

Medical University of South Carolina

MEDICA

MUSC Theses and Dissertations

2018

Potential for Revenue Capture for Local Public Health: An Examination of Private Insurance Claims Data 2010-2014

Margaret Ostafin

Medical University of South Carolina

Follow this and additional works at: <https://medica-musc.researchcommons.org/theses>

Recommended Citation

Ostafin, Margaret, "Potential for Revenue Capture for Local Public Health: An Examination of Private Insurance Claims Data 2010-2014" (2018). *MUSC Theses and Dissertations*. 290.

<https://medica-musc.researchcommons.org/theses/290>

This Dissertation is brought to you for free and open access by MEDICA. It has been accepted for inclusion in MUSC Theses and Dissertations by an authorized administrator of MEDICA. For more information, please contact medica@musc.edu.

POTENTIAL FOR REVENUE CAPTURE FOR LOCAL PUBLIC HEALTH:
AN EXAMINATION OF PRIVATE INSURANCE CLAIMS DATA 2010-2014

By

Margaret Ostafin

A doctoral project submitted to the faculty of the Medical University of South Carolina
in partial fulfillment of the requirements for the degree Doctor of Health Administration
in the College of Health Professions

© Margaret Ostafin 2018 All rights reserved

POTENTIAL FOR REVENUE CAPTURE FOR LOCAL PUBLIC HEALTH:
AN EXAMINATION OF PRIVATE INSURANCE CLAIMS DATA 2010-2014

By

Margaret Ostafin

Approved by:

 4/23/18

Chair, Project Committee Kit Simpson, DrPH Date

 4/24/18

Member, Project Committee Michael Meacham, JD, MPH Date

 Digitally signed by Jeanne A. Matthews
DN: cn=Jeanne A. Matthews, o=Marymount University, ou=Malek School of Health
Professions, email=jamatthe@marymount.edu, c=US
Date: 2018.04.23 04:44:14 -05'00'

Member, Project Committee Jeanne Matthews, PhD Date

 4/28/18

Interim Dean, James S Zoller, PhD Date
College of Health Professions

ACKNOWLEDGEMENTS

The last few years have been an interesting journey for me and my family. I am thankful for my two great kids, Eleanor and Kasper, who supported their Mom in countless ways, known and unknown to them: helping with household tasks, graciously tolerating ‘breakfast for dinner’ on many evenings, understanding that schoolwork stole fun nights and weekends, and providing much needed hugs and kisses. I am blessed with a loving support system: my awesome parents, Frank and Jadwiga; my cheerleader siblings, Violetta and Arthur; and numerous extended family and friends who checked in to offer words of encouragement to move me forward on my path.

Thank you to my committee chair, Dr. Kit Simpson, for encouraging me to pursue this topic when I first mentioned it in class. Her ongoing support, thoughtful insights, and gentle nudges to ‘wrap up’ and graduate were exactly what I needed to keep at this. Thank you also to my committee members, Michael Meacham and Dr. Jeanne Matthews for reading through drafts, providing useful feedback, and placing this topic into ‘bigger picture’ perspective.

Finally, a special thank you to my work colleagues -- my boss, Dr. Reuben Varghese, for supporting my doctoral pursuits and providing work flexibility, words of wisdom, and caring words along the way; and Errol Chin-Loy for always brightening up my day with humor, engaging in discussions about our own local billing practices, and most importantly being a dear friend and mentor.

Abstract of Doctoral Project Presented to the
Executive Doctoral Program in Health Administration & Leadership
Medical University of South Carolina
In Partial Fulfillment of the Requirements for the
Degree of Doctor of Health Administration

**POTENTIAL FOR REVENUE CAPTURE FOR LOCAL PUBLIC HEALTH: AN
EXAMINATION OF PRIVATE INSURANCE CLAIMS DATA 2010-2014**

By

Margaret Ostafin

Chairperson: Kit Simpson, DrPH, Medical University of South Carolina
Committee: Michael Meacham, JD, MPH, Medical University of South Carolina
Jeanne Matthews, PhD, Marymount University

In response to changes in the local public health system driven by budget cuts, funding requirements, and increased costs of providing clinical and preventive services, local health departments (LHDs) are increasingly billing third party payers to generate revenue. Survey and interview data from the National Association of County and City Health Officials (NACCHO) indicate that 90% of LHDs bill third-party payers. Although systems are set up to bill public insurance such as Medicaid and Medicare, there is a paucity of information on billing commercial insurance. This study contributes to understanding the current billing landscape for local public health. A retrospective examination of private insurance data for a five-year period indicates a 123% increase in reimbursement to health departments and an 11% increase in out of pocket costs to clients. Regional variations show that clients in the Northeast paid more out of pocket compared to other U.S. regions. Additionally, reimbursements to health departments were higher in Medicaid expansion vs. non-expansion states.

Keywords: billing, local health department, public health, public health services, preventive services, private insurance, reimbursement

TABLE OF CONTENTS

| | |
|--|-----|
| Acknowledgement..... | iii |
| Abstract..... | iv |
| Table of Contents..... | v |
| List of Figures..... | vi |
| List of Tables..... | vii |
| | |
| I. INTRODUCTION | |
| Background..... | 1 |
| Problem statement..... | 1 |
| Study objectives..... | 2 |
| Research questions..... | 3 |
| Population..... | 3 |
| | |
| II. REVIEW OF THE LITERATURE | |
| Approach to literature review..... | 5 |
| Description of local health departments..... | 6 |
| Provision of services and funding..... | 7 |
| Economic recession..... | 9 |
| Impetus for billing..... | 11 |
| Billing for immunization services..... | 12 |
| Billables Project..... | 14 |
| Billing for STI/STD services..... | 15 |
| Billing for other services..... | 19 |
| Identified barriers to billing..... | 20 |
| | |
| III. METHODOLOGY | |
| Study design..... | 22 |
| Description of methodology and analysis..... | 23 |
| Study objectives..... | 24 |
| | |
| IV. RESULTS | 26 |
| | |
| V. DISCUSSION | |
| Summary of findings..... | 36 |
| Policy and research implications..... | 38 |
| Limitations..... | 40 |
| Conclusion..... | 41 |
| | |
| VI. REFERENCES | 43 |
| | |
| VII. APPENDIX | 50 |

LIST OF FIGURES

| | | <u>Page</u> |
|-----------|--|-------------|
| Figure 1 | Total Pay and Out of Pocket by Year | 27 |
| Figure 2 | Percentage of Out of Pocket by Region | 29 |
| Figure 3 | Total Pay by Type of Service over Time | 30 |
| Figure 4 | Percent Out of Pocket by Type of Service and Year | 30 |
| Figure 5 | Total Pay and Census Population in 2014 | 31 |
| Figure 6 | Total Pay by Per Capita Income in States in 2014 | 32 |
| Figure 7 | Total Out of Pocket by Per Capita Income in States in 2014 | 32 |
| Figure 8 | Distribution of Services of Total Pay in 2014 | 33 |
| Figure 9 | Distribution of Services Out of Pocket in 2014 | 33 |
| Figure 10 | Percent of Total Out of Pocket Costs by Service in 2014 | 34 |
| Figure 11 | Total Pay and Total Out of Pocket in Medicaid Expansion vs. Non-Expansion States in 2014 | 35 |

LIST OF TABLES

| | | <u>Page</u> |
|---------|--|-------------|
| Table 1 | Total Pay, Total Achieved, Total Out of Pocket 2010-2014 | 26 |
| Table 2 | Percentage of Out of Pocket Cost by Region | 29 |

CHAPTER I

INTRODUCTION

Background

Local health departments (LHDs) are increasingly interested in billing third-party payers for clinical and preventive services. Survey and interview data from the National Association of County and City Health Officials (NACCHO) indicate a change in the number of health departments that are billing for services. According to the 2015 NACCHO Forces of Change Survey, 90% of LHDs billed third-party payers, which included Medicaid, Medicare, and private insurance; this was an increase from 86% in 2014 (NACCHO, 2015, NACCHO, 2014, Newman & Leep, 2014). In 2014, most LHDs billed third-party payers for at least one clinical service: 21% billed only public insurance; 4% billed only private insurance. The services that were most frequently billed were: immunization, family planning, and home health services (Newman & Leep, 2014).

Although systems are in place to bill public insurance such as Medicaid and Medicare, there is a paucity of information on billing commercial (i.e., private) health insurance. This creates a barrier to tapping into this important source of potential funding for local public health. Funding for local health departments comes from a mix of federal, state, and local revenue sources, however, budget cuts from all three sources impair the delivery of essential services to the community (NACCHO, 2015). Billing for public health services is a complex issue that is tied to local public health infrastructure, governance, and funding streams.

Problem statement

The local public health billing landscape is currently an incomplete picture that needs additional information. Although NACCHO data indicate that LHDs are serving a higher

percentage of patients with health insurance, a quarter of those surveyed did not know if their health department served clients with health insurance because they did not ask clients about insurance status or the information is not readily available (NACCHO, 2014). Additionally, several factors have not been explored with regard to commercial health insurance, such as the types of local health department services worth the effort of billing and the amount of reimbursement collected for different types of services. On an individual level, it is not known how large of a proportion of a bill for LHD services becomes a payment burden to the client because of commercial insurance deductibles and co-payment rules.

Study objective

The purpose of this study is to analyze claims data from a commercial billing database to better understand the billing landscape at the local public health level, particularly around billing private insurance for clinical and preventive services. The proposed study objectives are to: 1) describe the types of LHD services that are billed to private health insurance in different states, 2) determine average annual billing amounts per service, 3) describe geographic differences in types of billed services, and 4) describe differences in billing services over time (available data years 2010-2014), particularly with the implementation of the Patient Protection and Affordable Care Act of 2010 (ACA).

Current literature on billing and LHDs draws primarily from two sources: NACCHO surveys and interviews conducted with LHD samples, and case studies and anecdotal evidence that reflect LHD billing practices and experiences. The NACCHO Profile surveys demonstrate that revenue is being generated from billing Medicare, Medicaid, and private insurance. Etkind and colleagues (2014) point out that the NACCHO surveys report a continued interest in billing for services and most LHDs report revenue from third-party payers. The survey data indicate,

however that there is a lack of “empirical evidence measuring its practice or impact” (Etkind, Gehring, Ye, Kitlas & Pestronk, 2014). To date, there are no identified studies that focus specifically on using a large commercial claims database to examine billing codes for services rendered at LHDs.

Research questions

Findings from this study could provide valuable insight on a broader scale by contributing to a description of the current landscape for billing private health insurance for LHD services. On a narrower level, this information could inform state and local health department decision makers about how to approach their current billing infrastructure and practices for billing private health insurance.

The following questions are addressed in this study:

Research question 1: What types of LHD services are billed to private health insurance in different states?

Research question 2: What are the average billing amounts per service?

Research question 3: Are there geographical differences in the types of clinical and preventive services that are billed?

Research question 4: Has there been a change in the types of services being billed from 2010-2014?

Population

The population for this study includes those individuals under the age of 65 who used the local health department in any state to obtain any type of clinical or preventive service that is

considered billable. These clinical or preventive services correspond to specific billing codes captured in the Truven Health MarketScan® Claims Database.

CHAPTER 2

LITERATURE REVIEW

Approach to literature review

To provide context for this study, a literature review was performed using publication databases as well as organizational websites. The following databases were accessed in the Medical University of South Carolina (MUSC) library system: PubMed, CINAHL, SCOPUS, and Medline. Combined variations of the following terms were used to search peer-reviewed journals: *local health department, local public health, billing for services, billing for immunizations, billing for STD services, local health department billing, reimbursement, Affordable Care Act and local public health, reimbursement for clinical services, reimbursement for preventive services, third-party payer, and commercial health insurance*. A targeted search using the same publication databases was also performed on key authors identified in articles. Additional information relevant to local health departments and billing, such as presentations, research and issue briefs, webinars, and technical documents, was retrieved from the Centers for Disease Control and Prevention (CDC) and NACCHO websites.

It is important to understand how health departments are structured and their roles and responsibilities to the community in order to effectively describe the landscape for billing for clinical and preventive services at the local level. Within this context, this review first provides available historical information on billing for immunizations, sexually transmitted diseases (STDs), and other services. Second, it describes the impetus for billing at the local level. Finally, it identifies factors that have served as facilitators or barriers to seeking reimbursement for local health department services.

Description of local health departments

The overarching goals of public health are to prevent disease, promote health, and protect the health of the community. The Institutes of Medicine (IOM), in their hallmark reports on Public Health in the United States, introduced three core public health functions: Assessment, Policy Development, and Assurance, and later the 10 essential public health services:

1. monitor health status;
2. diagnose and investigate;
3. inform, educate, and empower;
4. mobilize community partnerships;
5. develop policies and plans;
6. enforce laws and regulations;
7. link people to needed services/care;
8. assure a competent workforce;
9. evaluate health services;
10. and research.

The core public health functions and essential health services are intended to provide the framework for public health and guide the work of federal, state, territorial, and local health entities (Public Health Steering Committee, 1995; IOM 1988, 2012). At the local level, the health department takes on these public health roles for its community. Aligned with this framework, NACCHO also introduced an operational definition for the ‘local health department’ which encompassed standards based on the Ten Essential Services. A local health department is defined as:

the governmental public health presence at the local level. It may be a locally governed health department, a branch of the state health department, a state-created district or region, a department governed by and serving a multi-county area, or any other arrangement that has governmental authority and is responsible for public health functions at the local level (NACCHO, 2005).

There are currently 2,800 LHDs operating in the U.S. (NACCHO, 2014). LHDs can be in urban or rural areas, and their size (small, medium, or large) is typically based on the population served. LHDs are categorized by the type of governance and structure; this affects how funding is allocated and decisions are made. The Association of State and Territorial Health Officials (ASTHO) classifies state and local health departments into four primary categories: 1) local/ decentralized - LHDs fall under a local government that also makes fiscal decisions, 2) mixed - some LHDs fall under state governance, others under local governance, 3) a state/centralized governance, and 4) a shared state and local governance (ASTHO, 2011). Additionally, decision making power can be organized in the following ways: 1) cabinet model where the governor, mayor or other executive authority formally appoints the agency head, 2) board-of health model where the health director reports to an appointed board of constituents, or 3) umbrella model where the health director is the agency head or reports to that agency's head (IOM, 1988).

Provision of services and funding

LHDs may differ in the types of services they provide to their respective communities. Historically, LHDs have provided direct health care and clinical services such as childhood immunizations, family planning, and prenatal care, creating a safety net for the most vulnerable - those individuals who are uninsured and underinsured. Many of these health department services

were provided free or at low cost to the community. In recent years, LHDs have made changes to these services for a variety of reasons including the impact of the recession, changes in healthcare with the passage of the ACA, and a national effort to have governmental public health agencies return to a more population-based focus (IOM, 2012; NACCHO, 2015). In the most recent NACCHO *Forces of Change* survey, over 70% of LHDs reported either reducing or expanding at least one program area between 2014-2015 (NACCHO, 2015). Preventive clinical services, such as immunizations, were reduced while services such as communicable disease screening and treatment were expanded (NACCHO, 2015).

There has been some disagreement about whether LHDs should continue to provide these direct services or shift to more population-based activities. Hsuan and Rodriguez (2014) examined factors that were associated with LHDs either adopting or discontinuing clinical and preventive services. They found that from 1997-2008, 22.2% of LHDs maintained or increased their clinical services. Their study drew on data from 198 LHDs that participated in two surveys: the 1998 and 2006 *National Longitudinal Study of the Local Public Health System* (NLSLPHS) and the 1997 and 2008 NACCHO *Profile Survey*. The authors identified three drivers that dictated leadership's decisions to provide clinical services at the local level: 1) the conflicting goal driver is the belief that providing clinical services conflicts with core public health functions, 2) the assurance goal driver is the belief that LHDs have a responsibility to provide services when there is limited access in the community for the most vulnerable, and 3) the entrepreneurial driver is the belief that clinical services can generate revenue to finance other needed public health services (Hsuan & Rodriguez, 2014).

When faced with changes, such as budget cuts, health departments may consider how to make changes to their infrastructure. One example of this was action taken by Kern County

Health Department in California. Kern County considered either reducing or eliminating their clinic services. They chose to establish a billing system to bill third-party payers for services and increased their revenue without making programmatic changes (NACCHO, 2014).

Funding for local public health services and programs originates from federal, state, and local sources. According to the most recent *Trust for America's Health* report, only 3% of health care spending is directed to public health (Trust for America's Health, 2017). The CDC, one of the primary authorities on public health in the United States, dedicates approximately 75% of its budget to support states, localities, and public/private programs. This budget, however, has declined and flattened since 2010. In fiscal year 2016, the CDC's budget was \$7.17 billion, which averages to \$22.26 per person. State public health spending has also remained level, and there is great variation in how funds are allocated at the state and local levels. Decisions around money allocation vary due to structure, size and determined public health priorities at the state and local levels. Table 1 shows the median and mean annual per capita expenditures and revenues by local health department characteristics. Local health department spending averages about \$55 per person. In general, per person spending decreases as the size of the population served by a local health department increases (Trust for America's Health, 2017).

Economic recession

The economic recession also presented some new challenges to public health. The financial crisis of 2007-2008 led to significant loss of funding for local public health resulting in reductions and cuts in programs and jobs. NACCHO reported that local health departments have eliminated 51,700 jobs since 2008 as a result of staff layoffs, hiring freezes, and budget cuts; 2009 was the highest year with 16,000 jobs lost, 2014 the lowest with 3,400 jobs lost

(NACCHO, 2015). Shah, Ye, Leep, and Leider (2016) examined strategies that local health departments used to deal with the negative impact of the recession. NACCHO's 2012 survey on *Job Loss and Program Cuts* identified 19 strategies used by LHDs to deal with the impact of the recession. Seeking fees for services was identified as one mechanism that could minimize the impact to local health department service provision.

The authors asked two questions to explore the types of strategies used: *“Since the recession began in December 2007, what specific strategies are used by LHDs to manage program and/or staffing cuts in an effort to minimize the negative impact on services to the community”* and *“Do the types of strategies and the prevalence of their use differ across LHDs serving different jurisdictional sizes?”* Strategies were organized into the following categories: 1) adjustments pertaining to workforce, 2) changes in budget or revenue, 3) service referrals or broader cuts before program elimination, 4) contracting out services/employees, and 5) resource sharing. Local health departments were grouped in three categories based on size: < 25,000, 25,000-99,999, and 100,000 or greater. The authors found that strategy choice varied with the size of the population served by the health department. While charging fees for services or increasing fees for services was the third most frequent strategy for smaller LHDs, those serving less than 25,000; it was less important (5th) for larger LHDs. The authors also found that 35% of LHDs reported increased billing to insurance or introduction of billing for services rendered.

This study demonstrates that local health departments have taken different avenues to address funding shortfalls. Although charging clients for services provided and seeking reimbursement from health insurance companies is a mechanism used by LHDs, there is a great deal of variation in approach. Additionally, the size of the community served by the LHD may determine which strategies are viewed as more beneficial or easier to employ.

In examining LHD characteristics of resiliency during the 2008 recession, Erwin and colleagues (2014) studied organizational, financial, and service related factors as part of the 2005 and 2010 NACCHO *Profile Surveys*. Although the study did not look specifically at private insurance billing, it did find that the more resilient health departments (defined as able to maintain a budget during the recession) relied less on local sources of revenue. When circumstances drove LHDs to make cuts to clinical and preventive services, some LHDs tried to find alternative ways to sustain these services for their communities (NACCHO, 2015).

Impetus for billing

Most clinical and preventive services provided by LHDs are reimbursable by third-party payers if they have procedure codes associated with them (NACCHO, 2013). This includes assessment, diagnosis, prevention, and treatment services. However, there may be some variation in what is considered a billable service based on the contracts set up with individual health insurance companies (NACCHO, 2013). In addition to generating revenue, there are several factors that have motivated LHDs to establish systems to bill health insurance for services provided to clients. Changes brought on by the ACA which led to more insured individuals, shrinking budgets, and mandates on federal funding are among the main reasons. The CDC outlined the four main reasons explaining why health insurance plans should be billed for clinical services, such as immunizations, provided by health department clinics: 1) *Equity*, 2) *Common sense*, 3) *Stewardship*, and 4) *Preparedness* (Kilgus, 2011). *Equity* indicates that a public health department should be considered a provider and reimbursed for services just as any other health care provider. *Common sense* refers to appropriate use of available funds. For example, if clients pay into an individual or employer-sponsored insurance health plan, then federal dollars should

not be used to pay for those clinical services (e.g., vaccines). *Stewardship* describes appropriate use of limited public health resources. Public health resources should not be used by health departments to cover the cost of services that are already covered by private insurance. Finally, *preparedness* refers to the ability for LHDs to generate local revenue by seeking reimbursement from third-party payers.

The ACA aimed to improve access, affordability, and quality of healthcare for individuals who were uninsured or underinsured (U.S. Department of Health and Human Services, 2013). As part of ACA guidelines, all insurance plans sold in the marketplace included “safety net providers” as 20% of its in-network provider list. Local health departments fall under this “safety net provider” category. Federal guidelines also mandated how certain federal program funding should be used at the local level. For example, the Federal Immunization Grant Program (Section 317) for childhood immunizations and 340B funds for sexually transmitted disease (STD) services cannot be used to pay for services rendered to those clients who hold private insurance. Inappropriate use of these funds can lead to consequences such as loss of program funding (NACCHO, 2014).

Billing for immunization services

Immunization is one of the first clinical service areas for which reimbursement from third-party payers was pursued. Childhood, school, and adolescent immunizations are considered essential services by most health departments. Traditionally, health departments have provided these immunization services to the community, primarily for those individuals who are uninsured or underinsured. Most of the early literature on revenue and local health departments focuses on immunization services. The number of required vaccines has increased but the funding available

to LHDs to purchase these vaccines has not aligned with the needs. For example, the cost to purchase recommended vaccines for children increased 360% while purchase funding only increased 24% during the same time (Kilgus, 2011). Billing for immunizations increased over the last decade. For example, Santoli, Barker, Lyons, Gandhi, Philips, and Rodewald (2001) found that only 31% of health departments across the U.S. billed insurance for immunizations services provided in public health clinics to insured clients. Although there may be other drivers for the increase in billing for immunizations, the primary reason is the CDC prohibition against the use of funds from the Federal Immunization Grant Program (Section 317) for immunizations for insured children in October 2012 (Kilgus & Redmon, 2013). The intent behind this was to ensure that federally purchased vaccine was correctly used only for uninsured or underinsured individuals. Shortly thereafter, the CDC introduced the Billables Project to provide guidance and financially support state and local initiatives to bill third-party payers including Medicare, Medicaid, and private insurance for services.

Billing for immunizations can generate significant revenue that can be used to sustain core public health functions. For example, the health department in Maricopa County, Arizona, reported collecting over \$2 million from private insurers in calendar year 2013 (England, 2015). Even with vaccine supply and other expenses, this was a net gain of 21.5%. However, the author indicated that revenue should not be the only consideration. Billing for a service like immunization can have more global, unintended consequences if it means clients may be turned away or a service provision gap is created between private providers and the health department for necessary vaccinations. This can potentially put herd immunity at risk and increase the spread of communicable disease (England, 2015). Local health department clinics provide an immunization safety net to vulnerable children and adolescents despite public entitlement

programs such as the Vaccines for Children (VFC) and Children's Health Insurance (Santoli, Barker, Lyons, Gandhi, Phillips & Rodewald, 2001).

Billables Project

In 2009, the Centers for Disease Control and Prevention (CDC) introduced the Billables Project: Health Department Immunization Services Reimbursement. The goal of the Billables Project was to formally assist health departments to develop the capacity to bill health insurance companies for childhood and adult immunization services provided to insured clients at health department clinics (CDC, 2016; Etkind, 2014). This initiative was supported by monies from the federal American Recovery and Reinvestment Act of 2009 (ARRA) and 317 funds (CDC, 2016; Kilgus and Redmon, 2014). Increased cost of vaccines and decreased funding gave birth to the idea that revenue generated through billing could be used to expand immunization services at both the local and state levels.

Through the Billables Project, the CDC awarded \$27.5 million to 38 local and state health department grantees. Local and state health departments could use the available funding to support any stage of the billing process from infrastructure planning and development to implementation. Awardees were tasked with developing action plans that described activities, protocols, and procedures needed at their respective agencies to pilot, implement and sustain a successful billing program for immunization services (CDC, 2016).

As part of this initiative, the CDC also provided funding to the National Association of County and City Health Officials (NACCHO), a Washington, DC-based organization representing 2,800 local health department across the US. In 2011, NACCHO launched an online resource guide named the Billing for Clinical Resources Toolkit which consisted of

approximately 300 resources, templates, and manuals collected from state billing guides, the Centers for Medicare and Medicaid Services, states and local health departments, insurance companies, and electronic medical record and billing clearinghouse vendors (NACCHO, 2017). The site also provided a forum for local and state health departments to share success stories, resources, and their respective experiences about efforts to set up infrastructure for billing and build capacity around billing third-party payers for services. As of February 1, 2016, NACCHO stopped updating this toolkit but resources are still accessible through the archive to users who create an account.

The Billables Project is an example of federal support and acknowledgment of the importance of local and state infrastructure to seek reimbursement for services rendered to those individuals with public or private health insurance. Since its inception, states have passed legislation in support of billing for immunization services at the local level (CDC, 2015).

Billing for STI/STD services

More recently, LHDs initiated billing for provision of STD-related services. Two federal efforts to support expansion of HIV and STD testing included funding that promoted the implementation of systems to support reimbursement from third-party payers for STD-related services. The first initiative began in January 2012 when the CDC introduced a five-year HIV prevention funding cycle called *PS12-1201: Comprehensive Human Immunodeficiency Virus (HIV) Prevention Programs for Health Departments*. Funding to states and territories supported testing costs and disease intervention specialists (DIS). Grant recipients were expected to seek reimbursement for HIV testing from third-party payers and redirect 19% of their budgets to support implementation of third-party billing (CDC, 2017). Subsequently, in January 2014, the

CDC launched an initiative called *Improving Sexually Transmitted Disease Programs through Assessment, Assurance, Policy Development, and Prevention Strategies* (STD-AAPPS). This initiative provided funding through 2018 to 50 states, seven cities, and two territories to decrease the burden and long-term health effects of STDs. Similar to the immunization Billables Project, the CDC funded the STD-Related Reproductive Health Training and Technical Assistance Center (TAC), to support billing for STD services in publicly funded clinics and public health labs. The purpose of the TAC was to provide support to grantees in their development of programs to support STD surveillance, electronic laboratory reporting, expanded meaningful use, and billing efforts to seek reimbursement for STD-related services (CDC, 2015). A toolkit was also created to provide guidance around billing system infrastructure elements such as: decision making to bill, developing billing systems, managing revenue cycles, initiating contracting, and enhancing coding capacity (CDC, 2015; STD TAC, 2017).

STD-related services have traditionally been offered free of charge, so a shift to billing is a change in practice. Free services date back to the 1940s and 1950s when laws were implemented in response to various STD-related epidemics, such as syphilis, to ensure access to care for all individuals. The U.S. Public Health Service advocated for state laws so individuals could obtain confidential treatment somewhere other than with their private providers. The laws also promoted state responsibility for containing STDs (NCDS, 2016). Until recently, many states and localities, such as New York, Pennsylvania, West Virginia, and North Carolina, still had codes in place that required all STD-related services provided by state and local health departments to be free to all clients (Kovar & Carter, 2017; NCDS, 2016).

Several studies have assessed the impact of billing for STD-related services on health department staff and clients. In a study by Kovar and Carter (2017), 183 staff across 25 eastern

North Carolina health departments or districts were asked about their knowledge of reimbursement for STD services, their attitudes towards seeking reimbursement, and current practices around billing. Eighty-seven percent (87%) of respondents were not aware that STD services were reimbursable by third-party payers; 92% found it to be an acceptable practice; and 54.6% reported supporting billing responsible sources. When examining current billing practices, Medicaid was billed most often (92%); 80% billed commercial insurance, but it was limited only to Blue Cross and Blue Shield. Among studies with STD clinic clients, confidentiality and sharing information with insurance companies were identified as key issues of concern (Hoover, Parsell, Leichliter, Habel, Tao, Pearson, & Gift, 2015; Washburn, Goodwin, Pathela & Blank, 2014; Pearson, Cramer, Tao, Leichliter, Gift & Hoover, 2016).

Washburn and colleagues (2014) surveyed 5017 clients in a New York City health department STD clinic to gather feedback prior to transitioning to a billing system for services (sliding scale for clients and billing insurance). The anonymous surveys included questions about the type of health insurance, willingness to share insurance information with the clinic or receive an explanation of benefits (EOB) letter, concerns over sharing insurance information, willingness to continue to access the clinic if charged for services, and the price range clients would be willing to pay if self-pay. Half of those who were insured (48.4%) stated they would not be willing to share insurance information with the STD clinics, respondents with Medicaid were more willing to share insurance information compared to privately insured (the authors noted that Medicaid does not send an EOB while private insurance does). Adolescents were most likely to report that they would stop accessing services if there was a fee; 52.1% said they would refuse to pay a fee. Additionally, 67.3% of adolescents who had private insurance expressed concern about EOB sent to their home (47.4% of all privately insured had concerns about EOB). The

authors also projected the amount of revenue (\$4,367,750) that could potentially be collected from insurance billing and sliding scale fees in one year of STD service delivery. This was based on total number of visits in 2012 and billable STD encounters. Responses related to willingness to pay and amount of payment were used to project potential annual per capita visit revenues.

Hoover and colleagues (2015) surveyed 4,364 STD clients in clinics across the U.S. that were: 1) in metropolitan statistical areas with the highest rates of chlamydia, gonorrhea, and syphilis and 2) publicly funded. Clients were asked about health care access and use, main reasons for choosing the STD clinic for care, alternate options for care, health insurance, and willingness to use health insurance for STD services. Clients indicated that the main reasons for seeking care at the STD clinics was access to walk-in or same day appointment, low cost and expert care. Among surveyed clients, 40.6% had health insurance (11.9% had private); fewer than half with private insurance or parents' insurance indicated willingness to use it. This was compared to 62.7% with Medicaid. Among those uninsured, 27.6% males and 36.0% of females reported cost as reason for selecting clinic. Study results indicated that clients chose the STD clinic even though they had access to other providers (Hoover, Parsell, Leichter, Habel, Tao, Pearson & Gift, 2015).

Another survey of STD clinic clients across 21 U.S. metropolitan STD clinics, also indicated willingness to use public health insurance over private. Out of 4,300 participants, 40% had some type of insurance (30.7% private, 47.8% government, 21.5% parents'). Of the 1722 insured participants, 48.6% indicated that they would be willing to use their insurance. Clients who had public insurance were more likely to be willing to use it compared to clients covered under private insurance or their parents' insurance. Of those who were not willing to use insurance, two thirds were related to privacy issues; one third related to out-of-pocket cost.

Privacy concerns included unwillingness to share information with insurance companies, concerns about insurance companies and providers sending records home, and concerns about spouses, significant others or parents finding out about clinic visits (Pearson, Cramer, Tao, Leichter, Gift & Hoover, 2016).

The National Coalition of STD Directors (NCSD) indicated that billing third-party payers, such as commercial and private insurance, provides an important revenue source that can help to close existing budget gaps and support STD program sustainability (NCSD, 2016). However, in a needs assessment conducted by the STD TAC, only 45% of STD-certified 340B clinics billed both Medicaid and third-party payers; 30% billed Medicaid only, and 25% did not bill Medicaid or other third-party payers. Health departments were among those clinics that were less likely to bill private insurance; the reason indicated was less capacity to bill (Kawatu, Krasner, Hamby, Meersman, Higgins-Biddle, Lui, Hook, Tuchman & Kaziunas, 2014). There is evidence that barriers to billing for STD-related services exist not only among infrastructure at local health departments but also among staff and clients.

Billing for other services

In 2010, 88% of LHDs reported revenue from Medicaid, Medicare or other sources; in 2013, 90% reported revenue from these sources (Etkind, et al., 2014). Findings from the 2014 NACCHO Forces of Change survey show that most LHDs surveyed (86%) billed for at least one clinical or preventive survey. Out of 648 LHDs, the top 10 services billed include family planning (85%), immunization (84%), home health (77%), early childhood development (63%), cancer screening (59%), behavioral health or substance abuse (56%), HIV or STI (51%), tuberculosis testing/treatment (46%), chronic disease screening or management (34%) and

tobacco cessation (8%) (NACCHO, 2014). Although the majority of LHDs billed public (Medicaid and Medicare) and private insurers for services, 14% reported not billing for any services provided to their clients (NACCHO, 2014). Among those that reported not billing for any services, some were making strides to establish the infrastructure to bill Medicaid (30%), Medicare (16%), and private insurers (20%). In addition to immunizations, LHDs have experience billing for other services. Lindley (2013) looked at billing practices during the H1N1 pandemic. The author found that despite previous experience billing for seasonal influenza, most LHDs did not bill for H1N1 vaccine. Only 20% (57 out of 297 respondents) reported billing insurance, 74% of those billed Medicare, 80% billed Medicaid, and 55% billed private insurance. In addition to surveys, semi-structured interviews with nine LHDs were used to gather information about billing practices such as prior billing experience, methods for collecting insurance information, estimates of which claims were paid, and barriers to billing for the H1N1 vaccine. Barriers included variable billing practices among private insurers, the system created for H1N1 vaccine billing, and a need for clarity in CDC's guidance on billing (Lindley, 2013).

Identified barriers to billing

NACCHO identified several barriers to third-party billing at the local health department level in their policy statement on billing. These barriers relate to time, training, credentialing, information sharing, and staffing (NACCHO, 2016). First, developing a billing infrastructure takes time and expertise that may not be readily available. Administrative staff require training specifically around how to work with credentialing health plans; current staff may be inadequately trained. There is also a lack of understanding among health insurance companies that the LHD is considered a provider for reimbursement purposes. This can lead to difficulty in establishing contracts between LHDs and health plans. Confidentiality and sharing of protected

health information (PHI) are also factors that need consideration. Mechanisms for sharing private information, such as tax IDs, between county agencies and hospitals may not exist. Finally, credentialing can be a long and complicated process. Key staff who are credentialed may leave their local health department agencies which triggers a restart in the credentialing process (NACCHO, 2016).

Even with a billing infrastructure in place, there is a need to streamline billing practices. McCullough (2016) identified a delay between when services were rendered to time of reimbursement from third-party payers in a study on billing in three county immunization clinics in Maricopa County, Arizona. The study looked specifically at credit and debit transactions for immunizations over a period of 1 ½ years. The median was 68 days for third-party reimbursement for services with no significant differences between Medicaid and private insurance. Although 85% of revenue was collected during the same budget year, 15% was received in the following budget year. Debit transactions took a significantly shorter time than did credit transactions, and reimbursements sometimes took multiple transactions to process. These delays can complicate how local budgets are planned for the following fiscal year and how money is allocated for local health department programs and services (McCullough, 2016).

Lindley (2013) found that LHDs that were most successful with their billing experience during the H1N1 pandemic had certain factors in common: prior billing experience, enlisting assistance by contracting with organizations that had billing experience, hiring additional billing staff, and providing training to current staff. In addition to identifying and addressing barriers, LHDs may need additional training and technical assistance to assess the cost benefit of billing for services, learn how to access information about insurers' credentialing process, and set up internal quality control processes (Etkind, Gehring, Ye, Kitlas, & Pestronk, 2014).

CHAPTER 3

METHODOLOGY

Study Design

This study was a retrospective analysis of 2010-2014 archival billing data from the Truven Health MarketScan® Research Databases. This billing database draws information from insurance claims filed for individuals with health insurance including employed individuals and their dependents; early retirees; Consolidated Omnibus Budget Reconciliation Act (COBRA) recipients; and Medicare-eligible retirees with employer-provided Medicare Supplemental plans (Truven Health MarketScan® Research Databases, 2014). The MarketScan Research Databases include over 20 billion service records and private sector health data from approximately 350 payers. There are six separate database categories within Truven Health MarketScan®:

1) Commercial Claims and Encounters, 2) Medicare Supplemental, 3) Health and Productivity, 4) Benefit Plan Design, 5) Medicaid, and 6) MarketScan Lab (Truven Health MarketScan® Research Databases, 2014). For this study, only data from the Commercial Claims and Encounters database category were accessed.

Data from the Commercial Claims and Encounters Database, specifically claims made for outpatient services received at a health department, were retrieved into SAS. The MarketScan database defines claims data as *“Information that comes from provider claims to third-party payers. Claims data usually include personal patient identifying information, the services performed, and the amount paid by the patient. Claim forms are generally used by enrollees of standard indemnity plans (i.e. fee-for-service plans)”* (Truven Health MarketScan® Research Databases, 2014, p. 25). Public health departments are considered outpatient facilities and are identified with a 750 provider code in this database. The MarketScan® database does not provide

level of detail about the type of health department (e.g., city, county, state) therefore, data for a state may include any type of facility that has self-identified as a public health department and bills for health services. Facilities such as Federally Qualified Health Centers (FQHCs) and free clinics are designated with their own provider codes and would not be included in the sample. The population for this study is privately insured patients under the age of 65 who received billable services at a public health department.

Description of methodology and analysis

All outpatient bills with a provider code of 750, which indicates a public health department, were extracted from the MarketScan® Database for available years 2010-2014. These represent bills that were paid for services rendered at any public health department facilities in the United states. Current procedure terminology (CPT) codes were used. CPT codes were developed by the American Medical Association (AMA) in 1966 to create a common language to describe medical, surgical, and diagnostic services. Each CPT is a five-character, alphanumeric code that corresponds to a particular service (AMA, 2017). CPT codes are used to report services to health insurance for reimbursement. For this study, CPT codes related to immunizations, maternity, family planning, STI, and TB services were used (Appendix A). These service areas were chosen for two main reasons: they were identified in the literature as those that were billed most frequently, and they are also known as more ‘traditional’ services provided by health departments. Other billed services included in the analysis were represented in the ‘Other’ category. The ‘Other’ category includes services such as home health, early childhood development, cancer screening, tobacco cessation, chronic disease management, and substance abuse/behavioral health. Codes were pulled from a variety of sources including encounter forms,

state code books, and other available and relevant resources (e.g., CDC, and STD technical assistance center). Although CPT codes are updated annually, the latest available codes were used. The final code list was also compared to the 2014 AMA code book and verified by an outside researcher from MUSC.

The following variables were used in this study: CPT billing codes, total payment per event, and total patient share of payment. The following questions were examined: What is the frequency of billing codes? For what types of services? How much is being billed? What is the average billing amount? What is the amount of revenue generated? How much of the bill is being paid/reimbursed?

Data were extracted into SAS. Microsoft Excel was used for data analysis to calculate total sums, means, and frequencies. Descriptive statistics and graphic displays of results were used to illustrate the LHD billing landscape for private insurance. Because this was a descriptive study, no hypotheses were tested. The goal was to get a better understanding of the breadth and magnitude of the problem and determine the types of services that may be worth the effort of billing to generate revenue for local public health.

De-identified billing data were used. Therefore, this study was considered exempt from human subject Institutional Review Board (IRB) approval by the Medical University of South Carolina.

Study objectives

In examining the current billing landscape for local public health, the study objectives included the following:

1. Determine the average annual billing amounts for clinical and preventive services.

2. Determine total pay and out of pocket costs for different services.
3. Describe the types of LHD services that are billed to commercial (private) health insurance in different regions of the U.S.
4. Describe changes since 2010 and the implementation of the Affordable Care Act (ACA).

CHAPTER 4
RESULTS

Claims data extracted from the MarketScan® database provide information about reimbursements for services made to health departments as well as the burden to clients (out of pocket costs). Total Achieved amounts are the sum of Total Pay and Total Out of Pocket. Table 1 displays the total amount reimbursed to health departments for services over a five-year period, the total out of pocket cost to clients, the total achieved, and average amounts over time. Proportion of the total pay and out of pocket costs of the total achieved are also displayed. Reimbursement to health departments increased over time, with a Total Pay average over time of \$30.2M. Health departments received the largest reimbursement from private health insurance for services rendered in 2012. However, 2012 was also the year with the highest out of pocket cost to clients.

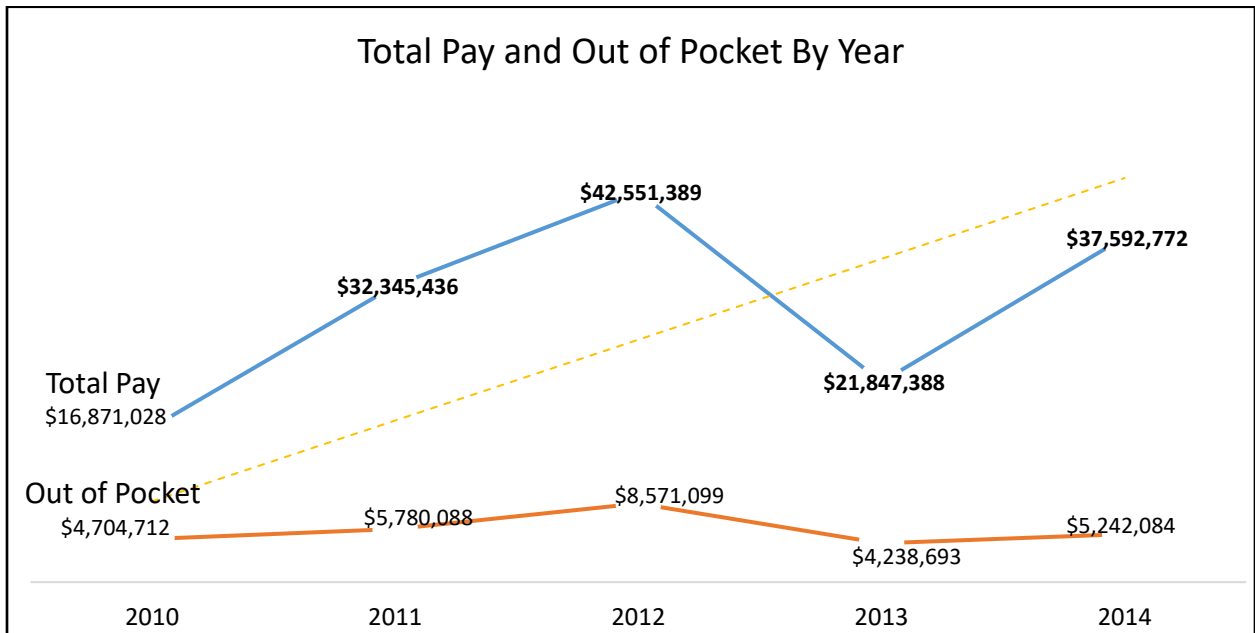
Table 1

Total Pay, Total Achieved, Total Out of Pocket 2010-2014

| <u>Year</u> | <u>Total Pay</u> | <u>Total Out of Pocket</u> | <u>Total Achieved</u> | <u>%Total Pay</u> | <u>%Out of Pocket</u> |
|-------------------|------------------|----------------------------|-----------------------|-------------------|-----------------------|
| 2010 | \$16,871,028 | \$4,704,712 | \$21,575,740 | 78% | 22% |
| 2011 | \$32,345,436 | \$5,780,088 | \$26,565,348 | 85% | 15% |
| 2012 | \$42,551,389 | \$8,571,099 | \$33,980,290 | 83% | 17% |
| 2013 | \$21,847,388 | \$4,238,693 | \$17,608,695 | 84% | 16% |
| 2014 | \$37,592,772 | \$5,242,084 | \$32,350,688 | 88% | 12% |
| Average over time | \$30,241,603 | \$5,707,335 | \$24,534,267 | 84% | 16% |

From 2010 to 2014, Total Pay increased by 123% with \$16,871,028 in 2010 and \$37,592,772 in 2014 (Figure 1). Total Pay was at its highest peak in 2012 with \$42,551,389, an increase of 152% from 2010. From 2010 to 2014, the Out of Pocket Total increased 11% with \$4,704,712 in 2010 and \$5,242,084 in 2014. The Total Out of Pocket was at its highest peak in 2012 (\$8,571,099); an increase of 82% from 2010. Figure 1 also shows trend in Total Pay and Total Out of Pocket expenses from 2010 to 2014. The trendline indicates an upward trend in Total Pay and Total Out of Pocket over the five-year period. The data show a dip in both Total Pay and Total Out of Pocket costs from 2012 to 2013.

Figure 1
Total Pay and Out of Pocket by Year



Census regions

The U.S. Census Bureau organizes states into four census regions which are further divided into two or more census divisions (U.S. Census Bureau, 2015). For the purposes of this analysis, regional designations were used to examine geographical variations in reimbursement and out of pocket costs for health department services. The Northeast includes New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) and Middle Atlantic (New Jersey, New York, Pennsylvania) states. The Midwest includes East North Central (Indiana, Illinois, Michigan, Ohio, Wisconsin) and West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota) states. The South includes South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia), East South Central (Alabama, Kentucky, Mississippi, Tennessee), and West South Central (Arkansas, Louisiana, Oklahoma, Texas) states. The West includes Mountain (Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming) and Pacific (Alaska, California, Hawaii, Oregon, Washington) states. Appendix B provides a detailed Census Bureau Region Map.

Total costs were aggregated by census region. The Northeast had higher percentages of out of pocket payouts compared to the other regions (Figure 2). The South, West and Midwest were below the average out of pocket percentages from 2010 to 2014 (Table 2). Between 2010 and 2014, the average percentages towards out of pocket costs significantly decreased by 14 percentage points. The Northeast region decreased by 43 percentage points between 2010 and 2014 (Figure 2).

Figure 2
Percentage of Out of Pocket by Region

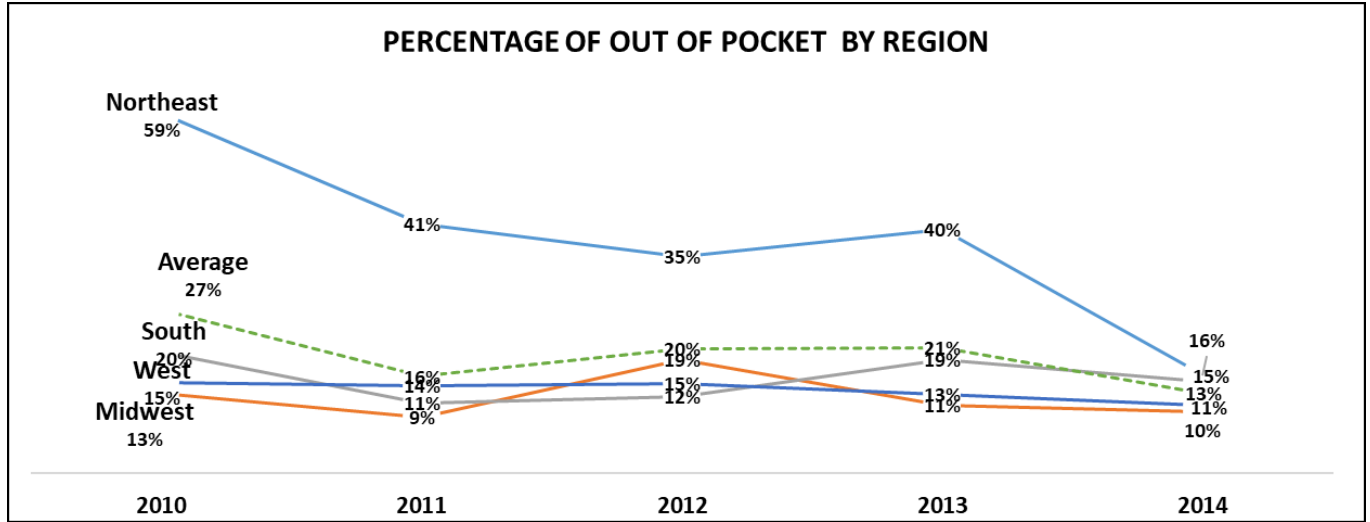


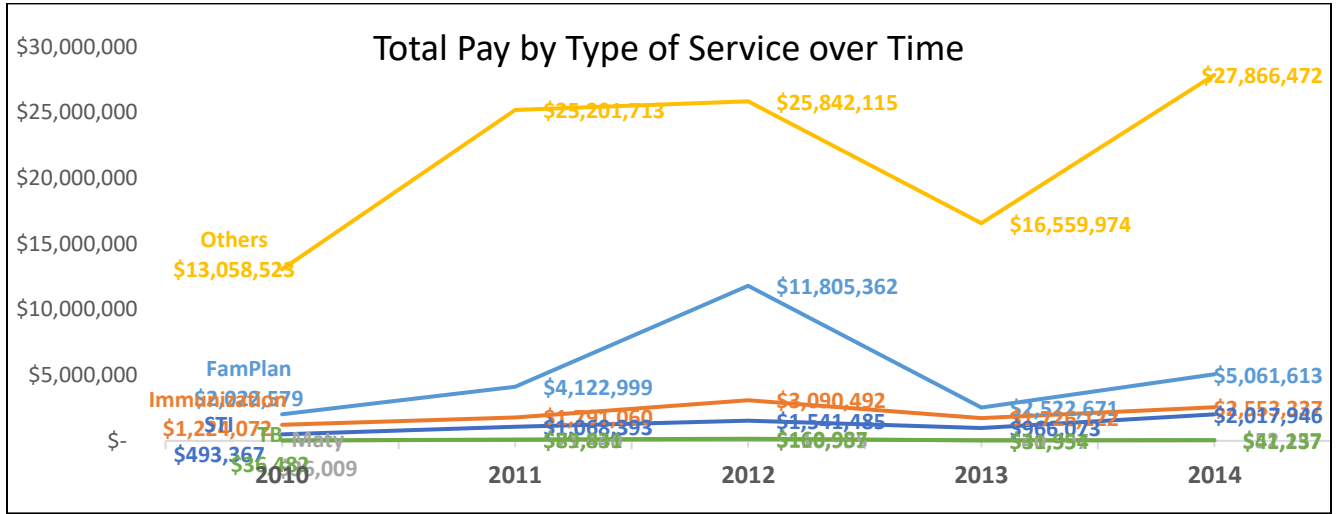
Table 2
Percentage of Out of Pocket Cost by Region

| | <u>Northeast</u> | <u>Midwest</u> | <u>South</u> | <u>West</u> | <u>Total</u> |
|------|------------------|----------------|--------------|-------------|--------------|
| 2010 | 37% | 15% | 25% | 17% | 28% |
| 2011 | 29% | 10% | 13% | 17% | 18% |
| 2012 | 26% | 23% | 14% | 17% | 20% |
| 2013 | 28% | 12% | 23% | 15% | 19% |
| 2014 | 14% | 11% | 18% | 12% | 14% |

Health Department Service Areas

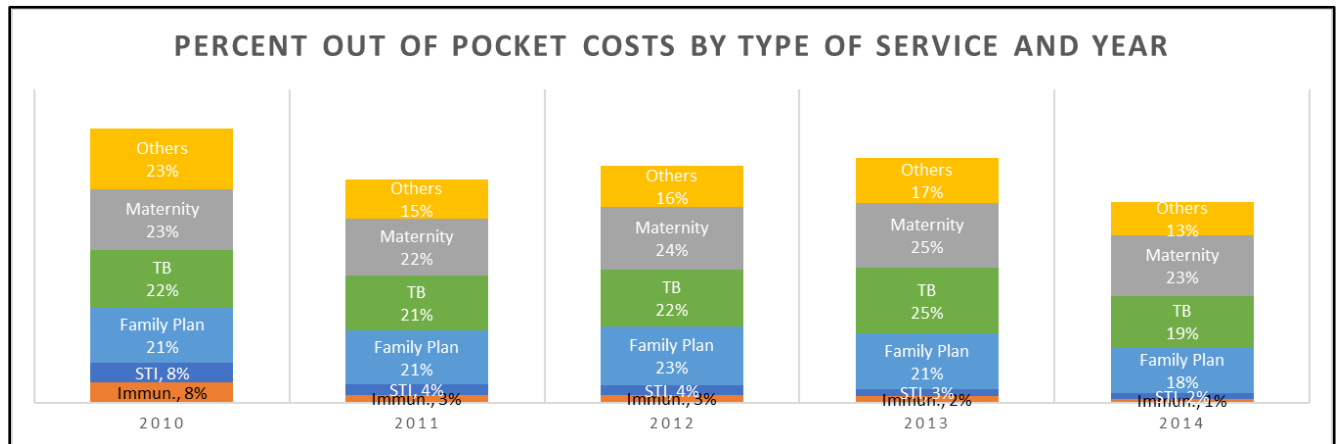
Health department service areas examined in this study include Immunizations, Maternity, Family Planning, TB, and STI. Over a five-year period, Other Services had the highest total pay, ranging from \$13M in 2010 to \$27.8M in 2014 (Figure 3). This was followed by Family Planning. STI services had the lowest total pay with \$493,367 in 2010, increasing to just over \$2M in 2014.

Figure 3
Total Pay by Type of Service Over Time



Over the period examined 2010-2014, the percentage of out of pocket costs for clients decreased across all health department service areas (Figure 4).

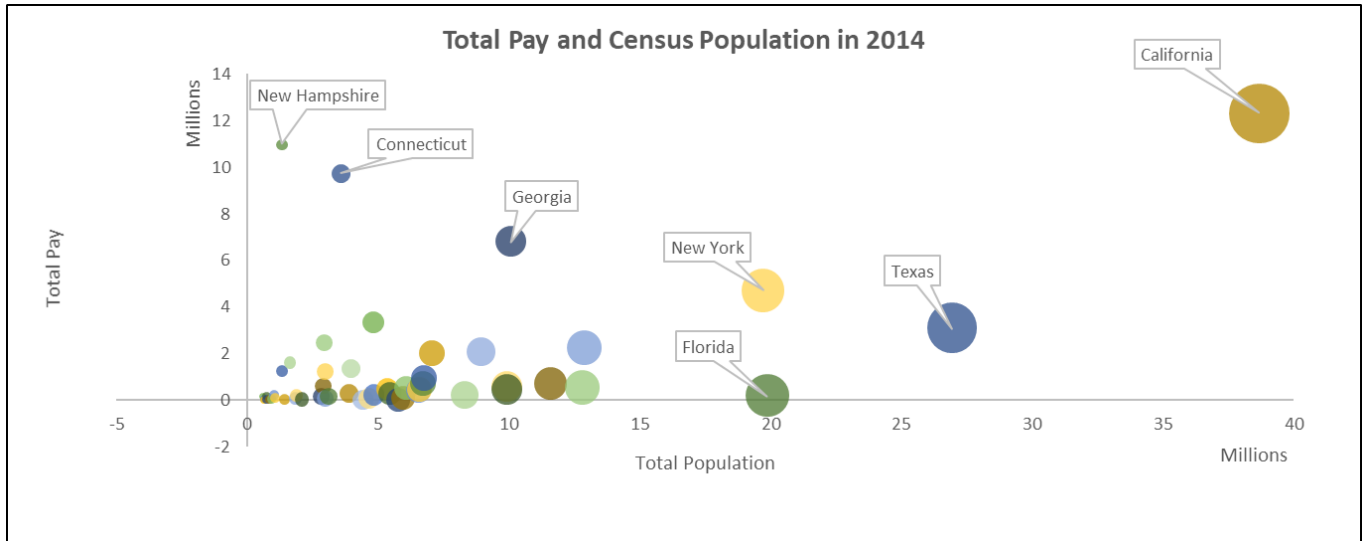
Figure 4
Percent Out of Pocket Costs by Type of Service and Year



The last data year used in this study was 2014. Several variables were examined more closely for this year. Total cost was aggregated by state and reported per million. Using census data, states with larger populations such as California, Florida, Texas, and New York had

variations in total pay. In 2014, California had the largest population and the largest total cost per million, with over \$12M in Total Pay. Texas, the second largest state had less than \$4M in Total Pay (Figure 5).

Figure 5
Total Pay and Census Population (2014)



Per capita personal income by state for 2014 was used to compare to Total Pay and Out of Pocket costs (SSTI, 2016). Figure 6 compares Total Pay to per capita income in states in 2014. The District of Columbia had the highest per capita income in 2014 (\$70K) but also the lowest Total Pay to health departments (\$8,286). California shows a high per capita income (approximately \$50K) and the highest Total Pay (\$6M) in 2014.

Figure 6
Total Pay by Per Capita Income in States (2014)

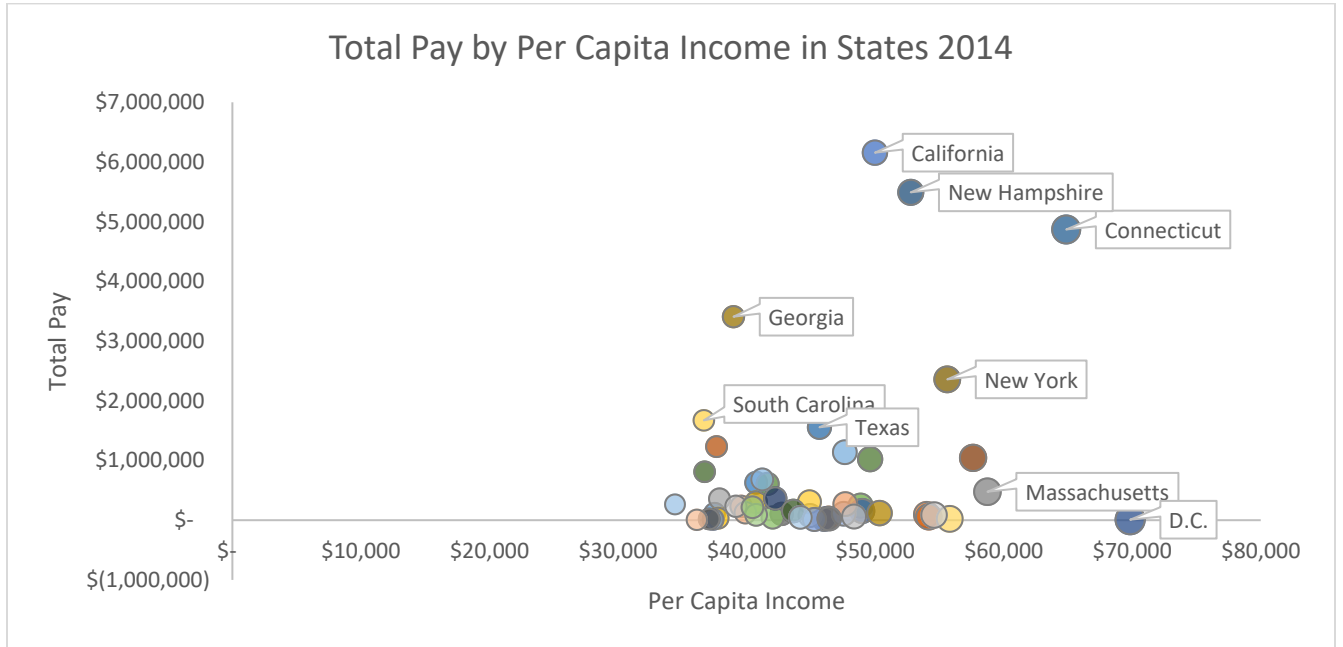


Figure 7 displays Total Out of Pocket by per capita income in states. Arkansas health department clients had the highest out of pocket costs (over \$800,000) per capita income (approximately \$50K) in 2014.

Figure 7
Total Out of Pocket by Per Capita Income in States (2014)

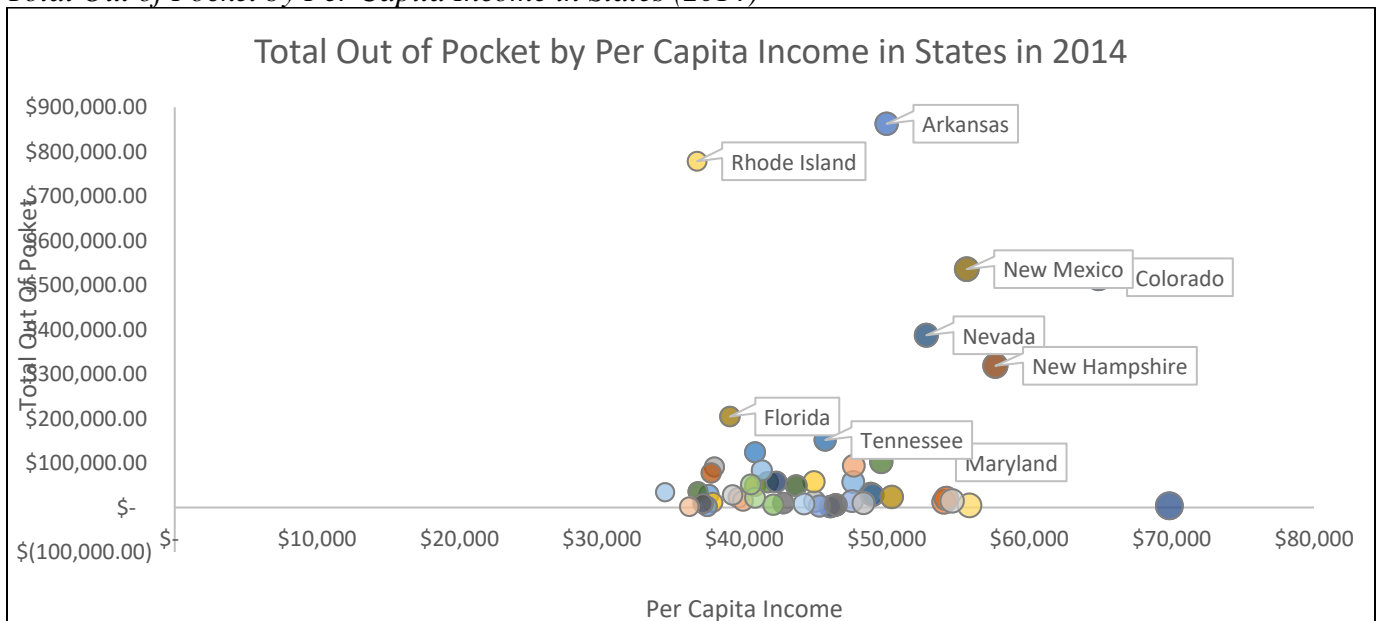


Figure 8 shows the distribution of types of services within Total Pay. In 2014, the Other Services category accounted for 74% of the overall amount of Total Pay to health departments. Family Planning, Immunization, and STI services together accounted for 25% of the total pay.

Figure 8
Distribution of Services of Total Pay (2014)

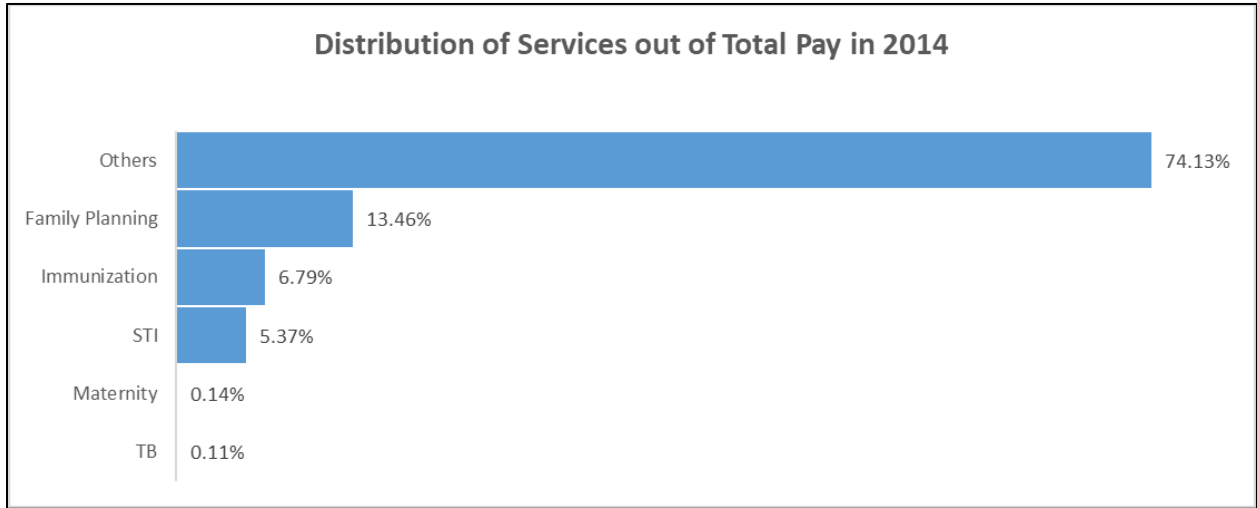


Figure 9 shows the distribution of types of services within Out of Pocket costs. In 2014, 23% of the full cost of Maternity services was paid out of pocket by clients. Immunization services (1%) accounted for the lowest percent of Out of Pocket costs.

Figure 9
Distribution of Services Out of Pocket (2014)

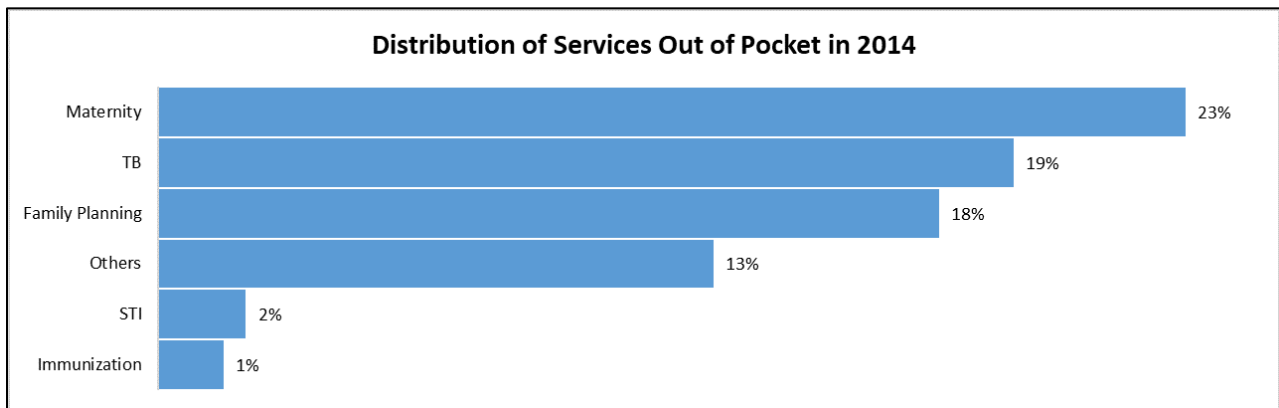
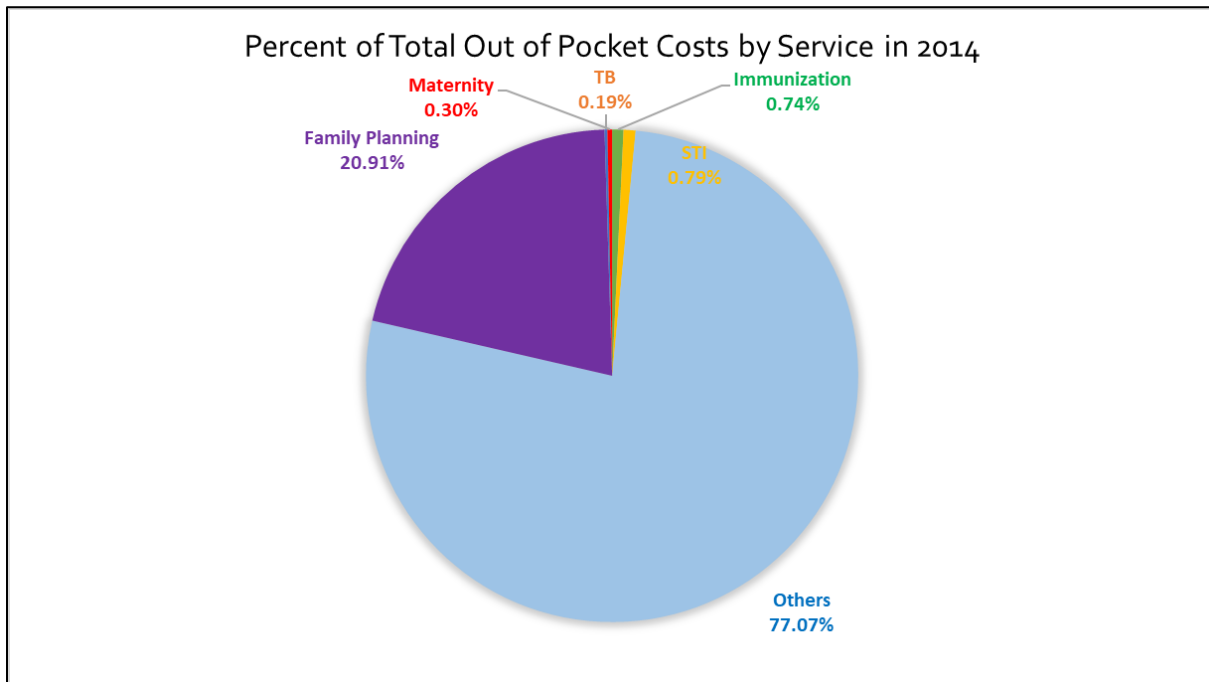


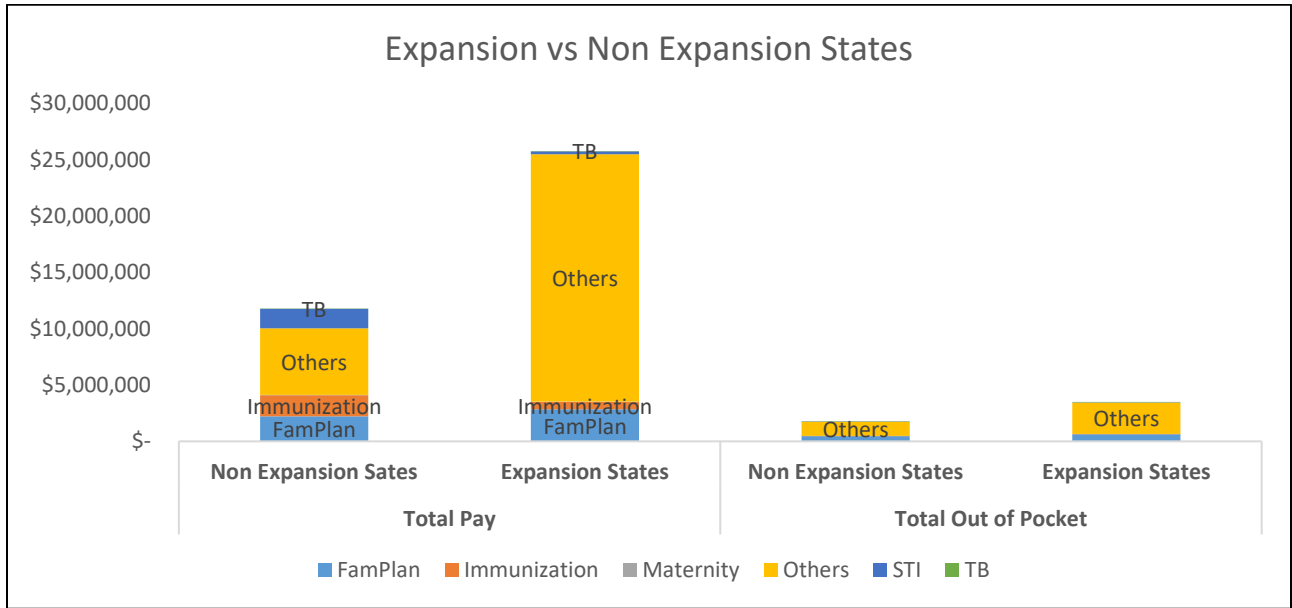
Figure 10 shows the distribution of Out of Pocket costs by types of services out of Total Achieved. Out of Pocket costs account for 12% of the Total Achieved cost; \$5.2M out of the \$42M total cost in claims. Within the grand total Out of Pocket costs, 77% falls under the Other Services category (\$4M), and approximately 21% for Family Planning services (\$1M). Maternity services had the lowest Out of Pocket expenses (0.3%) followed by Immunizations (0.74%), approximately \$55,000 in total Out of Pocket costs.

Figure 10
Percent of Total Out of Pocket Costs by Service (2014)



In 2014, states that chose to expand Medicaid paid more in health care than those that did not expand; \$26M compared to \$12M. Non-expansion states had less out of pocket burden on clients than expansion states; approximately \$1.8M compared to \$3.5M. A list of Medicaid expansion states is included in Appendix C. SAS summary data is include in Appendix D.

Figure 11
Total Pay and Total Out of Pocket in Medicaid Expansion vs. Non-Expansion States (2014)



CHAPTER 5

DISCUSSION

Summary of findings

An examination of private insurance claims data over a five-year period shows variations in the amounts that health departments are reimbursed for services and the out of pocket costs to clients. This study aimed to describe the services billed to private health insurance, identify geographic differences, and describe changes over time.

The main study findings indicate increases in total reimbursement to health departments from 2010-2014. Total pay to health departments increased significantly by 123%, ranging from \$16.8M in 2010 to over \$37M in 2014. The increase in reimbursement could be explained by an increase in health departments contracting with health insurance companies and seeking reimbursement for services. NACCHO surveys over the last available years have indicated an increase in the number of health departments that reported billing health insurance for services (NACCHO, 2015). Although out of pocket costs also increased during this period, it was only by 11%. The proportion of total pay from the total achieved for health departments remained steady during the five-year period. However, 2012 was the highest for total pay (increase of 152% from 2010) and total out of pocket costs. This could be due to an increased number of health department clients now having access to health insurance because of the ACA. It could also be due to insurance companies that were included or excluded in the MarketScan® database during this time. The year 2012 also indicated the highest pay for services such as Family Planning. This could be due to the 2012 ACA requirement for all new health insurance plans to cover contraceptive services for women without cost sharing (Kaiser Family Foundation, 2018). The latest available Forces of Change Survey conducted by NACCHO, indicated that health

departments were serving a greater number of clients with health insurance in 2014 compared to 2013 (NACCHO, 2015). Individuals were choosing to come for services at the health department even though they were accessible to them with other providers in the community.

Regionally, there are differences in out of pocket costs. Individuals who lived in the Northeast paid more out of pocket for services across all five years (2010-2014) than individuals who lived in the South, West, and Midwest regions. It is not clear why this variation exists in this region of the country versus other regions. NACCHO surveys found that LHDs located in Medicaid expansion states served a higher percentage of patients with insurance compared to 29% of LHDs in states that chose not to expand Medicaid (NACCHO, 2015). NACCHO also found geographic variation in third-party billing. They found that six states reported billing both public and private payers for clinical services: Idaho, Nevada, Oklahoma, Oregon, South Dakota, and Virginia. Because not all LHDs have the infrastructure to bill private insurance for all services, patients may pay more out of pocket for services received. There was also variation across states when examining 2014, the last year of data include. For example, California had the largest population, based on census data, and brought in the most total pay (over \$12M). Texas, the second largest state, brought in a third of the amount while New Hampshire, a state with a small population, brought in approximately \$11M. States with larger populations did not indicate more total pay. The per capita income tells a different story from the population perspective. There is little correlation between per capita income and total pay. For example, the District of Columbia had the highest per capita income at \$60,000 but the lowest total pay for services at just over \$8,000 for 2014. Lastly, states that chose to expand Medicaid may have benefitted financially. In 2014, Medicaid expansion states had greater total pay (\$26M) compared to non-expansion states (\$12M).

Policy and research implications

The introduction of the ACA in 2010 and changes in the political landscape brought about many changes to the health care environment. Under the ACA, the number of uninsured Americans decreased from 44 million in 2013 to less than 28 million in 2016 (Kaiser Family Foundation, 2017). Although there have been gains in health insurance coverage and extension of Medicaid coverage to many low-income individuals, the future still holds much uncertainty with recent efforts to alter the ACA and future funding challenges.

As indicated, billing third party payers for services is not a new strategy for generating revenue to sustain local public health services. Billing was reported as early as 2001 when 31% of LHDs reported billing insurance for immunizations (Santoli, 2001). Although LHDs have billed health insurance, there is still much inconsistency, particularly with infrastructure to bill private insurance. One policy recommendation is to create a unified billing system at the state level with technical assistance for local health departments. In the recent past, funding has been available to support efforts such as this to bill for immunization and STI services. A larger effort, with a more comprehensive framework, could be applied to include all health department services which are considered billable and for which private health insurance could potentially reimburse. A 2015 NACCHO study indicated that LHDs with shared governance were more likely to report billing both public and private payers (NACCHO, 2015). The study indicates that LHDs in states with state-governed LHDs are better able to take a more unified approach and develop state-wide billing infrastructure compared to locally governed LHDs that may face challenges setting up contracts on their own.

Similarly, local policy support and a thorough exploration of potential barriers is critical to support billing practices. In a needs assessment conducted around billing for STI services, over 40% of respondents (n=213) reported that the primary reason they were not billing private

insurance was health department policy (Krasner, Kawatu & Eikner, 2014). This was followed by staffing issues, such as the need for additional trained staff to initiate billing or follow up on unpaid claims. Other barriers identified in the literature included the complexities associated with contracting, lengthy and cumbersome credentialing processes, and the local knowledge and funding needed to set up a billing system (CDC, 2012; NACCHO, 2015). Additionally, private health insurers may not have a full understanding of the LHD as a provider or fully grasp the breadth of services that LHDs provide to their clients. Removing barriers and building capacity for third party billing at the local level may be critical in determining how this source of monies can potentially contribute to local health department revenue streams.

Seeking reimbursement for public health services at the local level is important for numerous reasons, to include fiscal responsibility, stewardship, and sustainment of core public health functions. However, billing also raises some broader issues for consideration. The positive and negative consequences of pursuing billing for all services needs further exploration. In addition to serving as a safety net provider, local public health is responsible for the protecting, maintaining, and improving the health of a community. This includes serving as experts in communicable disease prevention and taking steps to ensure provision of services for communal benefit such as immunizations, STI/HIV, and tuberculosis. A county health director in Maricopa, Arizona used a historical timeline of developments that impacting immunization status in Arizona to demonstrate the need for consideration of challenges to herd immunity and other unintended consequences that may come with billing (England, 2015). STI services is one of the most recent areas for billing implementation. According to the CDC, STIs are at a record high with more than two million cases of chlamydia, gonorrhea, and syphilis reported in 2016 (CDC, 2017). This poses a growing threat to communities and calls to build better prevention

infrastructure and provide easy access to testing and treatment. Health department clients are comprised of a mix of individuals who have access to other community providers and those who do not. With services such as STI, HIV, and TB, elements such as easy access, expertise, trust, and privacy may be additional benefits to clients who seek these services. Considering these elements is important to the prevention of communicable disease.

Limitations

There were several limitations to this study. First, the data utilized for this study came from a large, existing commercial claims database. The Truven Health MarketScan® Research Database provides only summary data so details such as specific amounts submitted by health departments to private insurance are unknown. The claims database only provides information about reimbursement amounts and the portion of a bill that is the patient's responsibility. Agreements and contracts between health departments and private insurance companies differ, so exact charges for services and amounts submitted are also unknown. Based on the summary data available, assumptions can be made based on total amounts achieved. Additionally, the claims database only captures individuals who are 65 years of age and younger with private insurance. Therefore, anyone who falls outside of this age range and received health department services that could potentially be covered by private insurance would not be included. There are also limitations that are relevant to the use of secondary data sources. Data were not collected specifically for research purposes. As mentioned in the literature, one of the barriers to billing was inadequate training/knowledge at the local level. Inadequate training in procedure coding can lead to undercoding, overcoding, or miscoding for procedures. Data pulled from the database is only as accurate as the information that is collected and entered.

The second limitation is the use of provider code 750, used to draw the sample for this study, which may not be completely representative of local public health. This provider code is a self-designation used by those entities that consider themselves local public health facilities for billing purposes. The intent of this study was to examine the billing landscape for local public health. Because most services are provided by local health departments across the U.S., we can assume this provider code represents local public health. However, because the billing database does not distinguish among different health department levels, we cannot say with complete certainty that this only applies to local health department entities.

The third limitation comes with selection of CPT codes for analysis. Although efforts were made to ensure that the CPT code lists were comprehensive, some codes may have been missed or attributed erroneously to a service area. The period observed for this study was between the years of 2010-2014. Since CPT codes are updated annually, some of the codes may have changed – old codes removed or replaced, and new codes added.

Conclusion

While revenue from third-party billing may not be the end all solution to funding challenges and budget shortfalls in local public health, it is an area that needs to continue to be studied. Identifying areas where revenue can be collected can be part of a larger strategy to sustain billable clinical and preventive services. Because of current inconsistencies in the existing systems, there may be missed opportunities for revenue. While there are systems in place to support billing Medicaid, this is not necessarily the case with private insurance where there is greater variation and a lack of standardized systems. Examination of claims data over a five-year period in this study, in conjunction with earlier literature, points to a need for a more systematic approach to billing private health insurance at the local level. Further exploration of barriers to

billing, coding, and reimbursement, as well as an examination of local health department policies, culture, and staff attitudes, knowledge, and training needs assessment is needed.

In addition to billing, the research and discussion around billing should not be limited to ‘how do we bill’ but also ‘should we bill’ in the context of a larger ethical consideration to protect against erosion of the common good.

References

American Academy of Professional Coders (2017). CPT codes. Retrieved from <https://www.aapc.com/resources/medical-coding/cpt.aspx>

Association of State and Territorial Health Officials (2012). *State Public Health Agency Classification: Understanding the Relationship Between State and Local Public Health*. Arlington, Virginia.

Centers for Disease Control and Prevention (CDC) (2017). Funding Opportunity Announcement (FOA) PS12-1201: Comprehensive Human Immunodeficiency Virus (HIV) Prevention Programs for Health Departments. Retrieved from <https://www.cdc.gov/hiv/funding/announcements/ps12-1201/index.html>.

Centers for Disease Control and Prevention (CDC) Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention (2015). Improving sexually transmitted disease programs through assessment, assurance, policy development, and prevention strategies (STD AAPPS). Retrieved from <https://www.cdc.gov/std/foa/aapps/default.htm>.

Centers for Disease Control and Prevention (CDC). (2017). CDC Newsroom. STDs at record high, indicating urgent need for prevention. Retrieved April 7, 2018 from <https://www.cdc.gov/media/releases/2017/p0926-std-prevention.html>.

Coley, S., Iszler, R., Poirrier, V., Gates, S., NACCHO staff (2013, November 18). Becoming an in-network provider: The health department perspective [Webinar]. Retrieved from <http://archived.naccho.org/topics/HPDP/billing/upload/Final-BecomingAnInNetworkProviderNov192013.pdf>.

- Coley, S., Iszler, R., Poirrier, V., Gates, S., NACCHO staff (2013, November 18). Becoming an in-network provider: The health department perspective webinar Q and A [Webinar]. Retrieved from <http://archived.naccho.org/topics/HPDP/billing/upload/Final-BecomingAnInNetworkProviderNov192013.pdf>.
- England, B. (2015). Billing for public health services: Perfectly rational, and yet. *Journal of Public Health Management and Practice: JPHMP*, *21 Suppl 1*, S76-80.doi:10.1097/PHH.0000000000000137 [doi]
- Erwin, P. C., Shah, G. H., & Mays, G. P. (2014). Local health departments and the 2008 recession: Characteristics of resiliency. *American Journal of Preventive Medicine*, *46*(6), 559-568. doi:10.1016/j.amepre.2014.01.025 [doi]
- Etkind, P., Gehring, R., Ye, J., Kitlas, A., & Pestronk, R. (2014). Local health departments and billing for clinical services. *Journal of Public Health Management and Practice: JPHMP*, *20*(4), 456-458. doi:10.1097/PHH.0000000000000103 [doi]
- Hoover, K. W., Parsell, B. W., Leichter, J. S., Habel, M. A., Tao, G., Pearson, W. S., & Gift, T. L. (2015). Continuing need for sexually transmitted disease clinics after the Affordable Care Act. *American Journal of Public Health*, *105*(Suppl 5), S690–S695. <http://doi.org/10.2105/AJPH.2015.302839>
- Hsuan, C., & Rodriguez, H. P. (2014). The adoption and discontinuation of clinical services by local health departments. *American Journal of Public Health*, *104*(1), 124-133. doi:10.2105/AJPH.2013.301426 [doi]
- Hyde, J. K., & Shortell, S. M. (2012). The structure and organization of local and state public health agencies in the U.S.: A systematic review. *American Journal of Preventive Medicine*, *42*(5 Suppl 1), S29-41. doi:10.1016/j.amepre.2012.01.021 [doi]

Institute of Medicine. Committee for the Study of the Future of Public Health (1988). *The future of public health*. Washington, DC: The National Academies Press.

Institute of Medicine. *For the Public's Health: Investing in a Healthier Future* (2012). Washington, DC: Institute of Medicine.

Kaiser Family Foundation (2017). Key facts about the uninsured population. Retrieved April 11, 2018 from <https://www.kff.org/uninsured/fact-sheet/key-facts-about-the-uninsured-population/>.

Kaiser Family Foundation (2016). Laurie Sobel, Adara Beamesderfer & Alina Salganicoff. *Private insurance coverage of contraception*. Issue brief. Retrieved April 7, 2018 from <https://www.kff.org/womens-health-policy/issue-brief/private-insurance-coverage-of-contraception/>.

Kawatu, J., Krasner, A., Hamby, Y., Meersman, S.C., Higgins-Biddle, M., Lui, F., Hook, J., Tuchman, H. & Kaziunas, M. STD-related Reproductive Health Training and Technical Assistance Center, JSI Research & Training Institute (2014). Third-party billing for public health STD services: An executive summary of coordinated needs assessment results. Retrieved from <http://stdtac.org/wp-content/uploads/2016/05/Executive-Summary-Coordinated-Billing-Needs-Assessment-Feb-2014.pdf>.

Kilgus, D. (2011). Presentation. *Innovative Projects to improve reimbursement in public health department clinics*. Education Information and Partnership Branch, Immunization Services Division, National Center for Immunization and Respiratory Diseases.

Kilgus, C. D., & Redmon, G. S. (2014). Enabling reimbursement to health departments for immunization services. *Journal of Public Health Management and Practice: JPHMP*, 20(4), 453-455. doi:10.1097/PHH.0b013e3182a9dc03 [doi]

- Kovar, C.L., Carter, S., (2017). A survey of 25 North Carolina health departments/districts on knowledge, attitudes, and current practices to seeking reimbursement from third-party payers for sexually transmitted disease services. *Sexually Transmitted Diseases*, 44(6), 380-383.
- Krasner, A., Kawatu, J., & Eikner. (2014). Third party billing for public health STD services: A summary of needs assessment findings. Retrieved from <https://www.cdc.gov/std/training/third-party-webinar-slides-2-25-2014.pdf>
- Leep, C. J., & Shah, G. H. (2012). NACCHO's national profile of local health departments study: The premier source of data on local health departments for surveillance, research, and policymaking. *Journal of Public Health Management and Practice: JPHMP*, 18(2), 186-189. doi:10.1097/PHH.0b013e31824445ae [doi]
- Lindley, M. C. (2013). Billing practices of local health departments providing 2009 pandemic influenza A (H1N1) vaccine. *Journal of Public Health Management and Practice: JPHMP*, 19(3), 220-223. doi:10.1097/PHH.0b013e31825874c3 [doi]
- Lindley, M. C., Shen, A. K., Orenstein, W. A., Rodewald, L. E., & Birkhead, G. S. (2009). Financing the delivery of vaccines to children and adolescents: Challenges to the current system. *Pediatrics*, 124 Suppl 5, S548-57. doi:10.1542/peds.2009-1542O [doi]
- McCullough, J. M. (2016). Timing of clinical billing reimbursement for a local health department. *Public Health Reports (Washington, D.C.: 1974)*, 131(2), 283-289.
- National Association of County & City Health Officials (NACCHO) (2005). Operational definition of a functional local health department. Retrieved from <http://archivednaccho.org/topics/infrastructure/accreditation/OpDef.cfm>.

- National Association of County & City Health Officials (NACCHO) (2014). Research brief: Billing for clinical services: Findings from the 2014 Forces of Change survey. Retrieved June 5, 2016 from <http://archived.naccho.org/topics/research/forcesofchange/upload/Billing.pdf>.
- National Association of County and City Health Officials (NACCHO) (2015). *The changing public health landscape*. Findings from the 2015 Forces of Change survey. Retrieved June 8, 2016 from <http://nacchoprofilestudy.org/forces-of-change/>.
- National Association of County and City Health Officials (NACCHO): 2008 Profile of Local Health Departments. July 2009. Retrieved January 8, 2017 from http://www.naccho.org/topics/infrastructure/profile/resources/2008report/upload/NACCHO_2008_Profile_Report_post-to-website-2.pdf.
- National Coalition of STD Directors (2016). Setting the stage: Policy and funding landscape impacting third-party billing for STD-related services. Retrieved from http://www.ncsddc.org/sites/default/files/media/policy_standalone.pdf
- Newman, S. J., & Leep, C. J. (2014). Local health department billing for clinical services: Findings from the 2014 forces of change survey. *Journal of Public Health Management and Practice: JPHMP*, 20(6), 672-675. doi:10.1097/PHH.0000000000000144 [doi]
- Pearson, W. S., Cramer, R., Tao, G., Leichter, J. S., Gift, T. L., & Hoover, K. W. (2016). Willingness to use health insurance at a sexually transmitted disease clinic: A survey of patients at 21 US clinics. *American Journal of Public Health*, 106(8), 1511-1513. doi:<http://dx.doi.org.ezproxy-v.musc.edu/10.2105/AJPH.2016.303263>
- Public Health Functions Steering Committee (1995). Members: American Public Health Association, Association of Schools of Public Health, Association of State and Territorial

Health Officials, Environmental Council of the States, National Association of County and City Health Officials, National Association of State Alcohol and Drug Abuse Directors, National Association of State Mental Health Program Directors, Public Health Foundation, U.S. Public Health Service --*Agency for Health Care Policy and Research, Centers for Disease Control and Prevention, Food and Drug Administration, Health Resources and Services Administration, Indian Health Service, National Institutes of Health, Office of the Assistant Secretary for Health, Substance Abuse and Mental Health Services Administration*, Adopted: Fall 1994, Source: Public Health Functions Steering Committee, Members (July 1995)

Quintanilla, C., Duncan, L., & Luther, L. (2009). Billing third party payers for vaccines: State and local health department perspectives. *Journal of Public Health Management and Practice: JPHMP*, 15(5), E1-5. doi:10.1097/PHH.0b013e3181a23dd5 [doi]

Santoli, J. M., Barker, L. E., Lyons, B. H., Gandhi, N. B., Phillips, C., & Rodewald, L. E. (2001). Health department clinics as pediatric immunization providers: A national survey. *American Journal of Preventive Medicine*, 20(4), 266-271. doi:S0749379701002999 [pii]

State Science and Technology and Technology Institute. (2016). Useful stats: Per capita personal income by state, 2010-2015. Retrieved April 10, 2018 from <https://ssti.org/blog/useful-stats-capita-personal-income-state-2010-2015>.

STD Technical Assistance Center (2017). STD Billing and Reimbursement Toolkit. Retrieved January 8, 2016 from www.stdtac.org.

Shah, G. H., Ye, J., Leep, C. J., & Leider, J. P. (2016). Local health departments' approaches to deal with recession: What strategies are used to minimize the negative impact on public

health services to community? *Journal of Public Health Management and Practice: JPHMP*, 22(6), 537-541. doi:10.1097/PHH.0000000000000260 [doi]

Truven Health MarketScan® Research Databases. (2014). Commercial claims and encounters. Medicare Supplemental. Data year 2014 edition.

U.S. Department of Health and Human Services (2013). The Affordable Care Act – About the Law. Retrieved from <http://www.hhs.gov/healthcare/about-the-law>.

Washburn, K., Goodwin, C., Preeti, P. & Blank, S. (2014). Insurance and billing concerns among patients seeking free and confidential sexually transmitted disease care: New York City sexually transmitted disease clinics 2012. *Sexually Transmitted Diseases* 41(7), 463-466.

Willard, R., Shah, G. H., Leep, C., & Ku, L. (2012). Impact of the 2008-2010 economic recession on local health departments. *Journal of Public Health Management and Practice: JPHMP*, 18(2), 106-114. doi:10.1097/PHH.0b013e3182461cf2 [doi]

APPENDIX A

LIST OF CPT CODES

*Services programming codes in SAS***;

```
Data c.Ostafin;
set c.MarkerScan;**All outpatient data***;

HepC=0;* Hepatitis C screening**;
If CPT in: ('G0472') then HepC=1;

HIVSc=0;**HIV screening codes**;
If CPT in: ('80081', 'G0432', 'G0433', 'G0435', 'G0475') then HIVSc=1;

HepBVac=0;*Hepatitis B vaccine codes*;
If CPT in: ('90739', '90740', '90743', '90744', '90746', '90747',
'G0010') then HepBVac=1;

FluVac=0;**Flu vaccine codes**;
If CPT in: ('90630', '90653', '90654', '90655', '90656', '90657',
'90660', '90661', '90662', '90672', '90673', '90674', '90685',
'90686', '90687', '90688', 'Q2035', 'Q2036', 'Q2038', 'Q2039') then
FluVac=1;

PneuVac=0;
If CPT in: ('90670', '90732', 'G0009') then PneuVac=1;

STI=0; *STI codes*;
If CPT in: ('99201', '99202', '99203', '99204', '99205', '99211',
'99212', '99213', '99214', '99215', '56501', '56515', '54050',
'54065', '99000', '36415', '36416', 'L8847', 'L188052', 'L8128',
'L182537', 'L3004', 'L1370', 'PREP', 'L164905', 'L163147', 'L188698',
'L188672', 'L219949', 'L144045', 'L82345', 'Q0111', 'L182526',
'L183194', '86593', '86703', '87210', '81000', '87086', '81025',
'86631', '86632', '87110', '87270', '87320', '87490', '87491',
'87492', '87801', '87810', '87590', '87591', '87592', '87801',
'87850', '86689', '86701', 'L8250', 'L83935', '86592', '86593',
'99401', '99402', '99403', '99404', '90649', '90650', '90460',
'90461', '90471', '90472', '87620', '87621', '87622', '90632',
'90633', '90636', '90460', '90461', '90740', '90744', '90746',
'90747') then STI=1;

TB=0; *TB codes*;
If CPT in: ('99211', '99203', 'L368878', 'L303744', 'L315874',
'85025', 'LDSTI', '81025', '83036', '94664', 'EDCNSC', 'ASFAM',
'MDCR', '99341', '71010', '71020', '71021', 'CXRR', 'BP', '92081',
'92551', 'WT', 'J8499', 'RD261', 'RD574A', 'TBDOT', 'TBDOPT', 'BEGTH',
```

```

MATY=0; *MATY codes*;
If CPT in ('MADM1', 'MADM2', 'MADM3', 'NEW2ARL', '99203', '99213',
'BRFV', '86023', 'L322758', 'L322000', 'L1453', 'L322755', 'L140659',
'L10330', 'L3004', 'L3277', 'L4259', 'L27011', 'L42077', 'L186072',
'L164806', 'L164905', '86644', '86645', '86777', '86778', 'L163303',
'L794388', '76815', '76805', '96372', '36416', '36415', '85018',
'85025', '83020', '87077', '87801', 'L83935', '86593', '86592',
'87210', '81001', '87086', '81025', 'L17319', '86901', '82950',
'82951', '82952', '87081', 'L315892', '86762', 'L96206', 'L193025',
'L507301', 'L507460', 'ZIKALAB', 'REFSONO', REFSONO2', 'REFAMNI',
'CRAMINO', 'NUTAS', '96160', 'MVC', '90746', '86580', 'RHOGAM',
'90715', '90686', '90688', '90636', 'PPDREAD') then MATY=1;

```

```

FAMPLAN=0; *FAMPLAN codes*;
If CPT in ('99205', '99213', '99214', '99215', '36416', '36415',
'85018', '85025', '83020', '87077', '87801', '86703', '86593',
'86592', '87210', '81001', '87086', '81025', 'PRGNA',
'PRGPA', 'L193025', 'L507301', 'L507460', 'L186072', 'L164806',
'L164905', 'R551a', '11981', '11982', '11983', '58300', '58301',
'57170', 'LDBEADS', 'LARCER', '82947', '82950', '90651', '90707',
'99201', '99202', '99203', '99204', '99401', '99402', '11976',
'57170', 'A4266', 'A4267', 'A4268', 'A4269', 'J1050', 'J7300',
'J7302', 'J7303', 'J7304', 'J7307', 'S4993', 'J3490', 'J0696',
'Q0144', '81000', '82948', '85013', '85018', '86701', 'Q0111',
'99000', '00921', '54050', '54056', '55250', '90746', '90715',
'90716', '90686', '90688', '99384', '99394', '99385', '99395',
'99386', '99396', '99211', '99212', '99213', 'BRFV', 'FPABST',
'FPMCON', 'FPFJCS', 'FPDIACC', 'FPDEPO', 'FPPRG', 'FPORA', 'FPUNK',
'FPTUBAL', 'FPIUD', 'FPIMPL', 'FPIUS', 'FPNUVA', 'FPNAT', 'FP NONE',
'FPPATCH', 'FPRFM', 'FPLAM', 'FPOTHR', 'MVC', 'FAC', 'LDMAMM',
'LDPPDA') then FAMPLAN=1;

```

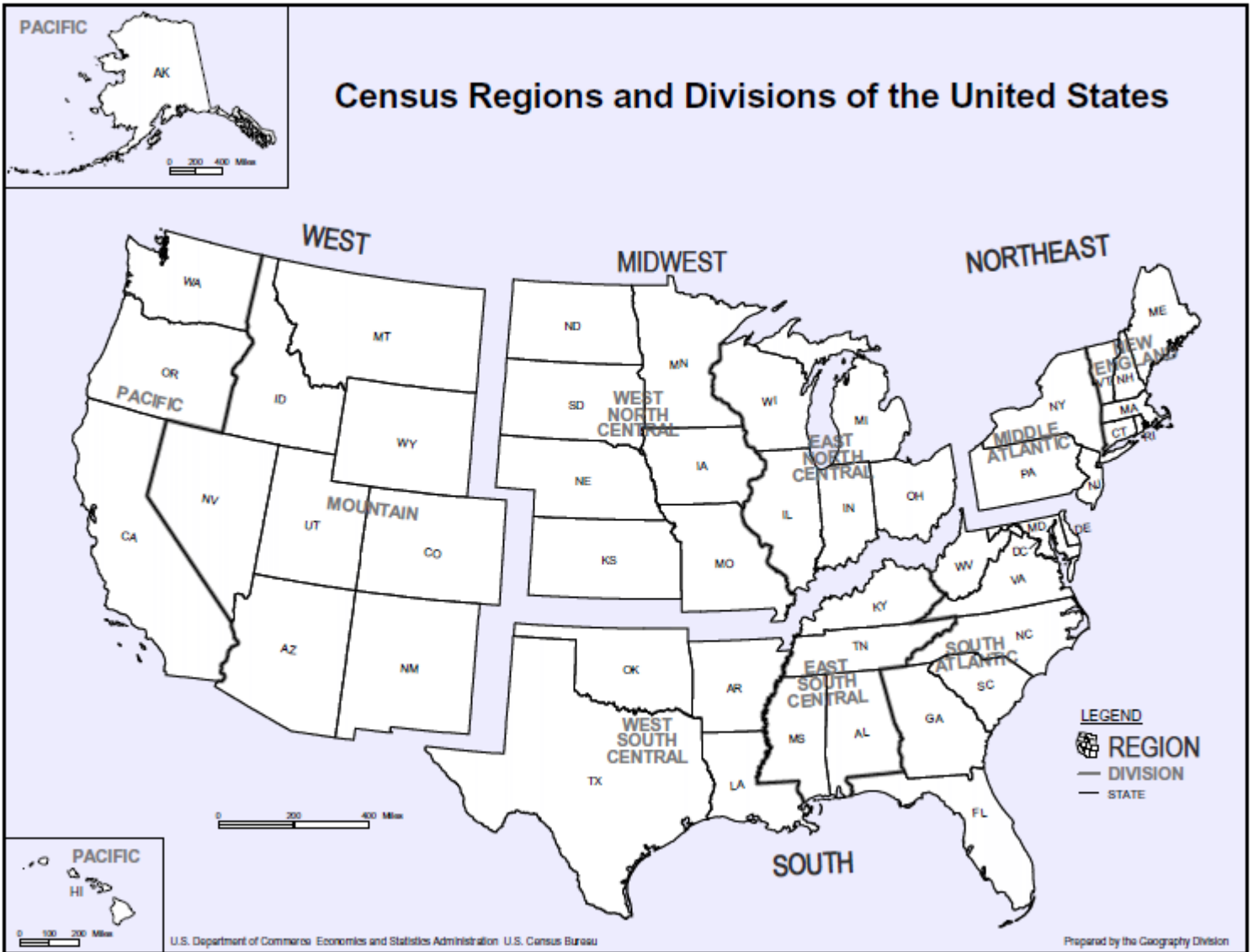
```

IMMUN=0; *IMMUN codes*;
If CPT in ('90396', '90476', '90477', '90581', '90585', '90632',
'90633', '90634', '90636', '90645', '90646', '90647', '90648',
'90649', '90650', '90655', '90656', '90657', '90658', '90281',
'90283', '90287', '90291', '90296', '90371', '90375', '90376',
'90378', '90379', '90389', '90393', '90659', '90660', '90665',
'90669', '90670', '90675', '90676', '90680', '90681', '90690',
'90691', '90692', '90693', '90696', '90698', '90700', '90701',
'90702', '90703', '90704', '90705', '90706', '90707', '90708',
'90710', '90712', '90713', '90714', '90715', '90716', '90717',
'90718', '90720', '90721', '90723', '90724', '90725', '90726',
'90727', '90728', '90730', '90731', '90732', '90733', '90734',
'90735', '90736', '90737', '90738', '90740', '90741', '90743',
'90744', '90745', '90746', '90747', '90748', '90662', '90663',
'90664', '90668', '90470', '90666', '90654', '90685', '90686',
'90688', '90661', '90673', '90687', '90621', '90620', '90739',
'90653', '90674', '90625', '90697', '90682', '90630', '90644',
'90651', '90672', '86580', 'TBSCREEN') then IMMUNI=1;

```

APPENDIX B

CENSUS BUREAU MAP

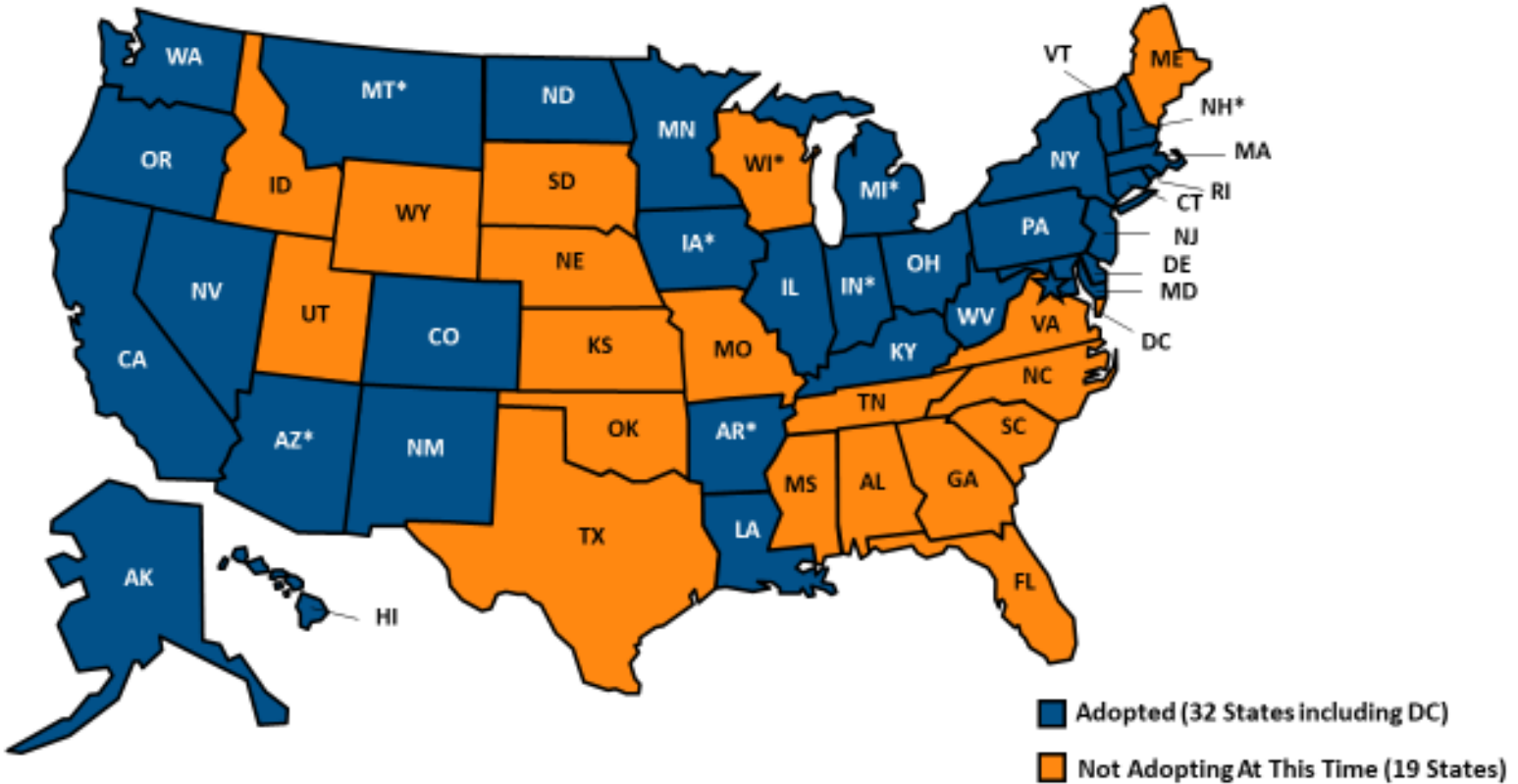


https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

APPENDIX C

MEDICAID EXPANSION MAP

Current Status of State Medicaid Expansion Decisions



NOTES: Current status for each state is based on KCMU tracking and analysis of state executive activity. *AR, AZ, IA, IN, MI, MT, and NH have approved Section 1115 waivers. WI covers adults up to 100% FPL in Medicaid, but did not adopt the ACA expansion.
SOURCE: "Status of State Action on the Medicaid Expansion Decision," KFF State Health Facts, updated January 1, 2017.
<http://kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/>



APPENDIX D

SAS SUMMARY DATA

Total number of records in Public Health Department Data set 18
 14:12 Saturday, October 21, 2017

The FREQ Procedure

| Type | Frequency | Cumulative Percent | Cumulative Frequency | Cumulative Percent |
|---------|-----------|--------------------|----------------------|--------------------|
| FamPlan | 352729 | 18.68 | 352729 | 18.68 |
| FluVac | 2796 | 0.15 | 355525 | 18.83 |
| HBVac | 10 | 0.00 | 355535 | 18.83 |
| HIVSc | 3 | 0.00 | 355538 | 18.83 |
| Imun | 291336 | 15.43 | 646874 | 34.26 |
| Maty | 9049 | 0.48 | 655923 | 34.74 |
| Other | 936642 | 49.61 | 1592565 | 84.34 |
| PNEVac | 709 | 0.04 | 1593274 | 84.38 |
| STI | 282286 | 14.95 | 1875560 | 99.33 |
| TB | 12637 | 0.67 | 1888197 | 100.00 |

Total number of records in Per Year in Public Health Department Data set 19
 14:12 Saturday, October 21, 2017

The FREQ Procedure

Table of Type by YEAR

| Type | YEAR(Date Year Incurred) | | | | | | |
|------------|--------------------------|-------|--------|-------|-------|--------|--|
| Frequency, | | | | | | | |
| Percent , | | | | | | | |
| Row Pct , | | | | | | | |
| Col Pct , | 2010, | 2011, | 2012, | 2013, | 2014, | Total | |
| FamPlan | 31346 | 50293 | 136850 | 41449 | 92791 | 352729 | |
| | 1.66 | 2.66 | 7.25 | 2.20 | 4.91 | 18.68 | |
| | 8.89 | 14.26 | 38.80 | 11.75 | 26.31 | | |
| | 10.96 | 14.05 | 24.56 | 15.25 | 22.34 | | |
| FluVac | 2 | 545 | 1448 | 217 | 584 | 2796 | |
| | 0.00 | 0.03 | 0.08 | 0.01 | 0.03 | 0.15 | |
| | 0.07 | 19.49 | 51.79 | 7.76 | 20.89 | | |
| | 0.00 | 0.15 | 0.26 | 0.08 | 0.14 | | |
| HBVac | 2 | 1 | 1 | 1 | 5 | 10 | |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| | 20.00 | 10.00 | 10.00 | 10.00 | 50.00 | | |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| HIVSc | 0 | 0 | 1 | 2 | 0 | 3 | |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| | 0.00 | 0.00 | 33.33 | 66.67 | 0.00 | | |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Imun | 43528 | 59911 | 81555 | 45082 | 61260 | 291336 | |
| | 2.31 | 3.17 | 4.32 | 2.39 | 3.24 | 15.43 | |
| | 14.94 | 20.56 | 27.99 | 15.47 | 21.03 | | |
| | 15.22 | 16.73 | 14.64 | 16.58 | 14.75 | | |
| Maty | 844 | 1479 | 3615 | 1362 | 1749 | 9049 | |

```

, 0.04, 0.08, 0.19, 0.07, 0.09, 0.48
, 9.33, 16.34, 39.95, 15.05, 19.33,
, 0.30, 0.41, 0.65, 0.50, 0.42,
#####
Other , 181848, 190933, 250118, 140146, 173597, 936642
, 9.63, 10.11, 13.25, 7.42, 9.19, 49.61
, 19.41, 20.38, 26.70, 14.96, 18.53,
, 63.60, 53.33, 44.90, 51.55, 41.80,
#####
PNEVac , 6, 13, 645, 29, 16, 709
, 0.00, 0.00, 0.03, 0.00, 0.00, 0.04
, 0.85, 1.83, 90.97, 4.09, 2.26,
, 0.00, 0.00, 0.12, 0.01, 0.00,
#####
STI , 26993, 51913, 77783, 42195, 83402, 282286
, 1.43, 2.75, 4.12, 2.23, 4.42, 14.95
, 9.56, 18.39, 27.55, 14.95, 29.55,
, 9.44, 14.50, 13.96, 15.52, 20.08,
#####
TB , 1337, 2935, 5094, 1391, 1880, 12637
, 0.07, 0.16, 0.27, 0.07, 0.10, 0.67
, 10.58, 23.23, 40.31, 11.01, 14.88,
, 0.47, 0.82, 0.91, 0.51, 0.45,
#####
Total 285906 358023 557110 271874 415284 1888197
15.14 18.96 29.50 14.40 21.99 100.00

```

Total number of records in Public Health Department Data set by State
14:12 Saturday, October 21, 2017

20

The FREQ Procedure

Table of ST by Type

| ST | Type | Frequency, | Percent , | Row Pct , | Col Pct , | FamPlan | FluVac | HBVac | HIVSc | Imun | Maty | Other | PNEVac | STI | TB | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|------|------------|-----------|-----------|-----------|---------|--------|--------|-------|------|------|--------|--------|------|------|-------|------|------|------|------|------|------|-------|-------|------|-------|------|-------|-------|-------|-------|-------|------|------|-------|------|------|--------|------|-------|-------|------|------|-------|------|
| Alab | | 3255 | 5 | 0 | 0 | 3643 | 117 | 8045 | 0 | 476 | 338 | 15879 | 0.17 | 0.00 | 0.00 | 0.00 | 0.19 | 0.01 | 0.43 | 0.00 | 0.03 | 0.02 | 0.84 | 20.50 | 0.03 | 0.00 | 0.00 | 22.94 | 0.74 | 50.66 | 0.00 | 3.00 | 2.13 | 0.92 | 0.18 | 0.00 | 0.00 | 1.25 | 1.29 | 0.86 | 0.00 | 0.17 | 2.67 | | |
| Alas | | 39 | 0 | 0 | 0 | 47 | 1 | 226 | 0 | 17 | 12 | 342 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.74 | 0.29 | 66.08 | 0.00 | 4.97 | 3.51 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.02 | 0.00 | 0.01 | 0.09 | |
| Ariz | | 1175 | 267 | 0 | 0 | 1606 | 35 | 4455 | 0 | 788 | 65 | 8391 | 0.06 | 0.01 | 0.00 | 0.00 | 0.09 | 0.00 | 0.24 | 0.00 | 0.04 | 0.00 | 0.04 | 0.00 | 0.44 | 14.00 | 3.18 | 0.00 | 0.00 | 19.14 | 0.42 | 53.09 | 0.00 | 9.39 | 0.77 | 0.33 | 9.55 | 0.00 | 0.00 | 0.55 | 0.39 | 0.48 | 0.00 | 0.28 | 0.51 |
| Arka | | 344 | 1 | 0 | 0 | 524 | 13 | 666 | 7 | 140 | 2 | 1697 | 0.02 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.04 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.09 | 20.27 | 0.06 | 0.00 | 0.00 | 30.88 | 0.77 | 39.25 | 0.41 | 8.25 | 0.12 | 0.10 | 0.04 | 0.00 | 0.18 | 0.14 | 0.07 | 0.99 | 0.05 | 0.02 | |
| Cali | | 64080 | 14 | 0 | 3 | 9578 | 1949 | 124559 | 1 | 8342 | 3650 | 212176 | 3.39 | 0.00 | 0.00 | 0.00 | 0.51 | 0.10 | 6.60 | 0.00 | 0.44 | 0.19 | 11.24 | 30.20 | 0.01 | 0.00 | 0.00 | 0.00 | 4.51 | 0.92 | 58.71 | 0.00 | 3.93 | 1.72 | 18.17 | 0.50 | 0.00 | 100.00 | 3.29 | 21.54 | 13.30 | 0.14 | 2.96 | 28.88 | |

| | | | | | | | | | | | |
|-------|----------|--------|--------|-------|--------|-------|--------|-------|--------|-------|---------|
| Colo | , 1569, | 30, | 0, | 0, | 2522, | 26, | 2209, | 1, | 2194, | 29, | 8580 |
| | , 0.08, | 0.00, | 0.00, | 0.00, | 0.13, | 0.00, | 0.12, | 0.00, | 0.12, | 0.00, | 0.45 |
| | , 18.29, | 0.35, | 0.00, | 0.00, | 29.39, | 0.30, | 25.75, | 0.01, | 25.57, | 0.34, | |
| | , 0.44, | 1.07, | 0.00, | 0.00, | 0.87, | 0.29, | 0.24, | 0.14, | 0.78, | 0.23, | |
| Conn | , 18131, | 477, | 0, | 0, | 2600, | 328, | 51510, | 3, | 4634, | 1127, | 78810 |
| | , 0.96, | 0.03, | 0.00, | 0.00, | 0.14, | 0.02, | 2.73, | 0.00, | 0.25, | 0.06, | 4.17 |
| | , 23.01, | 0.61, | 0.00, | 0.00, | 3.30, | 0.42, | 65.36, | 0.00, | 5.88, | 1.43, | |
| | , 5.14, | 17.06, | 0.00, | 0.00, | 0.89, | 3.62, | 5.50, | 0.42, | 1.64, | 8.92, | |
| Dela | , 15, | 0, | 0, | 0, | 11, | 0, | 207, | 0, | 13, | 2, | 248 |
| | , 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.01, | 0.00, | 0.00, | 0.00, | 0.01 |
| | , 6.05, | 0.00, | 0.00, | 0.00, | 4.44, | 0.00, | 83.47, | 0.00, | 5.24, | 0.81, | |
| | , 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.02, | 0.00, | 0.00, | 0.02, | |
| Flor | , 996, | 2, | 1, | 0, | 751, | 10, | 6419, | 0, | 403, | 12, | 8594 |
| | , 0.05, | 0.00, | 0.00, | 0.00, | 0.04, | 0.00, | 0.34, | 0.00, | 0.02, | 0.00, | 0.46 |
| | , 11.59, | 0.02, | 0.01, | 0.00, | 8.74, | 0.12, | 74.69, | 0.00, | 4.69, | 0.14, | |
| | , 0.28, | 0.07, | 10.00, | 0.00, | 0.26, | 0.11, | 0.69, | 0.00, | 0.14, | 0.09, | |
| Total | 352729 | 2796 | 10 | 3 | 291336 | 9049 | 936642 | 709 | 282286 | 12637 | 1888197 |
| | 18.68 | 0.15 | 0.00 | 0.00 | 15.43 | 0.48 | 49.61 | 0.04 | 14.95 | 0.67 | 100.00 |

(Continued)

Total number of records in Public Health Department Data set by State
14:12 Saturday, October 21, 2017

21

The FREQ Procedure

Table of ST by Type

ST Type

Frequency,

Percent ,

Row Pct ,

Col Pct ,FamPlan ,FluVac ,HBVac ,HIVSc ,Imun ,Maty ,Other ,PNEVac ,STI ,TB , Total

| | | | | | | | | | | | |
|------|----------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|
| Geor | , 31965, | 80, | 2, | 0, | 35687, | 62, | 14824, | 4, | 54915, | 27, | 137566 |
| | , 1.69, | 0.00, | 0.00, | 0.00, | 1.89, | 0.00, | 0.79, | 0.00, | 2.91, | 0.00, | 7.29 |
| | , 23.24, | 0.06, | 0.00, | 0.00, | 25.94, | 0.05, | 10.78, | 0.00, | 39.92, | 0.02, | |
| | , 9.06, | 2.86, | 20.00, | 0.00, | 12.25, | 0.69, | 1.58, | 0.56, | 19.45, | 0.21, | |

| | | | | | | | | | | | |
|------|----------|-------|-------|-------|-------|-------|--------|-------|-------|-------|------|
| Hawa | , 11, | 0, | 0, | 0, | 3, | 0, | 20, | 0, | 3, | 0, | 37 |
| | , 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00 |
| | , 29.73, | 0.00, | 0.00, | 0.00, | 8.11, | 0.00, | 54.05, | 0.00, | 8.11, | 0.00, | |
| | , 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | 0.00, | |

| | | | | | | | | | | | |
|------|----------|-------|-------|-------|--------|-------|-------|-------|--------|-------|-------|
| Idah | , 11686, | 17, | 0, | 0, | 10037, | 56, | 4243, | 22, | 25899, | 19, | 51979 |
| | , 0.62, | 0.00, | 0.00, | 0.00, | 0.53, | 0.00, | 0.22, | 0.00, | 1.37, | 0.00, | 2.75 |
| | , 22.48, | 0.03, | 0.00, | 0.00, | 19.31, | 0.11, | 8.16, | 0.04, | 49.83, | 0.04, | |
| | , 3.31, | 0.61, | 0.00, | 0.00, | 3.45, | 0.62, | 0.45, | 3.10, | 9.17, | 0.15, | |

| | | | | | | | | | | | |
|------|----------|--------|--------|-------|-------|--------|--------|-------|-------|--------|--------|
| Illi | , 80265, | 1272, | 1, | 0, | 5324, | 1567, | 68036, | 4, | 4741, | 2340, | 163550 |
| | , 4.25, | 0.07, | 0.00, | 0.00, | 0.28, | 0.08, | 3.60, | 0.00, | 0.25, | 0.12, | 8.66 |
| | , 49.08, | 0.78, | 0.00, | 0.00, | 3.26, | 0.96, | 41.60, | 0.00, | 2.90, | 1.43, | |
| | , 22.76, | 45.49, | 10.00, | 0.00, | 1.83, | 17.32, | 7.26, | 0.56, | 1.68, | 18.52, | |

| | | | | | | | | | | | |
|------|----------|-------|-------|-------|--------|-------|--------|-------|-------|-------|-------|
| Indi | , 2122, | 1, | 0, | 0, | 5635, | 12, | 4174, | 0, | 101, | 29, | 12074 |
| | , 0.11, | 0.00, | 0.00, | 0.00, | 0.30, | 0.00, | 0.22, | 0.00, | 0.01, | 0.00, | 0.64 |
| | , 17.57, | 0.01, | 0.00, | 0.00, | 46.67, | 0.10, | 34.57, | 0.00, | 0.84, | 0.24, | |
| | , 0.60, | 0.04, | 0.00, | 0.00, | 1.93, | 0.13, | 0.45, | 0.00, | 0.04, | 0.23, | |

| | | | | | | | | | | | |
|------|---------|-------|-------|-------|--------|-------|--------|-------|--------|-------|------|
| Iowa | , 342, | 100, | 0, | 0, | 1118, | 6, | 1165, | 0, | 864, | 6, | 3601 |
| | , 0.02, | 0.01, | 0.00, | 0.00, | 0.06, | 0.00, | 0.06, | 0.00, | 0.05, | 0.00, | 0.19 |
| | , 9.50, | 2.78, | 0.00, | 0.00, | 31.05, | 0.17, | 32.35, | 0.00, | 23.99, | 0.17, | |


```

, 0.10, 3.58, 0.00, 0.00, 0.38, 0.07, 0.12, 0.00, 0.31, 0.05,
#####
Kans , 3692, 129, 0, 0, 4177, 105, 9365, 0, 13620, 584, 31672
, 0.20, 0.01, 0.00, 0.00, 0.22, 0.01, 0.50, 0.00, 0.72, 0.03, 1.68
, 11.66, 0.41, 0.00, 0.00, 13.19, 0.33, 29.57, 0.00, 43.00, 1.84,
, 1.05, 4.61, 0.00, 0.00, 1.43, 1.16, 1.00, 0.00, 4.82, 4.62,
#####
Kent , 256, 0, 0, 0, 120, 17, 881, 0, 70, 6, 1350
, 0.01, 0.00, 0.00, 0.00, 0.01, 0.00, 0.05, 0.00, 0.00, 0.00, 0.07
, 18.96, 0.00, 0.00, 0.00, 8.89, 1.26, 65.26, 0.00, 5.19, 0.44,
, 0.07, 0.00, 0.00, 0.00, 0.04, 0.19, 0.09, 0.00, 0.02, 0.05,
#####
Loui , 1973, 0, 0, 0, 428, 97, 1750, 1, 406, 12, 4667
, 0.10, 0.00, 0.00, 0.00, 0.02, 0.01, 0.09, 0.00, 0.02, 0.00, 0.25
, 42.28, 0.00, 0.00, 0.00, 9.17, 2.08, 37.50, 0.02, 8.70, 0.26,
, 0.56, 0.00, 0.00, 0.00, 0.15, 1.07, 0.19, 0.14, 0.14, 0.09,
#####
Total 352729 2796 10 3 291336 9049 936642 709 282286 12637 1888197
18.68 0.15 0.00 0.00 15.43 0.48 49.61 0.04 14.95 0.67 100.00
(Continued)

```

Total number of records in Public Health Department Data set by State 22
14:12 Saturday, October 21, 2017

The FREQ Procedure

Table of ST by Type

```

ST   Type
Frequency,
Percent ,
Row Pct ,
Col Pct ,FamPlan,FluVac ,HBVac ,HIVSc ,Imun ,Maty ,Other ,PNEVac ,STI ,TB , Total
#####
Main , 1792, 0, 0, 0, 120, 28, 3471, 0, 42, 7, 5460
, 0.09, 0.00, 0.00, 0.00, 0.01, 0.00, 0.18, 0.00, 0.00, 0.00, 0.29
, 32.82, 0.00, 0.00, 0.00, 2.20, 0.51, 63.57, 0.00, 0.77, 0.13,
, 0.51, 0.00, 0.00, 0.00, 0.04, 0.31, 0.37, 0.00, 0.01, 0.06,
#####
Mary , 713, 0, 0, 0, 245, 32, 3623, 0, 176, 163, 4952
, 0.04, 0.00, 0.00, 0.00, 0.01, 0.00, 0.19, 0.00, 0.01, 0.01, 0.26
, 14.40, 0.00, 0.00, 0.00, 4.95, 0.65, 73.16, 0.00, 3.55, 3.29,
, 0.20, 0.00, 0.00, 0.00, 0.08, 0.35, 0.39, 0.00, 0.06, 1.29,
#####
Mass , 2429, 8, 0, 0, 569, 31, 7792, 0, 478, 98, 11405
, 0.13, 0.00, 0.00, 0.00, 0.03, 0.00, 0.41, 0.00, 0.03, 0.01, 0.60
, 21.30, 0.07, 0.00, 0.00, 4.99, 0.27, 68.32, 0.00, 4.19, 0.86,
, 0.69, 0.29, 0.00, 0.00, 0.20, 0.34, 0.83, 0.00, 0.17, 0.78,
#####
Mich , 4274, 7, 2, 0, 1326, 46, 16334, 0, 1083, 47, 23119
, 0.23, 0.00, 0.00, 0.00, 0.07, 0.00, 0.87, 0.00, 0.06, 0.00, 1.22
, 18.49, 0.03, 0.01, 0.00, 5.74, 0.20, 70.65, 0.00, 4.68, 0.20,
, 1.21, 0.25, 20.00, 0.00, 0.46, 0.51, 1.74, 0.00, 0.38, 0.37,
#####
Minn , 1716, 9, 0, 0, 1788, 228, 15237, 1, 582, 1029, 20590
, 0.09, 0.00, 0.00, 0.00, 0.09, 0.01, 0.81, 0.00, 0.03, 0.05, 1.09
, 8.33, 0.04, 0.00, 0.00, 8.68, 1.11, 74.00, 0.00, 2.83, 5.00,
, 0.49, 0.32, 0.00, 0.00, 0.61, 2.52, 1.63, 0.14, 0.21, 8.14,
#####
Miso , 622, 14, 0, 0, 2540, 11, 6872, 2, 925, 13, 10999
, 0.03, 0.00, 0.00, 0.00, 0.13, 0.00, 0.36, 0.00, 0.05, 0.00, 0.58
, 5.66, 0.13, 0.00, 0.00, 23.09, 0.10, 62.48, 0.02, 8.41, 0.12,
, 0.18, 0.50, 0.00, 0.00, 0.87, 0.12, 0.73, 0.28, 0.33, 0.10,
#####
Miss , 5085, 6, 2, 0, 3242, 24, 2609, 13, 2111, 8, 13100

```

| | |
|-------|--|
| | , 0.27, 0.00, 0.00, 0.00, 0.17, 0.00, 0.14, 0.00, 0.11, 0.00, 0.69 |
| | , 38.82, 0.05, 0.02, 0.00, 24.75, 0.18, 19.92, 0.10, 16.11, 0.06, |
| | , 1.44, 0.21, 20.00, 0.00, 1.11, 0.27, 0.28, 1.83, 0.75, 0.06, |
| Mont | , 16909, 106, 0, 0, 40654, 420, 19621, 7, 36594, 730, 115041 |
| | , 0.90, 0.01, 0.00, 0.00, 2.15, 0.02, 1.04, 0.00, 1.94, 0.04, 6.09 |
| | , 14.70, 0.09, 0.00, 0.00, 35.34, 0.37, 17.06, 0.01, 31.81, 0.63, |
| | , 4.79, 3.79, 0.00, 0.00, 13.95, 4.64, 2.09, 0.99, 12.96, 5.78, |
| NCar | , 6430, 22, 0, 0, 14467, 100, 4658, 3, 17128, 48, 42856 |
| | , 0.34, 0.00, 0.00, 0.00, 0.77, 0.01, 0.25, 0.00, 0.91, 0.00, 2.27 |
| | , 15.00, 0.05, 0.00, 0.00, 33.76, 0.23, 10.87, 0.01, 39.97, 0.11, |
| | , 1.82, 0.79, 0.00, 0.00, 4.97, 1.11, 0.50, 0.42, 6.07, 0.38, |
| Total | 352729 2796 10 3 291336 9049 936642 709 282286 12637 1888197 |
| | 18.68 0.15 0.00 0.00 15.43 0.48 49.61 0.04 14.95 0.67 100.00 |

(Continued)

Total number of records in Public Health Department Data set by State 23
 14:12 Saturday, October 21, 2017

The FREQ Procedure

Table of ST by Type

| ST | Type | Frequency, | Percent , | Row Pct , | Col Pct ,FamPlan ,FluVac ,HBVac ,HIVSc ,Imun ,Maty ,Other ,PNEVac ,STI ,TB , Total |
|------|------|--|--|---|--|
| NDac | | , 554, 0, 0, 0, 970, 12, 1342, 0, 1195, 66, 4139 | , 0.03, 0.00, 0.00, 0.00, 0.05, 0.00, 0.07, 0.00, 0.06, 0.00, 0.22 | , 13.38, 0.00, 0.00, 0.00, 23.44, 0.29, 32.42, 0.00, 28.87, 1.59, | , 0.16, 0.00, 0.00, 0.00, 0.33, 0.13, 0.14, 0.00, 0.42, 0.52, |
| NHam | | , 1794, 0, 0, 0, 5017, 82, 17467, 0, 102, 258, 24720 | , 0.10, 0.00, 0.00, 0.00, 0.27, 0.00, 0.93, 0.00, 0.01, 0.01, 1.31 | , 7.26, 0.00, 0.00, 0.00, 20.30, 0.33, 70.66, 0.00, 0.41, 1.04, | , 0.51, 0.00, 0.00, 0.00, 1.72, 0.91, 1.86, 0.00, 0.04, 2.04, |
| NJer | | , 301, 0, 0, 0, 155, 3, 48437, 0, 85, 20, 49001 | , 0.02, 0.00, 0.00, 0.00, 0.01, 0.00, 2.57, 0.00, 0.00, 0.00, 2.60 | , 0.61, 0.00, 0.00, 0.00, 0.32, 0.01, 98.85, 0.00, 0.17, 0.04, | , 0.09, 0.00, 0.00, 0.00, 0.05, 0.03, 5.17, 0.00, 0.03, 0.16, |
| NMex | | , 1045, 5, 0, 0, 308, 37, 1117, 5, 243, 28, 2788 | , 0.06, 0.00, 0.00, 0.00, 0.02, 0.00, 0.06, 0.00, 0.01, 0.00, 0.15 | , 37.48, 0.18, 0.00, 0.00, 11.05, 1.33, 40.06, 0.18, 8.72, 1.00, | , 0.30, 0.18, 0.00, 0.00, 0.11, 0.41, 0.12, 0.71, 0.09, 0.22, |
| NYor | | , 4578, 13, 1, 0, 2058, 148, 315838, 1, 1368, 66, 324071 | , 0.24, 0.00, 0.00, 0.00, 0.11, 0.01, 16.73, 0.00, 0.07, 0.00, 17.16 | , 1.41, 0.00, 0.00, 0.00, 0.64, 0.05, 97.46, 0.00, 0.42, 0.02, | , 1.30, 0.46, 10.00, 0.00, 0.71, 1.64, 33.72, 0.14, 0.48, 0.52, |
| Nebr | | , 51, 0, 0, 0, 79, 1, 411, 0, 30, 2, 574 | , 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.02, 0.00, 0.00, 0.00, 0.03 | , 8.89, 0.00, 0.00, 0.00, 13.76, 0.17, 71.60, 0.00, 5.23, 0.35, | , 0.01, 0.00, 0.00, 0.00, 0.03, 0.01, 0.04, 0.00, 0.01, 0.02, |
| Neva | | , 381, 0, 0, 0, 292, 12, 1064, 0, 129, 18, 1896 | , 0.02, 0.00, 0.00, 0.00, 0.02, 0.00, 0.06, 0.00, 0.01, 0.00, 0.10 | , 20.09, 0.00, 0.00, 0.00, 15.40, 0.63, 56.12, 0.00, 6.80, 0.95, | , 0.11, 0.00, 0.00, 0.00, 0.10, 0.13, 0.11, 0.00, 0.05, 0.14, |

```

#####
Ohio , 4134, 17, 0, 0, 2807, 27, 4624, 0, 3110, 55, 14774
, 0.22, 0.00, 0.00, 0.00, 0.15, 0.00, 0.24, 0.00, 0.16, 0.00, 0.78
, 27.98, 0.12, 0.00, 0.00, 19.00, 0.18, 31.30, 0.00, 21.05, 0.37,
, 1.17, 0.61, 0.00, 0.00, 0.96, 0.30, 0.49, 0.00, 1.10, 0.44,
#####
Okla , 4879, 5, 0, 0, 716, 141, 4359, 2, 693, 155, 10950
, 0.26, 0.00, 0.00, 0.00, 0.04, 0.01, 0.23, 0.00, 0.04, 0.01, 0.58
, 44.56, 0.05, 0.00, 0.00, 6.54, 1.29, 39.81, 0.02, 6.33, 1.42,
, 1.38, 0.18, 0.00, 0.00, 0.25, 1.56, 0.47, 0.28, 0.25, 1.23,
#####
Total 352729 2796 10 3 291336 9049 936642 709 282286 12637 1888197
18.68 0.15 0.00 0.00 15.43 0.48 49.61 0.04 14.95 0.67 100.00
(Continued)

```

Total number of records in Public Health Department Data set by State 24
14:12 Saturday, October 21, 2017

The FREQ Procedure

Table of ST by Type

```

ST   Type

Frequency,
Percent ,
Row Pct ,
Col Pct ,FamPlan,FluVac ,HBVac ,HIVSc ,Imun ,Maty ,Other ,PNEVac ,STI ,TB , Total
#####
Oreg , 2395, 12, 0, 0, 2437, 44, 3965, 0, 1491, 131, 10475
, 0.13, 0.00, 0.00, 0.00, 0.13, 0.00, 0.21, 0.00, 0.08, 0.01, 0.55
, 22.86, 0.11, 0.00, 0.00, 23.26, 0.42, 37.85, 0.00, 14.23, 1.25,
, 0.68, 0.43, 0.00, 0.00, 0.84, 0.49, 0.42, 0.00, 0.53, 1.04,
#####
Penn , 342, 1, 0, 0, 385, 8, 14287, 1, 319, 5, 15348
, 0.02, 0.00, 0.00, 0.00, 0.02, 0.00, 0.76, 0.00, 0.02, 0.00, 0.81
, 2.23, 0.01, 0.00, 0.00, 2.51, 0.05, 93.09, 0.01, 2.08, 0.03,
, 0.10, 0.04, 0.00, 0.00, 0.13, 0.09, 1.53, 0.14, 0.11, 0.04,
#####
Puer , 1, 0, 0, 0, 2, 0, 14, 0, 0, 1, 18
, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
, 5.56, 0.00, 0.00, 0.00, 11.11, 0.00, 77.78, 0.00, 0.00, 5.56,
, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.01,
#####
Rhol , 1679, 0, 0, 0, 7209, 5, 1549, 0, 7388, 1, 17831
, 0.09, 0.00, 0.00, 0.00, 0.38, 0.00, 0.08, 0.00, 0.39, 0.00, 0.94
, 9.42, 0.00, 0.00, 0.00, 40.43, 0.03, 8.69, 0.00, 41.43, 0.01,
, 0.48, 0.00, 0.00, 0.00, 2.47, 0.06, 0.17, 0.00, 2.62, 0.01,
#####
SCar , 19549, 0, 0, 0, 485, 2247, 49503, 1, 2172, 6, 73963
, 1.04, 0.00, 0.00, 0.00, 0.03, 0.12, 2.62, 0.00, 0.12, 0.00, 3.92
, 26.43, 0.00, 0.00, 0.00, 0.66, 3.04, 66.93, 0.00, 2.94, 0.01,
, 5.54, 0.00, 0.00, 0.00, 0.17, 24.83, 5.29, 0.14, 0.77, 0.05,
#####
SDac , 67, 0, 0, 0, 62, 3, 120, 0, 54, 2, 308
, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.01, 0.00, 0.00, 0.00, 0.02
, 21.75, 0.00, 0.00, 0.00, 20.13, 0.97, 38.96, 0.00, 17.53, 0.65,
, 0.02, 0.00, 0.00, 0.00, 0.02, 0.03, 0.01, 0.00, 0.02, 0.02,
#####
Tenn , 1770, 51, 0, 0, 1271, 92, 6678, 3, 1582, 365, 11812
, 0.09, 0.00, 0.00, 0.00, 0.07, 0.00, 0.35, 0.00, 0.08, 0.02, 0.63
, 14.98, 0.43, 0.00, 0.00, 10.76, 0.78, 56.54, 0.03, 13.39, 3.09,
, 0.50, 1.82, 0.00, 0.00, 0.44, 1.02, 0.71, 0.42, 0.56, 2.89,
#####
Texa , 24271, 32, 0, 0, 55694, 724, 65456, 626, 42776, 871, 190450
, 1.29, 0.00, 0.00, 0.00, 2.95, 0.04, 3.47, 0.03, 2.27, 0.05, 10.09

```

, 12.74, 0.02, 0.00, 0.00, 29.24, 0.38, 34.37, 0.33, 22.46, 0.46,
, 6.88, 1.14, 0.00, 0.00, 19.12, 8.00, 6.99, 88.29, 15.15, 6.89,

Utha , 13246, 4, 0, 0, 38841, 13, 7270, 1, 39074, 27, 98476
, 0.70, 0.00, 0.00, 0.00, 2.06, 0.00, 0.39, 0.00, 2.07, 0.00, 5.22
, 13.45, 0.00, 0.00, 0.00, 39.44, 0.01, 7.38, 0.00, 39.68, 0.03,
, 3.76, 0.14, 0.00, 0.00, 13.33, 0.14, 0.78, 0.14, 13.84, 0.21,

Total 352729 2796 10 3 291336 9049 936642 709 282286 12637 1888197
18.68 0.15 0.00 0.00 15.43 0.48 49.61 0.04 14.95 0.67 100.00

(Continued)

Total number of records in Public Health Department Data set by State 25
14:12 Saturday, October 21, 2017

The FREQ Procedure

Table of ST by Type

| ST | Type | Frequency, | Percent , | Row Pct , | Col Pct , | FamPlan | FluVac | HBVAc | HIVSc | Imun | Maty | Other | PNEVac | STI | TB | Total |
|-------|------|------------|-----------|-----------|-----------|---------|--------|-------|-------|------|-------|-------|--------|------|-------|-------|
| Verm | | 46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| | | | 7.72 | 0.00 | 0.00 | 0.00 | 15.94 | 0.17 | 73.99 | 0.00 | 1.51 | 0.67 | 0.01 | 0.00 | 0.00 | 0.03 |
| Virg | | 4573 | 0.24 | 0.00 | 0.00 | 0.16 | 0.00 | 0.30 | 0.00 | 0.15 | 0.01 | 0.86 | 28.03 | 0.01 | 0.01 | 0.00 |
| | | | 28.03 | 0.01 | 0.01 | 0.00 | 18.88 | 0.55 | 34.69 | 0.00 | 17.19 | 0.64 | 1.30 | 0.07 | 10.00 | 0.00 |
| WVir | | 34 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 8.21 | 0.00 | 0.00 | 0.00 |
| | | | 8.21 | 0.00 | 0.00 | 0.00 | 27.05 | 0.00 | 43.24 | 0.00 | 21.50 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| WaDC | | 33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 12.31 | 0.00 | 0.00 | 0.00 |
| | | | 12.31 | 0.00 | 0.00 | 0.00 | 3.36 | 0.00 | 81.34 | 0.00 | 2.61 | 0.37 | 0.01 | 0.00 | 0.00 | 0.01 |
| Wasi | | 4296 | 0.23 | 0.00 | 0.00 | 1.05 | 0.00 | 0.10 | 0.00 | 0.02 | 0.00 | 1.39 | 16.35 | 0.32 | 0.00 | 0.00 |
| | | | 16.35 | 0.32 | 0.00 | 0.00 | 75.13 | 0.05 | 6.87 | 0.00 | 1.25 | 0.03 | 1.22 | 3.04 | 0.00 | 0.00 |
| Wisc | | 338 | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.09 | 20.29 | 0.06 | 0.00 | 0.00 |
| | | | 20.29 | 0.06 | 0.00 | 0.00 | 20.17 | 0.36 | 54.20 | 0.00 | 3.96 | 0.96 | 0.10 | 0.04 | 0.00 | 0.00 |
| Wyom | | 486 | 0.03 | 0.00 | 0.00 | 0.02 | 0.00 | 0.05 | 0.00 | 0.02 | 0.00 | 0.12 | 20.80 | 0.04 | 0.00 | 0.00 |
| | | | 20.80 | 0.04 | 0.00 | 0.00 | 17.77 | 0.86 | 41.31 | 0.00 | 18.24 | 0.98 | 0.14 | 0.04 | 0.00 | 0.00 |
| Total | | 352729 | 18.68 | 0.15 | 0.00 | 0.00 | 15.43 | 0.48 | 49.61 | 0.04 | 14.95 | 0.67 | 100.00 | | | |

APPENDIX E

ADDITIONAL FIGURES

