	DTP-2, OPV-2	6-wks-2-mo. interval desired between OPV doses to avoid interference
6 mo.	DTP-3	An additional dose of OPV at this time is optional for use in areas with a high risk of polio exposure
15 mo.**	MMR††	
18 mo.**	DTP-4, OPV-3	Completion of primary series
4-6 yr.§§	DTP-5, OPV-4	Preferably at or before school entry
14-16. yr	Td¶¶	Repeat every 10 years throughout life

*These recommended ages should not be construed as absolute, i.e. 2 mos. can be 6-10 weeks, etc.

†For all products used, consult manufacturer's package enclosure for instructions for storage, handling, and administration. Immunobiologics prepared by different manufacturers may vary, and those of the same manufacturer may change from time to time. The package insert should be followed for a specific product.

§DTP—Diphtheria and tetanus toxoids and pertussis vaccine.

¶OPV—Oral, attenuated poliovirus vaccine contains poliovirus types 1, 2, and 3.

**Simultaneous administration of MMR, DTP, and OPV is appropriate for patients whose compliance with medical care recommendations cannot be assured.

††MMR—Live measles, mumps, and rubella viruses in a combined vaccine (see text for discussion of single vaccines versus combination).

§§Up to the seventh birthday.

¶¶Td—Adult tetanus toxoid and diphtheria toxoid in combination, which contains the same dose of tetanus toxoid as DTP or DT and a reduced dose of diphtheria toxoid.

1983 childhood immunization schedule

Appendix B

2008 Data From the National Immunization Survey (NIS)

Among Children 19-35 Months of Age by State and Local Area US, National Immunization Survey, Q1/2008-Q4/2008[†]

	4+DTaP[‡]	3+Polio[§]	1+MMR[‖]	3+Hib[¶]	3+HepB[**]	1+HepB 3 day[††]	1+Var[‡‡]	4+PCV7[§§]	2+HepA[‖‖]	4:3:1:3:3[¶¶]	4:3:1:3:3:1[***]	4:3:1:3:3:1:4[†††]
US National	84.6±1.0	93.6±0.6	92.1±0.7	90.9±0.7	93.5±0.7	55.3±1.3	90.7±0.7	80.1±1.1	40.4±1.2	78.2±1.1	76.1±1.1	68.4±1.2
Alabama	83.1±5.8	92.1±4.0	93.6±3.8	91.3±4.0	91.0±4.2	66.5±5.8	92.9±3.9	76.3±6.2	33.9±6.0	76.3±6.1	75.1±6.1	67.2±6.5
Alaska	79.2±6.0	91.9±3.8	88.4±5.0	89.6±4.1	93.1±3.5	64.6±6.9	77.8±6.4	77.6±6.0	48.7±7.4	76.2±6.3	69.2±6.9	63.4±7.1
Arizona	84.6±5.6	92.4±4.2	92.2±4.4	91.5±4.0	94.2±3.0	81.4±4.9	91.1±4.4	79.0±6.2	48.1±7.0	79.2±6.1	76.4±6.3	69.1±6.6
Arkansas	81.4±5.7	91.6±4.2	92.2±4.1	89.3±5.0	94.3±3.1	73.8±6.6	90.0±5.0	74.8±6.2	22.4±5.6	78.0±5.9	75.5±6.4	64.9±6.8
California	86.8±3.5	95.7±2.0	92.7±2.8	94.1±2.3	94.7±2.5	36.3±5.0	92.4±2.7	83.0±3.9	48.2±5.1	80.6±4.1	78.7±4.2	70.5±4.7
CA-Los Angeles County	86.5±4.3	95.6±2.4	91.1±3.6	93.5±2.9	95.8±2.3	32.4±5.9	92.2±3.2	80.2±5.1	52.6±6.2	78.6±5.1	76.2±5.3	67.6±5.9
CA-Northern CA	76.5±6.0	90.9±4.1	87.7±4.6	89.8±3.9	92.1±3.5	14.2±5.0	85.9±4.9	69.2±6.5	29.8±6.9	70.8±6.4	68.5±6.5	58.1±7.0
CA-Santa Clara County	90.6±4.4	95.9±2.8	93.7±3.3	91.4±5.6	97.3±2.5	70.4±7.4	90.8±4.4	85.3±5.2	51.6±8.2	84.1±6.4	80.9±6.7	73.6±7.3
CA-Rest of State	87.0±5.0	95.8±2.9	93.5±3.9	94.7±3.2	94.1±3.7	36.0±7.1	92.9±3.9	84.4±5.5	46.6±7.3	81.4±5.8	79.9±5.9	71.8±6.7
Colorado	86.5±6.1	94.9±2.9	92.3±5.4	87.3±6.1	94.6±3.2	48.7±8.9	90.1±5.6	82.5±6.5	42.4±9.0	80.7±6.7	79.4±6.8	74.3±7.3
Connecticut	88.2±4.5	99.5±0.6	95.3±3.1	82.6±6.2	98.1±1.6	63.2±7.2	93.2±4.0	91.5±3.9	38.8±7.6	72.5±7.0	69.8±7.2	66.0±7.4
Delaware	84.3±6.0	91.8±4.7	93.1±4.5	87.5±4.8	96.0±2.7	58.6±7.2	94.4±2.9	79.8±6.3	44.6±7.1	73.0±6.8	71.8±6.8	63.9±7.0
District of Columbia	84.6±5.5	89.7±4.4	89.7±4.4	90.7±4.6	92.8±3.7	61.7±7.1	90.4±4.2	78.8±5.7	43.4±7.3	78.6±6.4	77.6±6.4	68.8±6.9
Florida	88.5±4.0	92.9±3.0	91.7±3.5	92.0±3.3	94.8±2.5	40.7±6.7	90.7±3.7	78.9±5.1	40.6±6.4	81.8±4.6	79.9±4.8	71.0±5.5
FL-Miami-Dade County	87.1±5.7	91.8±4.6	88.6±5.1	93.2±4.3	95.4±2.7	26.5±6.6	87.8±5.3	67.0±8.7	26.5±6.7	79.8±6.3	77.7±6.5	59.2±8.6
FL-Orange County	87.2±5.8	95.1±3.6	91.2±4.6	93.5±3.9	95.5±2.8	55.3±8.0	92.9±3.5	79.4±7.1	31.9±7.4	81.7±6.2	79.1±6.5	69.8±7.8
FL-Rest of State	88.8±5.0	92.9±3.7	92.3±4.3	91.7±4.1	94.6±3.1	42.0±8.4	91.1±4.7	81.1±6.3	44.1±8.0	82.2±5.8	80.3±6.0	73.3±6.8
Georgia	79.0±6.7	93.1±3.5	92.7±3.7	86.1±5.1	93.6±3.7	65.8±7.0	90.6±4.8	81.6±5.8	42.7±7.1	72.7±6.9	71.9±6.9	67.4±7.1
Hawaii	81.5±6.6	92.8±3.8	94.8±2.9	89.4±4.4	91.2±5.3	68.3±7.2	92.6±4.1	84.1±6.0	43.6±7.4	78.3±6.7	77.4±6.8	74.4±6.9
Idaho	77.6±5.9	91.8±3.7	86.1±5.4	77.6±6.0	93.3±3.4	64.0±6.6	80.7±5.8	74.8±6.3	38.6±6.5	65.9±6.6	60.4±6.8	54.2±6.7
Illinois	82.2±4.2	92.4±2.7	91.0±2.7	92.7±2.3	94.7±2.1	56.4±5.1	88.3±3.3	76.2±4.8	26.2±4.1	78.1±4.3	74.8±4.6	65.0±5.1
IL-City of Chicago	84.2±5.9	92.2±3.7	89.0±3.7	89.1±4.5	93.3±3.6	75.0±5.8	89.2±3.6	76.0±6.4	36.2±6.4	79.7±6.2	78.1±6.2	70.4±6.6

IL-Madison/St. Clair coun.	82.3±5.6	93.2±3.4	90.5±4.0	90.3±4.1	95.8±2.5	74.8±5.5	88.5±4.4	81.0±5.5	33.6±6.3	77.3±5.8	74.9±6.0	68.4±6.4
IL-Rest of State	81.5±5.5	92.4±3.6	91.7±3.6	94.1±2.7	95.2±2.7	48.6±6.8	88.0±4.5	76.0±6.3	22.2±5.3	77.5±5.7	73.6±6.1	62.9±6.7
Indiana	85.3±4.7	95.2±2.6	88.0±4.8	89.3±4.2	95.6±2.6	64.5±7.3	87.9±4.6	79.5±6.0	42.1±7.6	78.4±5.8	75.5±6.1	70.3±6.6
Iowa	84.2±5.3	92.3±3.8	91.4±4.4	88.4±4.5	93.5±3.3	31.4±6.1	87.8±4.8	81.6±5.5	38.6±6.6	77.3±5.8	74.7±6.0	67.2±6.4
Kansas	85.7±5.2	95.4±2.8	91.9±3.6	93.7±3.0	94.4±3.1	68.1±6.7	90.1±4.7	80.7±5.2	37.4±7.2	78.2±5.9	76.7±5.9	69.5±6.5
Kentucky	86.0±4.9	94.1±3.2	90.2±4.4	86.3±5.3	92.7±4.0	74.4±6.2	87.7±5.0	79.6±5.6	33.9±6.4	76.8±6.0	74.1±6.4	66.4±6.7
Louisiana	87.7±4.0	97.0±2.0	94.2±2.5	92.9±3.2	95.3±2.6	62.3±6.2	95.0±2.4	78.0±5.5	46.6±6.6	83.0±4.5	81.9±4.6	72.5±5.7
Maine	90.3±3.7	95.4±2.6	91.8±3.6	86.1±4.6	91.4±3.6	66.8±6.1	90.1±3.8	84.3±5.1	16.8±4.9	76.2±5.5	73.6±5.6	66.5±6.2
Maryland	89.1±4.1	95.6±2.4	94.5±2.4	93.9±2.7	93.5±3.2	67.8±5.7	92.2±2.9	84.3±4.6	46.2±6.2	82.6±4.8	80.2±4.9	73.6±5.7
MD-City of Baltimore	88.6±4.3	94.5±3.2	89.9±4.1	88.7±4.4	95.8±2.4	64.5±7.1	87.5±5.0	81.8±5.6	36.3±6.8	78.6±5.6	74.6±6.0	68.2±6.4
MD-Rest of State	89.1±4.6	95.7±2.7	95.2±2.7	94.7±3.0	93.2±3.6	68.2±6.4	92.9±3.2	84.7±5.2	47.6±7.0	83.1±5.4	81.0±5.6	74.3±6.4
Massachusetts	87.2±5.0	98.2±1.5	94.4±4.2	98.4±1.4	96.8±2.4	66.8±7.3	95.3±2.5	88.0±4.7	39.6±7.5	83.9±5.5	82.3±5.6	76.2±6.3
Michigan	86.4±5.3	93.8±3.2	88.1±4.5	87.3±4.8	93.9±3.0	75.7±6.2	87.4±4.8	82.5±5.7	29.1±6.0	76.8±6.3	74.5±6.5	69.8±6.8
Minnesota	87.3±4.2	96.0±2.2	91.8±3.5	85.8±4.3	94.6±2.9	21.7±5.5	90.1±3.5	79.2±5.2	35.4±5.9	77.4±5.1	74.6±5.3	66.8±5.8
MN-Twin Cities	86.4±5.9	94.4±3.6	92.3±4.1	82.5±6.1	94.1±3.5	10.6±4.8	89.9±4.7	80.0±6.3	40.2±7.1	77.9±6.4	75.2±6.7	68.5±7.0
MN-Rest of State	88.4±6.0	98.2±2.0	91.2±5.9	90.0±5.6	95.3±4.8	NA	90.4±5.2	78.2±8.6	NA	76.9±8.4	73.8±8.7	64.7±9.8
Mississippi	82.4±5.2	93.7±3.1	89.3±4.2	83.0±5.8	95.7±2.4	67.3±5.9	92.1±3.7	74.7±6.4	27.3±5.4	76.5±6.3	75.8±6.3	68.9±6.5
Missouri	82.0±5.2	91.7±4.1	91.7±4.1	89.0±4.5	91.1±4.2	56.2±6.6	88.1±4.5	74.8±5.8	36.7±6.4	76.0±5.7	72.9±6.4	61.5±6.7
Montana	74.4±6.2	88.5±5.1	85.9±5.1	81.1±5.6	86.6±5.4	66.4±6.6	77.7±6.0	71.7±6.4	23.2±5.6	65.5±6.6	59.2±6.8	56.0±6.8
Nebraska	84.9±4.5	92.5±3.7	91.9±3.3	83.0±4.9	92.9±3.4	31.0±6.0	89.2±3.8	77.5±5.6	52.2±6.5	74.8±5.6	71.5±5.8	63.0±6.3
Nevada	76.0±6.0	89.9±4.2	88.0±4.4	85.2±4.9	84.9±4.9	65.5±6.6	86.8±4.7	63.6±6.7	45.9±7.0	70.1±6.3	67.8±6.5	54.2±7.0
New Hampshire	90.0±4.1	95.0±2.9	94.8±3.0	95.6±2.7	94.9±2.8	69.0±6.0	91.3±3.5	86.6±4.6	41.0±6.6	85.0±4.8	81.0±5.2	74.6±5.9
New Jersey	80.6±5.8	89.6±4.5	89.9±4.4	94.7±3.5	92.0±4.0	44.9±7.1	85.9±4.8	74.8±6.3	29.3±5.9	72.8±6.1	68.5±6.3	59.7±6.5
New Mexico	85.2±5.5	91.3±4.6	90.6±4.4	89.0±4.8	91.3±4.5	52.3±7.6	89.3±4.6	83.3±5.6	36.2±7.2	79.1±6.0	77.0±6.1	72.9±6.4
New York	84.4±3.4	94.6±2.2	92.2±2.4	91.0±2.6	92.7±2.5	34.4±4.8	88.2±3.1	80.2±3.8	32.9±4.6	76.2±3.9	73.3±4.2	65.1±4.5
NY-City of New York	86.0±4.5	94.7±2.8	93.4±3.1	90.2±3.7	93.2±3.3	35.8±6.8	90.6±3.8	78.3±5.4	36.4±6.6	77.3±5.4	75.4±5.8	66.6±6.4
NY-Rest of State	83.0±5.1	94.5±3.4	91.2±3.6	91.7±3.7	92.3±3.8	33.1±6.7	85.8±5.0	82.0±5.3	29.6±6.4	75.2±5.7	71.3±6.1	63.7±6.5
North Carolina	84.1±5.7	94.6±3.2	92.2±3.6	83.6±5.6	93.6±3.8	72.2±6.3	92.3±3.7	82.6±5.9	35.7±6.1	72.4±6.3	70.8±6.3	64.4±6.6
North Dakota	81.0±5.5	95.1±2.6	90.6±3.9	85.2±4.8	95.5±2.5	72.0±5.9	85.0±4.6	80.9±5.4	45.3±6.5	74.2±5.9	69.8±6.1	65.5±6.3
Ohio	86.1±5.9	96.5±2.1	93.9±3.1	95.2±4.7	92.9±5.0	64.7±7.0	93.3±3.1	78.6±6.4	36.1±6.7	82.9±6.1	81.8±6.1	71.5±6.8
Oklahoma	78.7±6.6	88.4±5.6	92.3±4.2	86.3±5.8	90.3±4.9	61.4±6.8	90.5±4.4	65.7±7.5	49.6±7.1	73.6±6.8	71.7±6.9	56.4±7.5
Oregon	79.7±6.5	94.8±3.2	92.0±3.8	87.2±5.9	92.6±3.7	41.8±7.7	90.4±4.0	79.4±7.0	40.2±7.6	72.3±7.3	71.0±7.4	68.3±7.5
Pennsylvania	88.1±3.9	94.1±3.3	92.2±3.0	91.6±3.5	92.6±3.6	67.0±5.5	92.4±3.0	83.8±4.4	51.7±5.7	80.4±4.9	77.7±5.0	71.3±5.4
PA-Philadelphia County	84.5±4.8	95.8±2.4	93.1±3.3	94.8±2.8	97.1±1.7	75.0±5.6	93.6±3.1	79.7±5.2	49.4±6.2	81.5±5.0	79.5±5.2	71.6±5.7

PA-Rest of State	88.8±4.5	93.8±3.9	92.0±3.6	91.0±4.1	91.8±4.3	65.5±6.4	92.2±3.5	84.6±5.2	52.1±6.7	80.2±5.7	77.4±5.9	71.2±6.4
Rhode Island	88.4±4.7	97.1±2.6	93.7±3.5	89.0±4.2	97.0±2.1	69.4±7.1	93.0±4.0	83.9±6.4	57.4±7.8	79.5±5.8	77.5±6.1	68.6±7.4
South Carolina	84.7±5.1	94.6±3.3	88.5±4.6	90.2±4.1	95.8±2.7	62.8±6.8	89.2±4.5	80.5±5.7	37.4±6.4	78.8±5.4	78.4±5.4	70.6±6.1
South Dakota	84.3±5.1	94.5±3.7	93.7±3.2	91.2±4.3	95.0±3.5	40.5±6.6	90.1±3.8	73.0±5.9	27.5±5.7	80.8±5.4	77.4±5.7	62.7±6.4
Tennessee	87.7±4.5	94.6±3.4	95.6±3.0	92.8±3.7	92.2±4.5	35.8±6.4	92.7±3.6	85.7±4.6	47.9±7.0	83.1±5.3	81.2±5.4	73.6±6.0
Texas	83.0±4.5	92.1±3.7	93.7±2.5	92.7±3.5	93.0±3.5	66.6±5.5	93.1±2.6	79.2±5.1	49.1±5.6	78.6±4.7	77.8±4.7	70.5±5.4
TX-Bexar County	80.5±6.2	92.9±4.1	92.8±3.9	93.0±4.1	95.7±3.1	63.2±6.8	95.4±3.0	84.3±5.5	51.1±7.5	77.2±6.5	76.0±6.6	70.9±6.9
TX-City of Houston	81.2±6.1	92.7±3.7	90.8±4.2	90.4±4.5	91.4±4.1	61.2±7.0	90.0±4.6	76.9±6.1	50.8±7.4	73.8±6.6	72.0±6.7	64.1±7.0
TX-Dallas County	81.8±5.3	89.4±4.0	91.4±3.9	91.1±3.7	86.4±5.1	68.2±6.4	88.9±4.3	76.9±5.9	46.8±6.9	74.9±6.2	74.2±6.2	69.0±6.5
TX-El Paso County	80.7±4.9	93.3±2.9	93.0±2.8	95.1±2.5	95.3±2.4	84.5±4.6	92.5±3.0	77.2±5.4	63.4±6.2	76.5±5.3	74.9±5.4	66.8±6.0
TX-Rest of State	83.8±6.7	92.4±5.5	94.7±3.6	93.3±5.2	94.1±5.3	66.6±8.2	94.3±3.7	79.7±7.6	48.1±8.3	80.4±6.9	79.8±6.9	72.1±7.9
Utah	83.1±6.9	89.0±5.8	90.8±4.9	90.6±5.2	91.7±4.5	78.6±6.7	92.7±4.1	76.3±7.6	41.6±8.2	78.1±7.2	76.6±7.3	65.5±8.2
Vermont	79.8±5.9	91.3±4.1	88.1±4.6	92.6±4.1	92.2±3.5	19.1±6.3	77.0±6.0	84.1±5.3	32.8±6.7	74.4±6.3	64.5±6.8	60.8±7.0
Virginia	80.3±7.7	89.9±5.5	92.3±5.2	92.6±5.5	92.8±4.9	42.2±8.7	93.0±4.8	81.7±7.2	34.3±8.0	73.2±8.3	72.9±8.3	68.1±8.6
Washington	82.7±5.0	88.7±4.1	91.2±3.5	89.6±3.9	88.8±3.9	72.6±5.3	86.8±4.1	77.2±5.5	36.0±5.8	77.7±5.3	73.5±5.8	67.3±6.2
WA-Eastern/Western WA	83.6±5.1	89.2±3.9	89.6±4.0	91.3±3.6	89.6±3.9	71.8±6.3	86.4±4.7	78.1±5.6	31.6±6.4	78.7±5.6	75.6±5.8	68.7±6.4
WA-Rest of State	82.3±6.8	88.5±5.6	91.9±4.7	88.8±5.3	88.4±5.4	73.0±7.1	87.0±5.6	76.9±7.5	37.8±7.9	77.3±7.2	72.6±7.9	66.7±8.5
West Virginia	84.8±5.5	94.5±2.9	88.3±5.0	94.1±3.2	96.1±2.3	55.3±7.2	89.3±4.8	72.4±7.1	34.8±6.2	78.0±6.0	76.5±6.0	62.8±7.3
Wisconsin	88.2±5.7	94.1±4.0	94.3±3.9	88.3±5.4	94.8±3.9	55.8±7.6	88.3±5.3	84.9±5.8	37.2±7.1	83.6±6.1	79.6±6.5	72.6±7.2
Wyoming	73.7±5.9	90.7±3.9	87.6±4.3	80.7±5.4	91.2±3.8	63.5±6.4	84.6±4.6	69.2±6.2	28.2±6.0	67.6±6.3	64.6±6.4	56.2±6.6

Appendix C

Kindergarten Retrospective Survey Form.

REQUIRED SCHOOL IMMUNIZATION STATUS REPORT FOR SCHOOL YEAR 2009-2010 (RCW 28A.210.110)

Please read instructions below and on the back of this form before completing it.

NOTE: This form is ONLY for school-age students (K-12) enrolled in school on the date the report is prepared.

Health

Please complete and submit your report online by November 1, 2009 at:
https://fortress.wa.gov/doh/immenu

Or mail this completed report by Nov 1, 09 to:
Washington State Department of Health
Immunization Program CHILD Profile
111 Israel Rd. SE, 3rd Floor
PO Box 47843
Olympia, WA 98504-7843

Fax reports are no longer accepted.

If you have questions, please call 1-866-397-0337, (360) 236-3565 or (360) 236-3527.

PART A: ALL SCHOOLS - PLEASE COMPLETE

School Name:

Mailing Address:

City, State, Zip:

County:

District:

Check all that apply:

☐ New School
☐ Name change (Previous Name_____)
☐ Closed

Date:

At this school, we have the following grades from: to:

Completed by:

Phone:

Do you track student immunizations on a computer system?
☐ Yes ☐ No If yes, write System Name:

Check all that apply:
☐ Inactive/temporary closure
☐ No immunization records kept on site/students accounted for on report for their school of registry
☐ Juvenile detention center/Residential treatment

PART B: ALL SCHOOLS - PLEASE COMPLETE

NUMBER OF STUDENTS ENROLLED K - 12	TOTAL NUMBER OF STUDENTS EXEMPT	NUMBER OF STUDENTS EXEMPT BY CATEGORY			ENTER TOTAL NUMBER OF STUDENTS K – 12 EXEMPT FOR EACH VACCINE											
		MEDICAL	PERSONAL	RELIGIOUS	DIPHTHERIA/ TETANUS	PERTUSSIS	POLIO	MEASLES		MUMPS		RUBELLA		HEP B	VARICELLA	
	4	1	2	3	A	B	C	D#1	D#2	E#1	E#2	F#1	F#2	G	H#1	H#2

Box 4 = 1 + 2 + 3. Total of A + B + C + D#1 + D#2 + E#1 +E#2 + F#1 + F#2 + G + H#1 + H#2 must be equal to or greater than box 4.

PART C: PLEASE COMPLETE ONLY FOR ENTRY LEVEL (KINDERGARTEN OR FIRST GRADE) AND 6TH GRADE.

GRADE LEVEL	SECTION 1	SECTION 2				SECTION 3										
	ENROLLMENT	IMMUNIZATION STATUS				ENTER THE TOTAL NUMBER OF STUDENTS WHOSE STATUS IS EXEMPT, CONDITIONAL OR OUT OF COMPLIANCE FOR EACH VACCINE.											
	NUMBER OF STUDENTS ENROLLED	NUMBER COMPLETE/IMMUNE	NUMBER EXEMPT	NUMBER CONDITIONAL	NUMBER OUT OF COMPLIANCE	DIPHTHERIA/ TETANUS	PERTUSSIS	POLIO	MEASLES		MUMPS		RUBELLA		HEP B	VARICELLA	
ENTRY LEVEL ONLY	5	1	2	3	4	A	B	C	D#1	D#2	E#1	E#2	F#1	F#2	G	H#1	H#2
6TH GRADE ONLY	5	1	2	3	4	A	B	C	D#1	D#2	E#1	E#2	F#1	F#2	G	H#1	

Box 5 = 1 + 2 + 3 + 4. Total of A + B + C + D#1 + D#2 + E#1 +E#2 + F#1 + F#2 + G + H#1 + H#2 must be equal to or greater than boxes 2 + 3 + 4.

(Continue on the other side)

EXPLANATIONS

PART A – This section is to be completed by ALL schools.	
SCHOOL	Name of the school for which this form is being completed. Normally this will be the school whose name is preprinted on the form. If you copy a preprinted form for use by another school, please mark out the preprinted name. Indicate if there is a school name change from the previous year.

PART B – This section is to be completed by ALL schools.	
TOTAL NUMBER ENROLLED	Total number of students in all grades in this school on the day this report is prepared.
TOTAL NUMBER STUDENTS EXEMPT	Total number of students in all grades with signed exemptions on their Certificate of Immunization Status (CIS) forms. Each one of these exemptions must be classified in the next section as being either medical, personal or religious. Each exemption must then be detailed by the vaccine for which the exemption was made.
NUMBER OF STUDENTS EXEMPT BY CATEGORY MEDICAL PERSONAL/PHILOSOPHICAL RELIGIOUS	Number of students with a signed medical exemption on his/her CIS form. Number of students with a signed personal/philosophical exemption on his/her CIS form. Number of students with a signed religious exemption on his/her CIS form.
NUMBER OF STUDENTS EXEMPT FOR EACH VACCINE	Number of students according to which vaccine(s) they are exempt. A student must be counted for each vaccine series not completed for which an exemption has been signed.

PART C – This section is to be completed ONLY for entry level (kindergarten OR first grade) and 6th grade students.	
SECTION 1: Enter the number of students enrolled for entry level and 6th grade at the school on the date the report is prepared.	
SECTION 2: All entry level and 6th grade students must be accounted for in one of the four following Immunization Status Categories. The sum of all the categories in SECTION 2 must equal the number given in SECTION 1 (this means that # complete/ immune + # exempt + # conditional + # out of compliance = # of students enrolled).	
1. NUMBER COMPLETE/IMMUNE	Number of students who have presented a signed CIS form showing sufficient immunization dates to meet the schedule listed below or documented immunity.
2. NUMBER EXEMPT	Number of students who have presented a signed CIS form certifying that he/she is exempt for any or all vaccines for medical, religious or personal reasons.
3. NUMBER CONDITIONAL	Number of students who have presented a signed CIS form with proof of initiation or continuation of a schedule of immunizations, but who do not meet the requirements, but are within the recommended interval for the next dose. Determine what doses are needed. Request documentation as additional doses are received.
4. NUMBER OUT OF COMPLIANCE	Number of students whose immunization status is exempt, conditional or not complete. A student is considered out of compliance if he/she has not presented a signed, completed CIS form. Out of compliance students should be excluded from school until they meet the requirements.
SECTION 3: For those students indicated in SECTION 2 as being exempt, conditional or out of compliance (see above for definitions), please tally the specific immunization totals and enter them in the appropriate boxes in SECTION 3.	

For more information, please refer to the "Vaccines Required for School Attendance, Grades K-12" chart.

DOH 348-002 (Rev 3/31/09)

Appendix D

Letter to Health Officials

TO: Local Health Directors

FROM: James Ransom, Antioch University
Representative, NACCHO

DATE: XXX

SUBJECT: Survey of local health departments regarding immunization service delivery

We are writing to ask for your help in supporting completion of an online survey of local immunization service delivery (ISD) within local health jurisdictions (LHJs) across the country.

This survey project was developed with the goal of better understanding management of ISD at the local level and will serve to complement the various CDC-sponsored reports and assessments of ISD within state health departments because application of ISD may be highly variable and may depend upon many different factors.

State and local statutes provide the authority to conduct ISD activities; however information is lacking on the specific practices related to local management of ISD based on these legal authorities. We plan to characterize the policies and procedures LHJs use to implement their ISD and believe this information will benefit the larger group of LHJs. This is particularly important given the decreasing resources for public health in the current economic climate and the potential for policy implications for other population-based health services. We are aware of no similar project performed elsewhere.

The information collected by this survey will help all levels of governmental public health identify areas where standardization of practices or standardized guidance would be desirable, and if so, the information provided by respondents will help inform the development of such guidelines. Secondary objectives of the survey include identifying and documenting best practices; characterizing potential variations in public health practices across jurisdictions; and identifying common problem areas, challenges, and opportunities for combining resources. This information will also be of use to public health, in general, in developing effective strategies that address current and evolving concerns regarding ISD.

This survey is being sent directly to the local health departments for whom we have contact information. We would be grateful if you could ensure that your immunization program manager or coordinator (or appropriate staff member) has received the below survey link as soon as possible. Please note that depending on your health department structure *your immunization program manager/coordinator may need to consult with other colleagues in your communicable disease sections or public health staff at the state or local level in order to properly complete this survey.*

We plan to keep the survey open to participants for three weeks. One week after the survey has been opened, we will ask you to follow up with non-responding health departments. Please note that results from the survey will be shared with you so that you can disseminate this information.

If you have any questions, please feel free to contact James Ransom at jransom@antioch.edu or XXX at XXX@naccho.org.

SURVEY LINK:

Appendix E

Key Informant Interview Guide

National Association of County & City Health Officials (NACCHO)
Site Visit

General Guidance for Q&A/Discussion Session

General

- What is the general organizational structure of your Immunization Program? How are duties divided, sorted, and assigned? (*Please provide an organization chart if one is available.*)
- Explain the action steps your LHD takes to maintain and improve its ≤2 y/o immunization ratios?
- What are the strengths/weaknesses of your agency's immunization service delivery activities? (*This may include assessments, immunization promotion, education and outreach efforts.*)
- Does your LHD provide immunizations and immunization services free of charge? What's the source of funding to cover immunizations given to those who can't pay?

Social Justice/Health Equity

- Does your health department engage in activities that address issues of ethnic, racial, and socioeconomic disparities in immunization rates for children, adolescents, and/or adults?

Preparedness

- How has the Immunization Program been integrated into your LHD's preparedness efforts?
- Have preparedness plans helped your agency's immunization program?

Immunization Policy

- What can NACCHO do to help your agency become more involved with/informed of policy issues related to immunizations? How closely does your immunization program work with your jurisdiction's political structure?
- Are there state and federal mandates that your health agency have not been able to meet, due to budget constraints?

State and Local Collaborations

- Please describe your department's relationship with the state health department.

- Has your relationship with the state health department been affected by budget cuts or new policies?
    - If yes, how so?

- Do you collaborate with other public health agencies and community partners on immunization promotion/outreach efforts?
    - If yes, what are those activities?

    - If no, are you interested in collaboration?
        - If yes, what has prevented you from collaborating in the past?

School-based Efforts

The groups of people for whom annual influenza immunization is recommended have been growing. This growth is particularly apparent in the number of children who are recommended to receive annual influenza. Some immunizations advocates are advocating for policy which would require that all children (≤18 years old) receive annual influenza immunization. Because of this, many people are interested in learning how to assure children receive influenza immunizations in a timely, convenient, and cost-effective way.

- What is your opinion of the value of school-based influenza immunization clinics?
- What is your opinion of the need for school-based influenza immunization clinics?
- What is your opinion of the potential for school-based influenza immunization clinics?
- What are the opinions of some of your partners?
- What have you done thus far to implement influenza vaccination in schools?
- What has been the response to your efforts from the local government? From the school district? From parents?
- What responses have been helpful? What has not been helpful? What has been surprising or unexpected?

<u>Outreach & Education</u>

- How do you plan to educate and engage your partners?
- How do you plan to educate and engage those who oppose these efforts? (Who are they?)
- Do you have a hotline, website, or other means for receiving questions from and providing answers to the public/parents?

- Do you plan to work with any local or state media outlets for outreach and education to the public? If so, please describe them all.
- How do you plan to educate and engage your local political leadership? Will you use influenza morbidity data to make your case for their political and financial investment in these clinics?
- How do you plan to engage insurers?
- How do you plan to engage and/or collaborate with mass vaccinators?
- Are you seeing an increase in parental hesitancy re: getting their children vaccinated?

Appendix F Nursing Home Survey

5795

Tell us about your Nursing Home

For the statements in **Sections 1 & 2,** please fill in the circle that best reflects your feelings about what is going on at this nursing home (for example, if you wish to answer **I strongly agree** then fill in **SA**).

Facility ID

0	0	2	6	5	0	0	0

I strongly disagree **(SD)**	I disagree **(D)**	I do not agree, and I do not disagree **(N)**	I agree **(A)**	**I strongly** agree **(SA)**

Section 1: Relationships and Communications within the Nursing Home.	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I look forward to working with our staff each day.	O	O	O	O	O
2. It is easy for me to talk openly with our staff.	O	O	O	O	O
3. There is good communication between staff across shifts.	O	O	O	O	O
4. I feel that the information I get is accurate.	O	O	O	O	O
5. I find it enjoyable to talk to other staff.	O	O	O	O	O
6. Staff members are well informed about what is happening during other shifts.	O	O	O	O	O
7. Information passed between staff is accurate.	O	O	O	O	O
8. It is easy to ask for advice from other staff.	O	O	O	O	O
9. When a resident's condition changes, I get the right information quickly.	O	O	O	O	O
10. I take pride in being a part of this team.	O	O	O	O	O
11. The staff has a good understanding of goals for each resident.	O	O	O	O	O
12. There are no delays in relaying information about the care of the residents.	O	O	O	O	O
13. I identify with the goals of this nursing home.	O	O	O	O	O
14. I feel I am a part of this team.	O	O	O	O	O

5795

Tell us about your Nursing Home

Section 2: Teamwork and Leadership

Nursing Leadership: Think of the nurse leadership as people like your Director, Assistant Director or Charge Nurse.

Facility ID

0	0	2	6	5	0	0	0

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Nursing leadership provides strong clinical guidance and advice to the nurses.	O	O	O	O	O
2. Nursing leadership is sensitive to the needs of staff.	O	O	O	O	O
3. Nursing leadership is clear about what they expect from staff.	O	O	O	O	O
4. Nursing leadership encourages nurses to take initiative.	O	O	O	O	O
5. Nursing leadership asks us what we think.	O	O	O	O	O
6. Nurses are certain where they stand with the nursing leadership.	O	O	O	O	O
7. The nursing leadership is in touch with staff views and concerns.	O	O	O	O	O
8. Nursing leadership makes decisions with input from the staff.	O	O	O	O	O
9. Nursing leadership gives staff chances to grow.	O	O	O	O	O
10. Other nursing homes seem to have a high opinion of us.	O	O	O	O	O
11. Working as a team with other departments makes our work easier.	O	O	O	O	O

Appendix G

Permission to Use Nursing Home Survey

Message: RE: Nursing Home Adaptation of CVF

Friday, November 20, 2009 10:49 AM -0500
From: "Cawiezell, Jill R" <jill-cawiezell@uiowa.edu>
Subject: RE: Nursing Home Adaptation of CVF
To: James Ransom
Attachments: Attach0.html 12K
MU Survey Form.pdf 636K

Here is our current tool. If you want to set up time to talk about it is early December just let me know.

From: James Ransom [mailto:jransom@antioch.edu]
Sent: Sunday, November 15, 2009 6:01 PM
To: Cawiezell, Jill R
Cc: Cawiezell, Jill R
Subject: Re: Nursing Home Adaptation of CVF

Excellent. Your other instruments would be very helpful. Thank you for the quick follow-up. JR Ransom/

"Cawiezell, Jill R" <jill-cawiezell@uiowa.edu> writes:
>I am traveling right now and do not have access to our survey
>instruments. We quit using the CVF several years ago due to the
>challenges of scoring, and the tight correlations to our other
>organizational instrument. I would be happy to send you our current
>instrument later in the week, if that would be helpful. Otherwise, I
>can dig out the CVF.
>
>----------From:
>James Ransom [jransom@antioch.edu]
>Sent: Thursday, November 12, 2009 9:46 PM
>To: Cawiezell, Jill R
>Subject: Fwd: Nursing Home Adaptation of CVF
>
>
> Hell,
>
>I'm writing to request permission to use your CVF survey as the basis
>for
>my survey of local health department immunization programs. I am a
>graduate student at Antioch University and will use the results as
>part of
>my dissertation. If you have any questions about my research, please
>contact me via this e-mail or via mobile phone at 202.425.2515.
>Cheers, JR
>Ransom/

Appendix H

Survey

Local Immunization Service Delivery Survey

You are participating in a research project that will study local immunization programs. This project is being funded by XX and is conducted in conjunction with NACCHO. Please read the statements below before starting the survey. The quality of this study depends on your willingness to participate, and I appreciate your time in answering the questions.

The information we gather will help us better understand what services you and your colleagues provide and how we can help agency factors that improve ISD. This survey is the first effort to characterize, nationally, local ISD. Such information will help inform state and federal efforts to inform ISD policy, with information from the places where the "rubber meets the road." It is critical that you answer these questions alone, as group answers can affect the validity of the study. The survey will take between 15 and 25 minutes to complete. Please remember that participation is completely voluntary and that responses will be reported in aggregate. This information will be kept as confidential as legally possible and will be shared only with cooperating public health authorizes. You may have a report of the information collected in this survey is you wish.

All local immunization programs across the country are receiving this survey. If you agree to continue, you will answer questions about leadership within your agency, your attitudes about ISD, and your work environment. Your name will not be included on this form and will never be used in connection with any of the information you submit. You do not have to answer any of the questions that you do not want to answer. However, honest answers to these questions will help us better understand what people think, say, and do in their day-to-day ISD activities.

First, we would like to collect some information about your agency and your role within ISD.

1. Agency Name
2. State

3. Your position title
4. Years employed at the agency
5. Years while employed at agency working specifically on childhood immunization issues
6. Number of employees at your agency who work on childhood immunization issues (please include part- and full-time staff)

Now, think about your agency's work environment. Please click the bubble that best reflects your feelings about your day-to-day work environment as you complete your duties (e.g., if you want to answer I strongly agree, please click on Strongly Agree). After each section, there is an Additional Comments box where you can expand on your answers or provide context for the answers you chose.

Section 1. Your agency						
My agency's work environment is…	Strongly Disagree	Disagree	Tend to Disagree	Neutral	Tend to Agree	Agree	Strongly Agree
… Relaxed and friendly							
… Business-like							
… Formal and structured with lots of rules and policies							
… A competitive place with high productivity							

Additional Comments:

Now, thinking about the leadership at your agency, please click the bubble that best reflects your feelings about leadership at your agency.

Section 2: Your agency's Leadership						
The health director/official is…	Strongly Disagree	Disagree	Tend to Disagree	Neutral	Tend to Agree	Agree	Strongly Agree

…Like a
coach/mentor
…Risk-taking and
innovative
… A good
organizer and
efficient
… Hard-driving,
competitive, and
productive

The agency
leadership
provides strong
guidance to staff
… Is sensitive to
staff needs
…Encourages staff
to take initiative
…Asks what we
think
…Staff are certain
where they stand
with agency
leadership
…Is in touch with
staff views and
concerns
…Gives staff
chances to grow
Other agency
programs seems to
have a high
opinion of us
Working as a team
with other
divisions within
the agency makes
our work easier

Additional Comments:

Now, thinking about the management issues at your agency, please click the bubble that best reflects your feelings about management issues at your agency.

Section 3: Agency Management

Management at my agency is focused on….	Strongly Agree	Disagree	Tend to Disagree	Neutral	Tend to Agree	Agree	Strongly Agree
…Team work and group decision making							
…Individual freedom and allows staff to work in new ways							
…Job security and predictable processes							
…Competition and getting the job done							

Additional Comments:

Now, thinking about the overall work culture in your agency, please click the bubble that best reflects your feelings about the overall work culture in your agency.

Section 4: Agency Work Culture

The overall work culture in my agency…	Strongly Agree	Disagree	Tend to Disagree	Neutral	Tend to Agree	Agree	Strongly Agree
… Promotes loyalty, trust, and commitment							
… Focuses on service delivery							
… Focuses on formal procedures, rules, and policies							
… Focuses on productivity, achieving goals, getting job done							
…Promotes trust, openness, and staff development							
…Emphasizes trying innovative strategies to solve problems							
…Emphasizes tradition, stability, and efficiency							
…Promotes competition, achievement of targets and objectives							
…Focuses on team work and concern for colleagues							
…Develops leaders							
…Focuses on							

being efficient and dependable in providing services …Focuses on having better immunization coverage rates when compared to other agencies

Additional Comments:

Now, thinking about ways you feel about working in your agency's immunization program, please click the bubble that best reflects your feelings.

Section 5. Relationships and communication within the Agency

	Strongly Disagree	Disagree	Tend to Disagree	Neutral	Tend to Agree	Agree	Strongly Agree
I look forward to working with my colleagues							
It is easy for me to talk openly with my colleagues							
There is good communication between staff and leadership							
I feel that the information I get is accurate							
I find it enjoyable to talk with other staff							
It is easy to ask for advice from other staff							
I take pride in being part of this team							
The staff has a good idea and							

understanding of
the goals of ISD
There are no
delays in relaying
information
amongst staff
I identify with the
goals of the
division
I feel that I am
part of the team

Additional Comments:

Thank you for completing the survey. After you have finished reviewing this page, you can submit your answers by clicking on the final submit button. We would like to remind you that all the information you provided will be kept confidential and anonymous and that any identifying information you provided will not be shared. Because you participated, you may be interested in the results. You can indicate your interest in receiving a copy of the preliminary results below. If you have any questions about this survey, please contact James Ransom at jransom@antioch.edu.

Thank you again for your participation.

Click here if you'd like a copy of the preliminary results.

Appendix I

IRB Approval

Dear James Ransom

As Chair of the Institutional Review Board (IRB) for Leadership and Organizational Change, Antioch University, I am granting you approval to conduct your Dissertation titled THE ROLE OF AGENCY IN COMMUNITY HEALTH OUTCOMES: LOCAL HEALTH DEPARTMENTS AND CHILDHOOD IMMUNIZATION COVERAGE RATES. Your study is approved based on the information presented in your Ethics Application, including submitted attachments. Lisa Kreeger, IRB member, has been assigned to your case and will be your contact person for the duration of your project. Please consult with this IRB member if you have any questions regarding the Ethics of your project.

Your study is approved from May 3, 2010 to May 2, 2011. If your data collection should extend beyond this time period, you are required to submit a Request for Extension Application to the IRB.

Your study will be overseen by Dr. Philomena Essed, Chair of your Dissertation Committee. Any variation in procedure in the treatment of the participants must be reported to Dr. Philomena Essed and subsequently approved by the IRB through your submission of a revised Ethics Application.

Sincerely,
Dr. Carolyn Kenny
Chair, IRB Committee
Leadership and Change Program
Antioch University
Office:

Appendix J – PCA Descriptive Statistics

Variable	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Relaxed and friendly	5.47	.064	1.189	-1.131	.130	1.912	.260
Business-like	5.18	.057	1.049	-1.044	.134	2.942	.266
Formal and structured with lots of rules and policies	4.38	.072	1.300	-.196	.134	-.221	.268
Highly productive	5.47	.061	1.129	-1.011	.133	2.287	.265
Is like a coach/mentor	4.84	.078	1.472	-.621	.130	.160	.259
Is risk-taking and innovative	4.50	.071	1.334	-.238	.130	-.024	.259
Is organized and efficient	5.01	.066	1.242	-.734	.130	.976	.259
Is competitive	4.65	.068	1.286	-.319	.130	-.012	.259
Is productive	5.30	.059	1.105	-.806	.130	1.851	.259
Provides strong guidance to staff	4.86	.071	1.327	-.579	.130	.419	.259
Is sensitive to staff needs/concerns	5.08	.068	1.269	-.622	.130	.612	.259
Encourages staff to take the initiative	5.37	.064	1.202	-.973	.130	1.745	.259
Asks what staff members think about work-related issues	5.17	.067	1.266	-.827	.130	1.132	.259
Is in touch with staff views and concerns	4.90	.072	1.353	-.596	.130	.308	.259
Gives staff opportunities to grow and improve skills	5.29	.062	1.174	-.780	.130	1.153	.259
Is one who has a high opinion of his/her staff	5.35	.065	1.216	-.838	.130	1.193	.259
Team work and group decision-making	5.47	.058	1.084	-.728	.130	1.472	.260
Individual freedom	4.65	.061	1.134	.045	.130	.029	.260
Being creative	5.14	.054	1.021	-.386	.130	.828	.260
Job security and predictable processes	4.82	.060	1.124	-.109	.130	-.009	.260
Competition with other community stakeholders to improve immunization coverage rates	4.11	.079	1.484	-.050	.130	-.473	.260
Getting the job done	5.86	.053	1.000	-1.199	.130	3.278	.260
Emphasizes loyalty, trust, and commitment	5.48	.055	1.032	-.782	.131	1.906	.261
Is focused on exceptional service delivery	5.73	.057	1.063	-1.192	.131	2.831	.261

	Mean		Std. Deviation	Skewness		Kurtosis	
Is focused on adhering to specific rules and policies	5.40	.055	1.025	-.758	.131	1.814	.261
Is focused on productivity, achieving goals, and getting the job done	5.65	.051	.957	-1.104	.131	3.984	.261
Promotes a sense of trust, openness, and staff development	5.48	.058	1.073	-.924	.131	1.714	.261
Emphasizes trying innovative strategies to solve problems	5.35	.057	1.071	-.660	.131	1.144	.261
Emphasizes tradition, stability, and efficiency	5.06	.056	1.049	-.384	.131	.744	.261
Promotes competition, achievement of target goals & objectives	4.61	.062	1.151	-.186	.131	.487	.261
Is focused on team work and concern for colleagues	5.49	.058	1.081	-.897	.131	2.090	.261
Is focused on developing leadership skills in staff members	5.08	.062	1.149	-.613	.131	.998	.261
Is focused on achieving better childhood immunization coverage rates compared to neighboring jurisdictions	5.18	.068	1.272	-.396	.131	-.257	.261
I look forward to working with my colleagues	5.76	.054	1.000	-.854	.132	1.748	.263
It is easy for me to talk openly about work-related issues with my colleagues	5.74	.055	1.019	-.918	.132	2.145	.263
There is good communication between staff and management	5.42	.064	1.194	-1.074	.132	1.854	.263
I enjoy talking with my co-workers	5.82	.051	.948	-1.013	.132	2.913	.263
It is easy to ask for advice from other staff	5.76	.055	1.016	-1.049	.132	2.624	.263
I take pride in being a part of the team	5.89	.054	.993	-1.225	.132	3.733	.263
The staff has a good understanding of the goals of the immunization program	5.78	.056	1.033	-1.081	.132	2.450	.263
There are no delays in sharing pertinent information amongst staff	5.50	.058	1.068	-.925	.132	2.058	.263
I identify with the goals of the division	5.73	.052	.969	-1.088	.132	3.689	.263
I feel that I am a significant part of the team	5.96	.052	.966	-1.365	.132	4.616	.263
Valid N (listwise)							

References

Acker, J. (1990). Hierarchies, jobs, bodies: A theory of gendered organizations. *Gender & Society*, *4*(2), 139-158.

Ackerman, L. K. (2008). Update on immunizations in children and adolescents. *American Family Physician*, *77*(11), 1561-1568.

Allred, N. J., Wooten, K.G., & Kong, Y. (2007). The association of health insurance and continuous primary care in the medical home on vaccination coverage for 19- to 35-month-old children. *Pediatrics*, *119*, S4-S11.

Anand, S., Peter, F., & Sen, A. (2004). *Public health, ethics, and equity*. New York, NY: Oxford University Press.

Atkinson, W. L., Orenstein, W.A., & Krugman, S. (1992). The resurgence of measles in the United States, 1989-1990. *Annual Review of Medicine*, *43*, 451-463.

Baron, C., Loeffler, R., McMakin, W., & Aref, S. (2003). *A study of locality, agency, and individual characteristics affecting food stamp program participation in Virginia*. Retrieved from http://ddr.nal.usda.gov/dspace/bitstream/10113/32799/1/CAT30995028.pdf

Beitsch, L. M., Grigg, M., Menachemi, N., & Brooks, R. G. (2006). Roles of local public health agencies within the state public health system. *Journal of Public Health Management and Practice*, *12*(3), 232-241.

Benedict, R. (1959). *Patterns of culture*. Boston, MA: Houghton Mifflin.

Bennett, N. M., Lewis, B., Doniger, A. S., Bell, K., Kouides, R., LaForce, F. M., & Barker, W. (1994). A coordinated community-wide program in Monroe County, New York, to increase influenza immunization rates in the elderly. *Archives of Internal Medicine*, *14*, 1741-1745.

Bennis, W. (2003). *On becoming a leader*. New York, NY: Basic Books.

Beoku-Betts, J. (1994). When black is not enough: Doing field research among Gullah women. *National Women's Studies Association Journal, 6*, 413-433.

Berkman, L. F., & Kawachi, I. (Eds.) (2000). *Social epidemiology*. New York, NY: Oxford University Press.

Binder, S., Levitt, A. M., Sacks, J. J., & Hughes, J. M. (1999). Emerging infectious diseases: Public health issues for the 21st century. *Science*, *284*, 1311-1313.

Blaikie, N. (2003). *Analyzing quantitative data: From description to explanation*. New York, NY: Sage.

Bloodgood, J. M., & Morrow, J. L. (2003). Strategic organizational change: Exploring the roles of environment structure, internal conscious awareness and knowledge. *Journal of Management Studies*, *40*(7), 1761-1782.

Boggs, W. B. (2004). TQM and organizational culture: A case study. *The Quality Management Journal*, *11*(2), 42-52.

Boin, A., T'hart, P., Stern, E., & Sundelius, B. (2005). *The politics of crisis management: Public leadership under pressure*. New York, NY: Cambridge University Press.

Brenner, B. (2002). Implementing a community intervention program for health promotion. *Social Work in Health Care*, *35*(1-2), 359-375.

Brooks, R. G., Beitsch, L. M., Street, P., & Chukmaitov, A. (2009). Aligning public health financing with essential public health service functions and national performance standards. *Journal of Public Health Management and Practice*, *15*(4), 299-306.

Brownson, R. C., Baker, E. A., Leet, T. L., & Gillespie, K. N. (2003). *Evidence-based public health*. New York, NY: Oxford University Press.

Bryce, J., Arifeen, S., Pariyo, G., et al. (2003). Reducing child mortality: Can public health deliver? *The Lancet, 362*(9378), 159-164.

Burns, J.M. (1978). *Leadership*. New York, NY: Harper Collins.

Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. New York, NY: Oxford University Press.

Cameron, K. S., & Quinn, R. E. (1999). *Diagnosing and changing organizational culture*. Reading, PA: Addison-Wesley.

Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture*. San Francisco, CA: Jossey-Bass.

Capra, F. (1996). *The web of life*. New York, NY: Anchor Books

Carley, K. M. (2002). Smart agents and organizations of the future. In L. Lievrouw & S. Livingstone (Eds.), *The handbook of new media* (pp. 206-210). Thousand Oaks, CA: Sage.

Centers for Disease Control and Prevention (2009). *Statistics and surveillance*. Retrieved from http://www.cdc.gov/vaccines/stats-surv/dPCAult.htm#nis

Centers for Medicare & Medicaid Services (2013). *Federally qualified health centers fact sheet*. Retrieved from www.cms.gov-outreach-ad-education_medicare-learning-network-MLN-MLNproducts_downloads_fqhcfactsheet.pdf

Chu, S. Y., Barker, L. E., & Smith, P. J. (2004). Racial/ethnic disparities in preschool immunizations: United States, 1996-2001. *American Journal of Public Health*, *94*(6), 973-977.

Cohen, J., & Cohen, P. (1975). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah, NJ: Laurence Erlbaum.

Cohen, J. J., Gabriel, B. A., & Terrell, C. (2002). The case for diversity in the health care workforce. *Health Affairs*, *21*(5), 90-102.

Council of State & Territorial Epidemiologists (2009). Assessment of epidemiology capacity in state health departments, United States. *CDC -Morbidity and Mortality Weekly Report*, *58*(49), 1373-1377.

Couto, R. (2002). *To give their gifts: Health, community, and democracy*. Nashville, TN: Vanderbilt University Press.

Crowe, M.K. (2006). *Building community from the outside in: An exploratory study of how public administrators use relationships and funds to build neighborhood capacity to deliver services in four neighborhoods in a California city*. Berkeley: University of California.

Cummings, T. G., & Worley, C. G. (2005). *Organization development and change*. Mason, OH: South-Western.

Cutts, F. T., Orenstein, W. A., & Bernier, R. H. (1992). Causes of low preschool immunization coverage in the United States. *Annual Review of Public Health*, *13*(1), 385-398.

Davis, M. M., Patel, M. S., & Gebremariam, A. (2004). Decline in varicella-related hospitalizations and expenditures for children and adults after introduction of Varicella vaccine in the United States. *Pediatrics*, *114*(3), 786-92.

Deal, T. E., & Kennedy, A. (1983). Culture: A new look through old lenses. *Journal of Applied Behavioral Science*, *19*(4), 498-505.

Deal, T. E., & Kennedy, A. (1999). *The new corporate cultures: Revitalizing the workplace after downsizing, mergers, and reengineering*. Cambridge, MA: Basic Books.

Deal, T. E., Kennedy, A. (1982), *Corporate culture: The rites and rituals of corporate life*. New York, NY: Addison-Wesley.

Delobbe, N., Haccoun, R. R., & Vandenberghe, C. (2006). *Measuring core dimensions of organizational culture: A review of research and development of a new instrument*. Thousand Oaks, CA: Sage.

Dietz, V., Stevenson, E. R., Zell, S., Cochi, S., Hadler, D., & Eddins, D. (1994). Potential impact on vaccination coverage levels by administering vaccines simultaneously and reducing dropout rates. *Archives of Pediatric and Adolescent Medicine, 148*(9), 943-949.

Dombkowski, K. J. (2001). *Estimating risk factors for delays in childhood immunization using the National Health Interview survey*. Unpublished doctoral dissertation, University of Michigan, Ann Arbor, MI.

Dominguez, S. R. (2004). On-time immunization rates among children who enter Chicago public schools. *Pediatrics*, *114*(6), e741-747.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of inter-organizational competitive advantage. *Academy of Management Review*, *23*(4), 660-679.

Ehresmann, K. R., White, K. E., & Hedberg, C. W. (1998). A statewide survey of immunization rates in Minnesota school age children: implications for targeted assessment and prevention strategies. *Pediatric Infectious Disease Journal*, *17*(8), 711-716.

Eisenman, D. P., Wold, C., Setodji, C., Hickey, S., Lee, B., Stein, B. D., & Long, A. (2004). Will public health's response to terrorism be fair? Racial/ethnic variations in perceived fairness during a bioterrorist event. *Biodefense Strategy, Practice, and Science*, *2*(3), 146-156.

Emmons, K. M., Thompson, B., McLerran, D., Sorensen, G., Linnan, L., Basen-Engquist, K., & Biener, L. (2000). The relationship between organizational characteristics and the adoption of workplace smoking policies. *Health Education and Behavior*, *27*(4), 483-501.

Eng, E., & Parker, E. (1994). Measuring community competence in the Mississippi Delta: The interface between program evaluation and empowerment. *Health Education and Behavior*, *21*(2), 199-220.

Eng, E., & Young, R. (1992). Lay health advisors as community change agents. *Family & Community Health*, *15*(1), 24-40.

Ennis, K., & Harrington, D. (1999). Quality management in Irish health care. *International Journal of Health Care and Quality Assurance*, *12*(6), 232-44.

Essed, P., & Goldberg, D. T. (2002). Cloning cultures: The social injustices of sameness. *Ethnic and Racial Studies*, *25*(6), 1066-1082.

Evans, J. R., & Mathur, A. (2005). The value of online surveys. *Internet Research*, *15*(2), 195-219.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*(3), 272-99.

Fairbrother, P. (2000). Global unions: Past efforts and future prospects. *Indus Relations*, *60*(3), 405-431.

Fassoula, E. D. (2004). Managing the project of organizational structure change by using a flexible tool. *Operations Research*, *4*(3), 389-398.

Fawcett, S. B., Paine-Andrews, A., Francisco, V. T., Schultz, J. A., Richter, K. P., Lewis, R. K., Williams, E. L., Harris, K. J., Berkley, J. Y., Fisher, J. L., & Lopez, C. M. (1995). Using empowerment theory in collaborative partnerships for community health and development. *American Journal of Community Psychology, 23*(5), 677-697.

Fidler, D. P. (2004). Germs, governance, and global public health in the wake of SARS. *Journal of Clinical Investigation*, *113*(6), 799-804.

Fielding, J. E., & Frieden, T. R. (2004). Local knowledge to enable local action. *American Journal of Preventive Medicine*, *27*(2), 183-184.

Flin, R. (2007). Measuring safety culture in healthcare: A case for accurate diagnosis. *Safety Science*, *45*, 653-657.

Florin, P. (1993). Identifying training and technical assistance needs in community coalitions: A developmental approach. *Health Education Research*, *8*(3), 417-432.

Forbes-Thompson, S., Gajewski, B., Scott-Cawiezell, J., & Dunton, N. (2006). An exploration of nursing home organizational processes. *Western Journal of Nursing Research*, *28*(8), 935-954.

Foucault, M. (1997). *Society must be defended*. New York, NY: Picador.

Freed, G. L., Clark, S. J., & Cowan, A. E. (2000). State-level perspectives on immunization policies, practices, and program financing in the 1990s. *American Journal of Pediatric Medicine*, 32-44.

Garmestani, A. S., Allen, C. R., & Gunderson, L. (2009). Panarchy: Discontinuities reveal similarities in the dynamic system. Retrieved from http://www.ecologyandsociety.org/vol14/iss1/art15/

George, D., & Mallery, P. (2002). *SPSS for windows step by step: A simple guide and reference 11.0 update* (4th ed.). Boston, MA: Allyn and Bacon.

Gifford, B. D., Zammuto, R. F., & Goodman, E. A. (2002). The relationship between hospital unit culture and nurses' quality of work life. *Journal of Healthcare Management*, *47*(1), 13.

Greenleaf, R. K. (1977). *Servant leadership: A journey into the nature of legitimate power and greatness*. New York, NY: Paulist Press.

Griffith, D. M., Childs, E. L., & Jeffries, V. (2007). Racism in organizations: The case of a county public health department. *Journal of Community Psychology*, *35*(3), 287–302. doi:10.1002/jcop.20149

Groom, H., Kennedy, A., Evans, V., & Fasano, N. (2010). Qualitative analysis of immunization programs with most improved childhood vaccination coverage from 2001 to 2004. *Journal of Public Health Management and Practice*, *16*(1), E1-E8.

Gust, D. A., Darling, N., Kennedy, A., & Schwartz, B. (2008). Parents with doubts about vaccines: Which vaccines and reasons why. *Pediatrics*, *122*(4), 718-25.

Gust, D. A., Strine, T. W., Maurice, E., Smith, P., Yusuf, H., Wilkinson, M., Battaglia, M., Wright, R., & Schwartz, B. (2004). Under-immunization among children: Effects of vaccine safety concerns on immunization status. *Pediatrics*, *14*(1), e16-22.

Haley, D. R. (1999). *Local public health department childhood immunization programs: An inquiry into immunization delivery process, management culture, and organizational linkages*. Unpublished doctoral dissertation, University of North Carolina, Chapel Hill.

Handler, S. (2001). Real preventive medicine. *Minnesota Medicine*, *84*(12), 7.

Hannabus, S. (2000). Being there: Ethnographic research and autobiography. *Library Management*, *21*(2), 99-106.

Harrison, J. R., & Carroll, G. R. (2006). *Culture and demographics in organizations*. Princeton, NJ: Princeton University Press.

Hatch, M.J., & Cunliffe, A.L. (2006). *Organizational theory: Modern, symbolic, and postmodern perspectives*. New York, NY: Oxford University Press.

Hawkins, B. S. R. (1990). *The management of staff development in a contracting education service*. Unpublished doctoral dissertation, Birmingham Polytechnic, Birmingham, England.

Heifetz, R. A. (1994). *Leadership without easy answers*. Cambridge, MA: Harvard College.

Heifetz, R. A., & Laurie, D. L. (2001, December). *The work of leadership*. *Harvard Business Review*. Retrieved from http://hbr.org/2001/12/the-work-of-leadership/ar/1

Helfrich, C. D., Li, Y. F., Mohr, D. C., Meterko, M., & Sales, A. E. (2007). Assessing an organizational culture instrument based on the competing values framework: Exploratory and confirmatory factor analysis. *Implementation Science*, *2*(13). Retrieved from http://link.springer.com/article/10.1186%2F1748-5908-2-13#page-1

Hesse, H. (1956). *Journey to the east*. New York, NY: St. Martin's Press.

Hill, C. E., Knox, S., Thompson, B. J., et al. (2005). Consensual qualitative research: An update. *Journal of Counseling Psychology*, *52*(2), 196-205.

Hillman, A. L., Ripley, K., Goldfarb, N., Weiner, J., Nuamah, I., & Lusk, E. (1999). The use of physician financial incentives and feedback to improve pediatric preventive care in Medicaid managed care. *Pediatrics*, *104*(4), 931-35.

Hodge, J. G., Garcia, A. M., Anderson, E. D., & Kaufman, T. (2009, Supplement). Emergency legal preparedness for hospitals and health care personnel. *Disaster Medicine and Public Health Preparedness, 3*(2), 37-44.

Hofrichter, R. (2004). *Health and social justice: Politics, ideology, and inequity in the distribution of disease*. San Francisco, CA: Jossey-Bass.

Hofstede, G. (1990). *Cultures and organizations: Software of the mind*. New York, NY: McGraw Hill.

Hogan, R. & Kaiser, R. B. (2005). What we know about leadership. *Review of General Psychology*, *9*(2), 169-180.

Hooker, C., & Ali, S. H. (2008). *SARS and security: Public health in the 'new normal*.' Retrieved from http://www.allacademic.com/meta/p103834_index.html

Humiston, S. G., & Good, C. (2000). *Vaccinating your child: Questions and answers for the concerned parent*. Atlanta, GA: Peachtree.

Hunt, N. (2004). Public health or human rights: What comes first? *International Journal of Drug Policy*, *15*(4), 231-237.

Institute of Medicine (2003). *Financing Vaccines in the 21st century: Assuring access and availability*. Washington, DC: The Academies Press.

Iton, A. (2009, February). *Transforming public health practice to achieve health equity*. Retrieved from http://www.thrivingstudents.org/sites/default/files/Health%20Equity%20Summit%20-%20Dr.%20Anthony%20Iton.pdf

Ivester, S. K. (2006). *A tale of two communities: The relationship between community development, community health, and social capital*. Chicago, IL: University of Chicago, Department of Sociology.

Kaufman, H.F. (1959). Toward an interactional conception of community. *Social Forces*, *38*, 8-17.

Kellerman, B. (2008). *Followership: How followers are creating change and changing leaders*. Cambridge, MA: Harvard Business Press.

Kim, J. O., & Mueller, C. W. (1978). *Introduction to factor analysis: What it is and how to do it*. Newbury Park, CA: Sage.

Kirschke, D. L., Craig, A. S., Schaffner, W., Daugherty, J. R., Narramore, J., & Griffin, M. R. (2004). Childhood immunization rates before and after the implementation of Medicaid managed care. *Archives of Pediatric and Adolescent Medicine*, *158*(3), 230-235.

Koenig, M. A., Bishai, D., & Khan, M. A. (2001). Health interventions and health equity: The examples of measles vaccination in Bangladesh. *Population Development Review*, *27*(2), 283-302.

Koh, H., & Jacobson, M. (2009). Fostering public health leadership. *Journal of Public Health*, *31*(2), 199-201.

Kotter, J. P., & Cohen, D. S. (2002). *The heart of change: Real-life stories of how people change their organizations*. Cambridge, MA: Harvard Business Press.

Krieger, N. (2000). Epidemiology and social sciences: Towards a critical reengagement in the 21st century. *Epidemiologic Reviews*, *22*(1), 155-163.

Kusy, M., & Marr, T. (1991). Learning and performance changes of physician executives: Evaluation of a management training and development program. *Journal for Research on Learning in the Workplace*, *1*(1), 37-44.

Leana, C. R., & Van, B. (1999). Organizational social capital and employment practices. *Academy of Management*, *24*(3), 538-555.

Lee, G. M., Santoli, J. M., Hannan, C., Messonier, M. L., Sabin, J. E., Rusinak, D., Gay, C., Lett, S. M., & Lieu, T. A. (2007). Gaps in vaccine financing for underinsured children in the United States. *Journal of the American Medical Association*, *298*(6), 638-643.

Leischow, S. J., & Milstein, B. (2006). Systems thinking and modeling for public health practice. *American Journal of Public Health*, *96*(3), 403-405.

Levy, B. S., & Sidel, V. W. (2006). *Social injustice and public health*. New York, NY: Oxford University Press.

Li, R., Darling, N., Maurice, E., Barker, L., & Grummer-Strawn, L. M. (2005). Breastfeeding rates in the United States by characteristics of the child, mother, or family. The 2002 national immunization survey. *Pediatrics*, *115*(1), e31-e37.

Lincoln, J. R., & Guillot, D. (2004). *Durkheim and organizational culture*. Retrieved from http://www.escholarship.org/uc/item/00v999cr

Lincoln, J. R., & Kalleberg, A. L. (1990). *Culture, control, and commitment: A study of work organization and work attitudes in the United States and Japan*. New York, NY: Cambridge University Press.

Lomas, J. (1998). Social capital and health: Implications for public health and epidemiology. *Social Sciences and Medicine*, *47*(9), 1181-1188.

Luman, E. T. (2004). *Timeliness of early childhood vaccinations in the United States*. Unpublished doctoral dissertation, Emory University, Atlanta, Georgia.

Luman, E. T., Barker, L. E., McCauley, M. M., & Drews-Botsch, C. (2005). Timeliness of childhood immunizations: A state-specific analysis. *American Journal of Public Health*, *95*(8), 1367-1374.

Lupton, D. (1995). Medical and health stories on the Sydney Morning Herald's front page. *Australian Journal of Public Health*, *19*(5), 501-508.

Maciosek M.V., Edwards, N. M., Coffield, A. B., et al. (2006). Priorities among effective clinical preventive services: Methods. *American Journal of Preventive Medicine*, *31*, 90-96.

Madamala, K. (2004). *A study of rowing and steering by local health agencies*. Chicago, IL: University of Illinois.

Mallinger, M. (1998). Maintaining control in the classroom by giving up control. *Journal of Management Education*, *22*(4), 472-483.

Margolis, P. A., Stevens, R., Bordley, W. C., Stuart, J., Harlan, C., Keyes-Elstein, L., & Wisseh, S. (2001). From concept to application: The impact of a community-wide intervention to improve the delivery of preventive services to children. *Pediatrics*, *108*(3), e42.

Mayrowetz, D., Murphy, J., Louis, K. S., & Smylie, M. (2007). Distributed leadership as work redesign: Retrofitting the job characteristics model. *Leadership and Policy in Schools*, *6*(1), 69-101.

McCauley, M. M., Luman, E. T., Barker, L. E., Rodewald, L. E., Simpson, D. M., & Szilagyi, P. G. (2001, Supplement). The national immunization survey: Information for action. *American Journal of Preventive Medicine*, *20*(4), 1-2.

McLean, S. (1996). Continuing education and the postmodern arts of power. *Canadian Journal of University Continuing Education*, *22*(2), 7-26.

McLean, S. (2008). Progress, public health, and power: Foucault and the homemakers clubs of Saskatchewan. *Canadian Review of Sociology*, *45*(3), 225-245.

Mendelsohn, R. (1987). *How to raise a health child in spite of your doctor*. New York, NY: Ballantine Books.

Miller, D. C. (1958). Industry and community power structure: A comparative study of an American and an English city. *American Sociological Association Review*, *23*(1), 9-15.

Mitchell, S. M., & Shortell, S. M. (2000). The governance and management of effective community health partnerships: A typology for research, policy, and practice. *Milbank Quarterly*, *78*(2), 241-289.

Morens, D. M., Folkers, G. K., & Fauci, A. S. (2004). The challenge of emerging and re-emerging infectious diseases. *Nature*, *430*, 242-49.

Morgan, G. (1997). Imaginization: New mindsets of seeing, organizing and managing. Thousand Oaks, CA: Sage.

National Association of Community Health Centers (2010). *Partnerships between federally qualified health centers & local health departments for engaging in the development of a community-based system of care*. Retrieved from partnerships-between-fqhcs-and-lhds_final_11_03_10.pdf

Newacheck, P. W., Stoddard, J., Hughes, D. C., & Pearl, M. (1998). Health insurance and access to primary care for children. *New England Journal of Medicine*, *338*(8), 513-519.

Nordstrom, K., & Ridderstrale, J. (1999). *Funky business: Talent makes capital dance*. Upper Saddle River, NJ: Prentice Hall

Nunnaly, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Olshen, E., Mahon, B., Wang, S., & Woods, E. (2007). The impact of state policies on vaccine coverage by age 13 in an insured population. *Journal of Adolescent Health*, *40*(5), 405-411.

Omer, S. B., Salmon, D. A., Orenstein, W. A., et al (2009). Vaccine refusal, mandatory immunization, and the risks of vaccine-preventable diseases. *New England Journal of Medicine*, *360*, 1981-1988.

Ostroff, S. M. (2011). Measles: Going, going, but not gone. *Journal of Infectious Disease*, *208*(11): 150-09.

Palfrey, J. (2006). *Child health in America: Making a difference through advocacy*. Baltimore, MD: Johns Hopkins University Press.

Peterson, M. W. (1997). *Planning and management for a changing environment: A handbook on redesigning postsecondary institutions*. San Francisco, CA: Jossey-Bass.

Pettigrew, A. M. (1979). On studying organizational cultures. *Administrative Science Quarterly*, *24*(4), 570-581.

Pogge, T. W. (2005). Human rights and global health: A research program. *Metaphilosophy*, *36*(1/2), 182-209.

Potter, M. A., Ley, C. E., Fertman, C. I., Eggleston, M. M., & Duman, S. (2003). Evaluating workforce development: Perspectives, processes, and lessons learned. *Journal of Public Health Management and Practice, 9(*6), 489-9.

Prentice, R. (2008). Bay area health inequities. *Race, Poverty, & the Environmnent*, *15*(1). Retrieved from http://urbanhabitat.org/node/2816

Prentice, R. (2007). Epidemiologic methods developments: A look forward to the year 2032. *Annals of Epidemiology*, *17*(11), 906-910.

Quinn, R. E., & Rohrbaugh, J. (1981). A competing values approach to organizational effectiveness. *Public Productivity Review*, *5*(2), 122-140.

Quinn, R. E., & Spreitzer, G. M. (1991). The psychometrics of the competing values culture instrument and an analysis of the impact of organizational culture on quality of life. *Research in Organizational Change and Development*, *5*, 115-142.

Ransom, J. A. (2008). *Individual learning activity assignment*. Unpublished manuscript, Ph.D Program in Leadership & Change, Antioch University, Yellow Springs, OH.

Ransom, J. A., Brown, D., & Randall, T. (2003). *Costs of smallpox vaccination program: Summary of preliminary data*. Retrieved from http://www.naccho.org/topics/HPDP/infectious/immunization/resources/upload/Research_Brief_10.pdf

Raviglione, M. C. (2008). Facing extensively drug-resistant tuberculosis – a hope and a challenge. *New England Journal of Medicine*, *359*(6), 636-638.

Reay, D. (1995, March-April). Feminist research: The fallacy of easy access. *Women's Studies International Forum, 18*, 205-213.

Riessman, C. K. (1987, June). When gender is not enough: Women interviewing women. *Gender and Society, 1*, 172-207

Rietveld, T., & Van Hout, R. (1993). *Statistical techniques for the study of language and language behavior.* Berlin, Germany: Mouton de Gruyter.

Robbins, S. P., & DeCenzo, D. A. (2008). *Fundamentals of management: Essential concepts and applications*. Upper Saddle River, NJ: Prentice Hall.

Rosen, G. (1958). *A history of public health*. New York, NY: MD.

Rosenthal, J., Rodewald, L., McCauley, M., Berman, S., Irigoyen, M., Sawyer, M., Yusuf, H., Davis, R., & Kalton, G. (2004). Immunization coverage levels among 19 to 35 month-old children in 4 diverse, medically underserved areas of the United States. *Pediatrics*, *113*(4), e296-e302.

Rost, J. C. (1991). *Leadership for the 21st century*. Westport, CT: Praeger.

Roussos, S. T., & Fawcett, S. B. (2000). A review of collaborative partnerships as a strategy for improving community health. *Annual Review of Public Health*, *21*, 369-402.

Rowitz, L. (2003). *Public health leadership: Putting principles into practice*. Sudbury, MA: Jones and Bartlett.

Rudner, N. (1996). Potentials for improving health department immunization rates: The relationships between service delivery factors and immunization completion. *Journal of Public Health Management and Practice*, *2*(1), 50-58.

Rudner Lugo, N. (1993). *The relationship among service delivery factors, community characteristics, and immunization completion by two-year old children using county health departments*. Unpublished doctoral dissertation, University of Michigan, Ann Arbor, MI.

Rycroft, R. W., & Kash, D. E. (2004). Self-organizing innovative networks: Implications for globalization. *Technovation*, *24*(3), 187-197.

Ryman, T. K., Dietz, V., & Cairns, K. L. (2008). Too little but not too late: Results of a literature review to improve routine immunization in developing countries. *BMC Health Services Research*, *8*, 134.

Santoli, J. M., Rodewald, L. E., Maes, E. F., Battaglia, M. P., & Coronado, V. G. (1999). Vaccines for children program, United States, 1997. *Pediatrics*, *104*(2), e15.

Sawyer, S., & Rosenbaum, H. (2000). Social informatics in the information sciences: Current activities and emerging directions. *Information Science Research*, *3*(2), 89.

Schein, E. (1985), Coming to a new awareness of organizational culture. *Sloan Management Review*, *25*(2), 3-16.

Schein, E. (2004). *Organizational culture and leadership*. San Francisco, CA: Jossey-Bass.

Schnedier, M., & Somers, M. (2006). Organizations as complex adaptive systems: Implications of complexity theory for leadership research. *Leadership Quarterly*, *17*(4), 351-365.

Schneider, B., Brief, A. P., Guzzo, R. A., & Organ, D. (1996). *Creating a climate and culture for sustainable organizational change*. New York, NY: Elsevier.

Schwab, D. P. (2005). *Research methods for organizational studies*. Mahway, NJ: Lawrence Erlbaum.

Schwarz, G. M. (2002). Organizational hierarchy adaptation and information technology. *Information and Organization*, *12*(3), 153-182.

Scott, T., Mannion, R., Davies, H., & Marshall, M. (2003). The quantitative measurement of organizational culture in health care: A review of the available instruments. *Health Services Research*, *38*(3), 923-945.

Scott-Cawiezell, J., Jones, K., Moore, L., & Vojir, C. (2005). Nursing home culture: A critical component in sustained improvement. *Journal of Nursing Care Quality*, *20*(4), 341-348.

Scott-Cawiezell, J., Schenkman, M., Moore, L., Vojir, C., Connolly, R. P., Pratt, M., & Palmer, L. (2004). Exploring nursing home staff's perceptions of communication and leadership to facilitate quality improvement. *Journal of Nursing Care Quality*, *19*(3), 242-252.

Sears, R. (2007). *The vaccine book: Making the right decision for your child*. New York, NY: Little, Brown.

Seid, M., Lotstein, D., Williams, V. L., Nelson, C., Leuschner, K. J., Diamant, A., Stern, S., Wasserman, J., & Lurie, N. (2007). Quality improvement in public health emergency preparedness. *Annual Review of Public Health*, *28*, 19-31.

Senge, P. M. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. New York, NY: Doubleday.

Senge, P. M., Scharmer, C. O., Jaworski, J., & Flowers, B. S. (2005). *Presence: An exploration of profound change in people, organizations, and society*. New York, NY: Doubleday.

Shefer, A., Briss, P., Rodewald, L., Bernier, R., Strikas, R., Hussain, Y., Ndiaye, S., Pappaioanou, M., & Hinman, A. R. (1999). Improving immunization coverage rates: An evidence-based review of the literature. *Epidemiologic Reviews*, *21*(1), 96-142.

Shefer, A., Santoli, J., Wortley, P., et al. (2006). Status of quality improvement activities to improve immunization practices and delivery: Findings from the immunization quality improvement symposium, October 2003. *Journal of Public Health Management and Practice*, *12*(1), 77-89.

Shortell, S. M. (1988). The evolution of hospital systems: Unfulfilled promises and self-fulfilling prophecies. *Med Care Research and Review*, *35*(2), 177-214.

Shortell, S. M., Rousseau, D. M., Gillies, R. R., Devers, K. J., & Simons, T. L. (1991). Organizational assessment in intensive care units (ICUs): Construct development, reliability, and validity of the ICU nurse-physician questionnaire. *Medical Care Research and Review*, *29*(8), 709-726.

Siehl, C., & Martin, J. (1984). The role of symbolic management: How can managers effectively transmit organizational culture? In J. G. Hunt, D. M. Hoskig, C. A. Schriesheim, & R. Stewart (Eds.), *Leaders and managers: International perspectives on managerial behavior and leadership* (pp. 227-269). New York, NY: Pergamon Press.

Sinn, J. S., Morrow, A. L., & Finch, A. B. (1999). Improving immunization rates in private pediatric practices through physician leadership. *Archives of Pediatric and Adolescent Medicine*, *153*(6), 597-603.

Slade, G. D., Spencer, A. J., Locker, D., Hunt, R. J., Strauss, R. P., & Beck, J. D. (1996). Variations in the social impact of oral conditions among older adults in South Australia, Ontario, and North Carolina. *Journal of Dental Research*, *75*(7), 1439-1450.

Smith, P. J., Battaglia, M. P., Huggins, V. J., Hoaglin, D. C., Roden, A., Khare, M., Ezzati-Rice, T. M., & Wright, R. A. (2001, Supplement). Overview of the sampling design and statistical methods used in the national immunization survey. *American Journal of Preventive Medicine*, *20*(4), 17-24.

Smith, P. J., Jain, N., Stevenson, J., Mannikko, N., & Molinari, N. A. (2009). Progress in timely vaccination coverage among children living in low-income households. *Archives of Pediatric and Adolescent Medicine*, *163*(5), 462-468.

Snook, S. C., & Gorsuch, R. L. (1989). Component analysis versus common factor analysis: A Monte Carlo study. *Psychology Bulletin*, *106*(1), 148-54.

Stanley, D. J., Meyer, J. P., & Topolnytsky, L. (2005). Employee cynicism and resistance to organizational change. *Journal of Business Psychology*, *19*(4), 429-459.

Starbuck, G. (1965). Organizational growth and development. In J. G. March (Ed), *Handbook of organizational design* (pp. 451-583). Chicago, IL: University of Chicago Press.

Suchman, A. L. (2001). The influence of health care organizations on well-being. *Western Journal of Medicine*, *174*, 43-47.

Szilagyi, P. G., Schaffer, S., Shone, L., Barth, R., Humiston, S. G., Sandler, M., & Rodewald, L. E. (2002). Reducing geographic, racial, and ethnic disparities in childhood immunization rates by using reminder/recall interventions in urban primary care practices. *Pediatrics*, *110*(5), e58.

Tabachnick, B. G., & Fidell, L. S. (2000). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn and Bacon.

Taras, V. (2008). *Catalogue of instruments for measuring cultur*e. Retrieved from http://ucalgary.ca/~taras/_private/Culture_Survey_Catalogue.pdf

Thompson, R. S. (2007). *Homeschooling today*. Retrieved from www.homeschooltoday.com/news/40/30/Beyond-Writing/

Todd, L. J. (2007). *The impact of state child care regulations on school readiness*. Starkville, MS: Mississippi State University.

Turner, V. W. (1975). *Dramas, fields, and metaphors: Symbolic action in human society*. London, England: Cornell University Press.

Vaill, P. B. (1990). *Management as a performance art*. San Francisco, CA: Jossey-Bass.

Vaill, P. B. (1996). *Learning as a way of being: Strategies for survival in a world of permanent white*. San Francisco, CA: Jossey-Bass.

Victora, C., Wagstaff, A., Schellenberg, J., Gwatkin, D., Claeson, M., & Habicht, J. (2003). Applying an equity lens to child health and mortality: More of the same is not enough. *The Lancet*, *362*(9379), 233-241.

Vogelsmeier, A. A. (2008). *Leadership, communication, and teamwork: Differences between high and low-performing nursing homes*. Columbia, MO: University of Missouri.

Weber, M. (1947). *The theory of social and economic organization*. New York, NY: The Free Press.

Weick, K. E. (1979). *The social psychology of organizing*. Reading, MA: Addison-Wesley.

Wheatley, M. J., & Keller-Rogers, M. (1996, July/August). Self-organizing: The irresistible future of organizing. *Strategy and Leadership*, *24*, 18-24.

Whitehead, M. (1991). The concepts and principles of equity and health. *Health Promotion International*, *6*(3), 217-28.

Williams, D. R. (1990). Socioeconomic differentials in health: A review and redirections. *Social Psychology Quarterly*, *53*(2), 81-99.

Williams, D. R. (1995). US socioeconomic and racial differences in health: Patterns and explanations. *Annual Review of Sociology*, *21*, 349.

Williams, D. R. (1998). African-American health: the role of the social environment. *Journal of Urban Health*, *75*, 300-321.

Williams, R. (2008). *Analytic strategies: Simultaneous, hierarchical, and stepwise regression*. Retrieved from http://www.nd.edu/~rwilliam/stats1/x95.pdf

Wilson, K. (1998). Telephone or face-to-face interviews?: A decision made on the basis of a pilot study. *International Journal of Nursing Studies*, *35*(6), 314-321.

Wilson, T. R., Fishbein, D. B., Ellis, P. A., & Edlavitch, S. A. (2005). The impact of a school entry law on adolescent immunization rates. *Journal of Adolescent Health*, *37*(6), 511-516.

Wooten, L. P., & Crane, P. (2003). Nurses as implementers of organizational culture. *Nursing Economics*, *21*(6), 275-279.