EVALUATING HEALTH INSURANCE MARKETPLACE ENROLLMENT OF THE
UNINSURED UNDER THE AFFORDABLE CARE ACT:
AN EXAMINATION OF EXTERNAL AND INTERNAL MARKETPLACE
MECHANISMS

by

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ABSTRACT

HOLLIE LYNNE TRIPP. Evaluating health insurance marketplace enrollment of the uninsured under the Affordable Care Act: An examination of external and internal market mechanisms. (Under the direction of DR. WILLIAM P. BRANDON)

Background: The establishment of health insurance marketplaces (HIMs) offering a market-based response to the need for health care reform was one of the primary provisions of the Affordable Care Act (ACA). The HIMs provided a virtual space in which insurers could compete to provide coverage for consumers who lacked traditional methods of access. Enrollment is crucial to the sustainability of HIMs; however, increasing numbers of insurers are withdrawing from the market, leaving concentrated power to drive up premium prices.

Questions: This paper examines the various factors of HIM enrollment by answering two questions: (1) What are the external factors that influenced HIM enrollment of the uninsured during the first three years of implementation? (2) What are the internal mechanisms of a HIM that drove enrollment of the uninsured during the third open enrollment period? Answers to these questions are then used to draft policy recommendations to improve HIM enrollment.

Methods: A panel study of state level (external) factors from all HIMs were analyzed using a fractional logit model. Key explanatory variables were chosen from program uptake literature. The study regarding internal factors of HIM enrollment required a multilevel model of county and state level data from 43 HIMs. Key explanatory variables were chosen based on their ability to measure the 3Cs, a previously untested framework that suggested the key features of a successful HIM.

Results: External drivers of HIM enrollment of the uninsured were: Medicaid expansion, education and gender of the population, and the average amount of federal subsidies available to state consumers. Medicaid expansion and educational attainment remained significant controls in the second study. In terms of the 3Cs, the number of insurers and generosity of financial aid (competition) increased enrollment. Increased numbers of filter and sort features (commoditization) were shown to have a negative effect on enrollment.

Implications and Conclusions: In testing the 3Cs, there is utility in using it to analyze HIM enrollment success; however, suggested modifications may enhance its capacity as a predictive model. State level variables and measures of the 3Cs, external and internal factors of HIM enrollment, suggested common problems with health literacy and affordability of plans. Policy recommendations that follow from these observations can ameliorate the problems.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

3Cs	competition, commoditization, and communication
3Rs	risk corridors, reinsurance, and risk adjustment
ACA	Affordable Care Act
ACO	accountable care organization
APTC	annual premium tax credit
ASPE	Assistant Secretary for Planning and Evaluation
CCIIO	Center for Consumer Information and Insurance Oversight
CMS	Centers for Medicaid and Medicare Services
D.C.	District of Columbia
ED	emergency department
FFM	federally-facilitated marketplace
FPL	federal poverty level
GLM	generalized linear model
GRA	geographic rating area
HHI	Herfindahl-Hirschman Index
HHS	U.S. Department of Health and Human Services
HIM	health insurance marketplace
LR	likelihood ratio test
MLM	multilevel model
OEP	open enrollment period
OLS	ordinary least squares

P.L.	public law
QHP	qualified health plan
SBM	state-based marketplace
SHOP	small business health options program
SPM	state-partnership marketplace
U.S.	United States
VIF	variance inflation factor

CHAPTER 1: INTRODUCTION

1.1 Background on the Affordable Care Act

The Patient Protection and Affordable Care Act (ACA; P.L. 111-148 and 152) is a health insurance reform law that sought to make coverage more accessible to and affordable for American citizens. A book-length study evaluating ACA enrollment requires the reader to have a firm grasp of the major features of the ACA and the details that are essential for understanding the analytical studies which follow. A review of the existing published literature is also necessary to position this study within the broader research context and to demonstrate its unique contribution to our understanding of efforts to provide health care by subsidizing the purchase of insurance. Thus, this brief introduction provides the necessary background knowledge of the ACA and the chapter that follows reviews the relevant literature.

Prior to the passage of the ACA, health insurance in the United States (U.S.) was accessible in one of four ways: employment-sponsored group insurance; Medicare, for those over 65 and the disabled; Medicaid, for the poor and disabled; and private insurance based on medical underwriting for individuals (Claxton, Cox, Damico, Levitt, & Pollitz, 2016; Starr, 2011). Medical underwriting was a process of evaluating a person for health coverage based on one's risk of incurring higher than average health care costs (Claxton et al., 2016). If an individual had a pre-existing health condition indicating greater risk, the person's insurance company was legally able to deny coverage, impose a waiting period before covering costs generated by that specific condition, and/or charge high premiums for such coverage (Claxton et al., 2016). As a consequence of higher

prices for individual plans, those without access to public health insurance or coverage through an employer, often remained uninsured.

Individuals without health insurance had to pay for health care costs out of pocket (Reid, 2009). In 2012, one third of Americans reported that they were struggling to pay medical bills (Pollitz, Cox, Lucia, & Keith, 2014a). Even those with health insurance could be affected by medical debt (Pollitz et al., 2014a). Medical expenses accounted for around two-thirds of bankruptcies; seventy-five percent of those cases involved people with health insurance (Himmelstein, Thorne, Warren, & Woolhandler, 2009). The U.S. has some of the highest health care costs in the world and some of the worst health outcomes when compared to other industrialized nations (Squires & Anderson, 2015) Specifically, the United States ranks last in terms of health and mortality among developed nations, has a high percentage of individuals who are underinsured or uninsured, and maintains high levels of chronic diseases (attributed to poor preventive care) (Chatterjee, Kubendran, King, & DeVol, 2014; Davis, Stremikis, Squires, & Schoen, 2014).

The successful enrollment of individuals into health insurance may ameliorate some of those public health concerns. According to one study, the accessibility of health insurance and enrollment in health insurance plans--or, more generally, "financial access" to health care--are the first of many steps upon which the achievement of quality health care delivery is predicated (Eisenberg & Power, 2000). Health insurance has been linked to health care access (Aday & Andersen, 1974; Newacheck, Stoddard, Hughes, & Pearl, 1998). Several studies have demonstrated how access may improve health care outcomes (Kasper, Giovannini, & Hoffman, 2000; Weissman, Stern, Fielding, & Epstein, 1991).

However, according to the U.S. Census Bureau, in 2010 there were 47 million who were uninsured in the U.S. (Garfield, Licata, & Young, 2014).

The ACA provides four structures of health coverage to those without access to coverage: Medicare, expanded Medicaid, employer-sponsored plans, and health insurance marketplaces (HIMs) (Brandon, 2012). In terms of Medicare, in 2020 the ACA will have phased out the "donut hole" in Medicare Part D—a gap in prescription drug coverage wherein beneficiaries are responsible for total costs from $2800 until out-of-pocket costs reach $4550, after which cost-sharing resumes (Blum, 2010). The ACA also changes the nature of employer-sponsored coverage, requiring employers with 50 or more employee to provide health coverage to employees or risk having to pay a penalty. Employers were allowed to continue offering pre-ACA plans; however, those plans had to be moderately modified to align with certain, but not all, ACA requirements (Jost, 2010). These pre-ACA plans are known as *grandfathered* plans and their status is revoked if major changes are made that disadvantage enrollees (Jost, 2010). Smaller employers were exempt from the mandate to offer coverage or pay a penalty, but were encouraged to offer group health insurance plans for their employees through the creation of the Small Business Health Options Program (SHOP).

The other two sources of health insurance coverage pertain to Medicaid expansion and HIMs; they will be discussed at greater length later in this chapter. Medicaid expansion provides coverage to all individuals who lack other coverage and whose annual incomes fall below 138% federal poverty level (FPL). States are able to decide whether or not they will expand Medicaid. HIMs were created to provide coverage to individuals who do not have access to affordable employer-sponsored coverage,

Medicaid, or other sources of coverage. The HIM allows insurance companies to compete for the individual consumer seeking health coverage.

In 2009 the Obama administration employed a neoliberal, or market-based solution via the HIM, in lieu of social insurance alternatives such as Medicare-for-all. With a typical market good, consumers are assumed to make a rational choice based on maximizing expected utility (Arrow, 1963). Health care, unlike a typical commodity, is a complex issue in which buyers do not have the information to know whether medical procedures are necessary or appropriate (Brandon & Carnes, 2014). They are reliant on physicians to prescribe necessary treatment; however, physician self-interest encourages prescription of unnecessary services (Arrow, 1963). In contrast, health policy experts have fixed upon insurers as the vehicle for consolidating financial resources and making payment decision that will enforce some price and volume control on the fee-for-service market for health services that would otherwise run wild (Havighurst, 1977). The health insurance industry is able to constrain health costs by negotiating provider reimbursement and incentivizing consumers to use appropriate amounts of care. However, individual health insurance was inaccessible to millions of Americans due to high costs based on an individual's risk and Americans came to depend on employment-sponsored group health insurance instead. The ACA provided for HIMs to create a vehicle that would overcome the many difficulties faced by individuals forced to secure health insurance on the individual market; a similar arrangement with different names had been a mainstay of the Clinton proposals for health reform in the 1990s (Brandon & Carnes, 2014). The HIMs were to generate competition among insurers to keep premiums low and attract enrollees.

The HIMs also make private coverage more affordable through subsidies, or vouchers, without interfering with market forces of supply and demand.

Once passed, several of the components in the ACA were contested by conservative politicians. Republicans, who generally support small government and do not favor redistribution of income, do not support the government providing subsidies for lower-income families (Dalen, Waterbrook, & Alpert, 2015). However, the chief concern of Republicans was the individual mandate, a provision of the ACA that required people to purchase health insurance or pay a penalty. Conservatives argued that the mandate infringed on personal liberties by requiring individuals to enter into a commercial transaction (Moffit, 2011). Under well-established constitutional law the commerce clause gave the federal government the power to regulate economic relationships once initiated. Many states filed lawsuits against the constitutionality of the individual mandate arguing that it violated Americans' inherent right not to enter into a commercial relationship. This initial legal assault on the ACA was settled by the *National Federation of Independent Business (NFIB) v. Sebelius* case in which the U.S. Supreme Court agreed with the plaintiff's argument regarding the commerce clause, but justified the statutory mandate to purchase insurance on the basis of the taxing power of the federal government ("NFIB v. Sebelius," 2012).

The individual mandate was considered necessary to require healthy individuals, as well as those who expected to incur extensive medical costs to pay into broad financial risk pools from which medical expenses are paid. ACA provisions also ban denial of coverage of pre-existing conditions, waiting periods, and lifetime limits on expenditures by the insurer on care for extremely high utilizers. If sicker or disabled individuals were

disproportionately enrolled by an insurance company (which would then be said to suffer "adverse selection"), the insurance company would spend more than it generated in premiums. Insurance companies facing such adverse selection find themselves in the so-called insurance "death spiral" in which they must raise premiums, causing their healthier insured to drop coverage. With a decreasing consumer population, companies implemented another round of premium increases resulting in even smaller and sicker numbers of subscribers willing and able to pay premiums (Friedman, 2002). Therefore, it was critical for the young and healthy to buy insurance to create a balanced population that comprised a range of health states. However, if people were forced to enroll, affordable options had to be available. The ACA created mechanisms to increase enrollment with two major provisions: the expansion of Medicaid and the creation of HIMs for individuals buying insurance on their own. (A parallel market for small employers, defined as having fewer than 100 employees, is available to employees of such companies).

1.2 Background on Medicaid

Medicaid, the product of Republican and Democratic compromise, was created by an amendment to the Social Security Act of 1935 (Social Security Amendments, 1965). Although the federal government established certain parameters for the program regarding mandatory and optional benefits and beneficiaries, the states were given responsibility for designing and implementing Medicaid in line with federal regulations. Although federal money is distributed to states with conditions, state Medicaid programs can vary greatly.

Prior to the ACA, Medicaid was a categorical entitlement program and therefore did not cover all low-income individuals; for example, low-income childless adults without a disability were ineligible in most states (Paradise, 2015). The *maximum* income level to qualify for Medicaid was as low as 44% of the FPL for certain categories of beneficiaries in some states, but the proposed expansion extended eligibility to all individuals earning at or below 138% FPL (Garfield et al., 2014). To pay for Medicaid expansion, the federal government agreed to pay 100% of the cost for newly eligible recipients until 2016, when the percentage of federal responsibility would begin to gradually decrease until it reached 90% for 2020 and subsequent years.

After the ACA became law there were several challenges citing the unconstitutional nature of this particular Medicaid expansion. In another part of *National Federation of Independent Business (NFIB) v. Sebelius* the Supreme Court ruled that Medicaid expansion was "unconstitutionally coercive" because states that chose not to expand would lose all federal funding (Musumeci, 2012). That conclusion allowed states to decide whether or not they would expand Medicaid without facing penalties for noncompliance.

Initially, twenty states chose not to expand Medicaid, which created an unanticipated coverage gap (Glied & Ma, 2013). Under the ACA as enacted those earning below 100% FPL would qualify for Medicaid if states had expanded Medicaid as required by the law prior to *National Federation* case and were thus deemed ineligible to apply for HIM plan subsidies by the Act. Therefore, after the Supreme Court ruled many legal residents who lived in states that did not expand Medicaid were ineligible for the state's traditional Medicaid, but were also excluded from HIM subsidies because they

had family incomes below 100% FPL. Some 2.6 million people were in this coverage gap in 2016 (Garfield & Damico, 2016). With control of the U.S. House of Representatives passing to the Republicans in 2010, no legislative remedy for this obvious flaw in implementing the ACA could be enacted.

1.3 Background on HIMs

HIMs were conceived as a market solution to provide access to many health insurance plans to uninsured Americans who lacked access to affordable employment-sponsored health insurance or other sources of health coverage. The HIM was a virtual marketplace in which health insurance companies competed for consumers. States were able to choose which type of HIM to implement: state-based marketplaces (SBMs), a partnership of the state and federal government (state partnership marketplaces, SPMs), or federally-facilitated marketplaces (FFMs). The U.S. Department of Health and Human Services managed FFMs and SPMs. SBMs were able to choose whether a state agency or a non-profit would govern the HIM (Dash, Monahan, & Lucia, 2013).

The primary functions of all HIMs were eligibility determination and enrollment in an insurance plan or referral to Medicaid of those found eligible, consumer outreach/assistance, plan management, and financial management (Dash et al., 2013). According to the Center for Consumer Information and Insurance Oversight (CCIIO), eligibility and enrollment are accomplished on the HIM's website, the interface through which all enrollees must apply (2013). Even those who applied over the phone or with assistance had their applications processed by the website. Consumer outreach was achieved through the use of consumer assisters; the HIM governance decided how to train, certify, and oversee consumer assisters who engaged consumers using the website

(CCIIO, 2013). Plan management refers to which plans were allowed on HIM websites and how the HIM governance regulated those insurance companies (Cousart, Riley, & Shiras). Finally, financial management allowed HIMs to generate revenues so that their operations could be self-sustaining. Although SPMs used the FFM website, SPMs retained the ability to make procedural and policy decisions like how consumer assisters would be trained (Cole, Karl, & Wade, 2016).

For an individual to be eligible to purchase an insurance plan from a HIM with financial assistance, s/he could not have access to Medicare, Medicaid, other government programs or affordable employer-sponsored coverage. Affordable coverage was determined by whether the cost of the plan for one person was 9.5% or less of the household's modified adjusted gross income (Tolbert, 2015). For example, if an employment sponsored plan covered the worker at a cost to the employee that amounted to 8% of the worker's modified adjusted gross income (reported on the family's federal tax returns), the plan would be considered affordable. If that plan allowed the employee to buy dependent or family coverage for an additional payment that brought the total employee cost above 9.5%, no one in the family could purchase subsidized health insurance on the HIM. (If employment-sponsored plans did not permit family coverage, family members other than the covered worker may enroll through HIMs and seek to qualify for subsidized insurance if they lack access to other coverage, such as Medicare or veterans' coverage). In general, under the ACA as it exists in June 2017, if affordable coverage is not available to an individual through the federal government or an employer, a person can purchase insurance through the HIM and receive a subsidy for that purchase if the relevant income does not exceed 400% FPL.

When individuals sought insurance via the HIMs, they first had to create an application. Then their identity, income, and citizenship status had to be verified by the Department of Health and Human Services (HHS), the Internal Revenue Service, and Homeland Security which cooperated to create the "data hub." Once consumers' identities were confirmed, they would receive information about the amount of subsidies, if any, they would receive.

Purchasing HIM plans was different from purchasing health insurance from other sources: HIMs were required to offer qualified health plans (QHPs). QHPs were plans that offered essential health benefits and met ACA cost-sharing requirements (HHS, 2013). The 10 essential benefits were: outpatient care, emergency services, hospitalization, maternity care, mental health services, prescription drugs, rehabilitation services, laboratory services, preventive care, and pediatric services (HHS, 2013). The cost-sharing of four levels of plans were offered based on how much of the yearly cost of medical services for the average patient that average patients would have to pay under a given policy. The four tiers were categorized by different metals: bronze, silver, gold, and platinum. The tiers represented the actuarial values of the plans: 60%, 70%, 80%, and 90% of expected costs would be paid by the insurer. In other words these percentages indicated the average financial responsibility of the insurance company for the health costs incurred by policy holders. Premiums for QHPs of the same tier may only vary at the individual level for age differences, tobacco use, and residence. Age can affect rates by no more than a 3:1 ratio while rates can vary no more than 1.5:1 for those who use tobacco.

Because health coverage was required for most U.S. residents, consumers seeking

health insurance offered through the marketplace could obtain website assistance from

trained assisters. Consumer assisters or "navigators" provided outreach, education, and

assistance using the HIM website. Their advice was impartial in that they were not

allowed to make recommendations about which insurer or plan consumers should choose

(Tripp, 2015).

HIMs were also the only way in which eligible consumers could obtain federal

subsidies to help them purchase health insurance; individuals choosing a health insurance

plan outside of the HIM received no financial assistance even when meeting the financial

qualifications. The two forms of financial assistance available to consumers were

advanced premium tax credits (APTC) and cost-sharing subsidies. APTCs were available

to those with incomes between 100% and 400% FPL. If eligible for APTC, the level of

assistance that consumers received was based upon the premium cap for their income

level and the cost of the second lowest priced silver plan available to them. This subsidy

could be applied to any plan offered through the HIM. Individuals could choose to apply

the subsidy to the premium each month or as a credit on their tax return at the end of the

year. Subsidized cost-sharing was available to individuals between 100%-250% FPL who

purchased a silver plan (HHS, 2013). Cost-sharing assisted the individual in paying out-

of-pocket expenses like copayments and deductibles. Both types of subsidies were paid to

the insurer by the government, unless the individual chose to apply the APTC to their tax

returns.

As explained previously, the premiums charged for QHPs offered on the HIM

could only vary at the individual level for age, tobacco use, and place of residence, i.e.,

modified community rating replaced individual rating insurance algorithms. If premiums were not based on groups of people but on the individual, those who were sick or at greater risk of illness would pay much higher premiums than those who were healthy. States were permitted to choose geographic rating areas (GRAs) that insurance companies could use for community rating. The Centers for Medicaid and Medicare Services (CMS, 2013) indicated that the three options for GRAs were metropolitan statistical areas, zip codes, or counties/groups of counties; many states utilized the county option. Insurance companies then gathered claims data from each local GRA area to establish their plans' premium prices for individuals living in the area. For example, if two non-smoking 34 year-olds were purchasing the same silver plan in the same GRA, their premiums for a given plan would be the same.

To deter insurance companies from cherry-picking GRAs with lower than average health care expenditures, the ACA created a few deterrents (Cox, Levitt, Claxton, Ma, & Duddy-Tenbrunsel, 2014). The 3 Rs–risk adjustment, reinsurance, and risk corridors– refer to ways that insurance companies were incentivized to avoid enrolling only health communities (Cox et al., 2014). Risk adjustment was created to redistribute funds from insurers that enrolled a healthier population to those who insured high-risk populations (Cox, Semanskee, Claxton, & Levitt, 2016b). Reinsurance and risk corridors were temporary provisions created by the ACA to reimburse insurers for high-cost enrollees and ensure premium stability (Cox et al., 2016b).

1.4 Outline of Dissertation and Significance of Studies

After this "Introduction" this dissertation provides a comprehensive literature review regarding the effects of Medicaid expansion and HIM type on enrollment. That

exploration will ground my research within the broader research context. The methods and findings Chapters 3 and 4, present 2 studies: a panel study of state level factors that influenced HIM enrollment of the uninsured and a multilevel study of internal HIM mechanisms (3Cs) that were thought to influence HIM enrollment of the uninsured by incorporating *all* enrollment years before the 2016 elections and all the 43 HIMs that supply comparable data. The discussion will include policy recommendations.

Several aspects of this dissertation set it apart from the growing literature on the ACA. It evaluates ACA enrollment of the uninsured at a level not yet investigated by incorporating all enrollment years before the 2016 elections and all the 43 HIMs that supply comparable data. In addition, it examines the usefulness of a previously untested framework that has been proposed as a general analytic tool for understanding and improving the process of enrolling in any insurance program (Brandon & Carnes, 2014).

The fate of the ACA is unknown in June 2017. It is clear that the American Health Care Act, which was passed by the House of Representatives and is currently under consideration in the U.S. Senate, will rely on private insurance markets with some sort of federal financial subsidy to enable lower and middle-class families to purchase insurance if they choose. If the ACA should be repealed, such evaluations as this one will continue to be important, because their lessons can guide future health insurance reform and improve the quality of public health in the United States. In particular, examining problems with the neoliberal approach to providing health insurance can lead to greater understanding about how HIM and other sorts of health exchanges can be improved. If deregulatory strategies to expand health coverage are to be successful, policymakers must

address market failures in health insurance just as they must in other markets for life-sustaining commodities.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

There were two primary provisions of the ACA that augmented health insurance

enrollment in the United States: the expansion of Medicaid and the creation of HIMs.

This literature review investigates why states may have chosen to implement these

provisions and evaluates the effects of each during the first 3 open enrollment periods

(OEPs). This chapter aims to illuminate gaps in the literature, particularly in regards to

HIM enrollment of the uninsured.

2.2 The Decision to Expand

Since 1965, Medicaid has been expanded several times to allow more low-income

individuals to enroll. For example, Social Security Amendments to Title XIX raised the

income threshold for pregnant women and infants in 1984 and opened coverage to legal

immigrants who have lived in the United States for at least 5 years in 1996 (Brandon,

2012; KFF, 2015). States have generally accepted such expansions in exchange for the

federal matching funds of 50% or more that accompany greater state expenditures

(Brown & Sparer, 2003). Yet despite early projections that collectively states would lose

billions of dollars without Medicaid expansion, initially 20 states declined to expand and

thus maintained their pre-ACA Medicaid programs (Buettgens, Dorn, & Carroll, 2011;

Glied & Ma, 2013). In addition to passing on the chance of expanding services to their

poor citizens with the federal government paying 90% or more of expansion costs,

succoring their hospitals burdened by large uncompensated care budgets and generally

stimulating their jobs and economies with a continuous inflow of out-of-state money, the

more affluent citizens of these non-expansion states were forced to contribute through their federal taxes to Medicaid expansion in other states. Clearly there were political, social, and economic reasons driving state decision-making on Medicaid expansion.

Several studies have cited politicization of the ACA as the reason states failed to adopt Medicaid expansion (Barrilleaux & Rainey, 2014; Skocpol, 2010). Over 80% of the states that opted out had Republican governors (Grant, 2014). In several of those states, governors used internal estimates of the costs of expanded Medicaid to suggest that expansion would be unwise; however, unbiased policy research centers found that these state estimates were inflated (Angeles, 2012). To further justify not expanding Medicaid, conservative politicians misinterpreted findings from the Oregon Health Insurance Experiment by claiming that the experiment showed Medicaid expansion yielded no benefits (Klein, 2013). Opponents of the ACA spent roughly 80% more on television ads against the ACA than advocates spent in support (Goodnough, 2013). These negative advertisements and press depictions of beneficiaries can affect policy durability (Chattopadhyay, 2015). Other studies perceived ideology as but one of many reasons that states may have chosen not to expand Medicaid (Miller & Blanding, 2012; Rigby, 2012). For example, Jacobs & Callaghan (2013) noted how some Republican governors expanded Medicaid despite resistance from other conservative politicians in their states. They suggested that considering ideology as the sole driver of expansion ignores policy trajectories and administrative capacity as possible factors in decision-making (Jacobs & Callaghan, 2013).

Social and racial differences may have influenced state decisions regarding Medicaid expansion. Those who apply for Medicaid generally have low income;

however, some who receive Medicaid are considered more deserving than others (Swartz,

2009). Those who are believed to be undeserving are those who do not work, are

childless, or are single-parents (Moffitt, 2015). The expansion of Medicaid eliminates the

categories of deservedness by providing health insurance coverage to all those with

incomes below 138% FPL (Brandon, 2012). However, other researchers contend that race

is a factor influencing Medicaid expansion because welfare policies implemented at the

state-level are racially biased (Soss, Fording, & Schram, 2011; Zhu & Clark, 2015). In a

recent study, Grogan and Park (2017) demonstrated that a population with a greater

percent of Black residents decreased the likelihood of expansion. Furthermore, they

revealed that White support is more indicative of policy adoption than non-White support

(Grogan & Park, 2017). Those with higher levels of income participate more in politics

(e.g. voting) than those with lower incomes (Schlozman, Verba, & Brady, 2012). Black

workers earn less than their White counterparts and the majority of those who live below

poverty are non-White (Proctor, Semega, & Kollar, 2015; Wilson & Rodgers, 2016).

Politicians are most responsive to the wealthy and to voters who can help them be

reelected (Downs, 1957; Mayhew, 1974; Rhodes & Schaffner, 2013). Such political bias

prevents those without power from having a voice in policy (Schattschneider, 1960).

There were also economic reasons why states may have decided not to expand

Medicaid. Some states expressed concern about increasing Medicaid eligibility

requirements, because they feared people would quit their jobs or move to part-time work

to secure public health insurance (Gooptu, Moriya, Simon, & Sommers, 2016). Hospital

reimbursement was also a consideration. Prior to the ACA, hospitals received

supplemental payments for uncompensated care, care for those without health insurance

or other payment source. However, the ACA anticipated that far fewer patients would generate unpaid hospital bills because they would have access to coverage; therefore, supplemental payments to hospitals with a disproportionate share of uninsured patients were phased out. Because these hospitals would receive less money for uncompensated care, states had to consider financial ramifications of failing to expand. However, when examining the economic needs of a state, Barrilleaux & Rainey (2014) found that it was not a factor in the decision to expand.

2.3 Pre-ACA Studies regarding Medicaid Expansion

Medicaid expansion was anticipated to increase Medicaid enrollment rates; however, earlier studies indicated that Medicaid "take-up" rates for the newly eligible hovered around 60% and around 24% for the long-term eligible who had not previously enrolled (Holahan, Buettgens, Carroll, & Dorn, 2012; Sommers & Epstein, 2010). And while one might assume that the individual mandate, the requirement to be insured or pay a penalty, would produce an automatic increase in take-up rates, lower income individuals could file for a hardship exemption from carrying health insurance. Despite concerns over low take-up rates, early studies suggested that Medicaid expansion would succeed in reducing uninsured rates (Graves, 2012; Kenney et al., 2012; Price & Eibner, 2013).

In addition to projections regarding enrollment, there were pre-ACA studies that explored the effects of Medicaid expansion on health care spending. One of these studies examined outcomes from the Oregon Health Insurance Experiment. In 2008, the state of Oregon used a lottery system to randomly provide low-income people not previously eligible for Medicaid with the opportunity to access Medicaid. Those who were not

assigned to Medicaid became the control group. Although the new Medicaid recipients reported improved health outcomes, emergency department (ED) visits increased by 40% in the first 15 months after they received access to Medicaid compared to the control group (Taubman, Allen, Wright, Baicker, & Finkelstein, 2014). Several studies conducted by the Kaiser Commission on Medicaid, the Center on Budget & Policy Priorities, and The Commonwealth Fund projected higher Medicaid-related costs if states were to choose expansion, but also lower uncompensated care costs (Angeles, 2012; Glied & Ma, 2013; Holahan et al., 2012). Moreover, taxpayers in states that did not expand Medicaid still had to pay federal taxes that supported expansion in other states while residents of their own state did not realize benefits (Glied & Ma, 2013).

2.4 First Year Evaluations of Medicaid Expansion

First year studies of Medicaid expansion examined 2014 data, the first year in which Medicaid expansion took place. Expansion states were better off compared to non-expansion states in terms of enrollment, economic outcomes, screenings, and coverage of minority populations.

States that chose to expand Medicaid reported lower rates of uninsured than states that chose not to expand (Cohen & Martinez, 2014; Courtemanche, Marton, Ukert, Yelowitz, & Zapata, 2016; DiPietro, Artiga, & Gates, 2014; Sommers, Gunja, Finegold, & Musco, 2015). However, even states that did not expand increased enrollment in Medicaid, because the previously eligible began to enroll. It is possible that the increased media coverage of Medicaid expansion induced those who had been eligible but never applied to 'come out of the woodwork' for coverage-- "woodwork effect" (Frean, Gruber, & Sommers, 2017).

There were economic effects of expanding Medicaid; two primary findings pertained to "churning" and Medicaid waivers. Churning refers to constant changes in Medicaid eligibility due to changes in income. In expansion states, individuals would vacillate between Medicaid and subsidized HIM plans; in non-expansion states, increases in income could result in ineligibility for Medicaid coverage and for HIM subsidies. Churning was expected to affect 40% of those eligible for Medicaid or subsidized HIM coverage in Medicaid expansion states (Sommers, Graves, Swartz, & Rosenbaum, 2014a). These interruptions in coverage can lead to increased hospitalization, ED use, and poorer quality of care (Carlson, DeVoe, & Wright, 2006; Sommers, Gourevitch, Maylone, Blendon, & Epstein, 2016b). In terms of Medicaid waivers, expansion states outperformed non-expansion and waiver states. Medicaid waivers allowed states to implement Medicaid expansion in ways that differed from those outlined in the ACA (Musumeci, Rudowitz, Ubri, & Hinton, 2017). States that obtained waivers expanded Medicaid, but often with some caveats; for example, many of these waiver-expansion states required cost-sharing of recipients (Baker & Hunt, 2016). A first-year study comparing Texas (no expansion), Arkansas (Medicaid waiver), and Kentucky (ACA Medicaid expansion), found that both expansion states (Kentucky and Arkansas) achieved similar decreases in the number of uninsured in their states, but Kentucky reported lower rates of residents who had trouble paying medical bills (Sommers, Blendon, & Orav, 2016a).

Expansion states also reported more screenings, diagnoses, and care for those with chronic illnesses than non-expansion states (Sommers et al., 2016a). Importantly, improved screenings can lead to early diagnoses and better health outcomes (Cardinale et

al., 2015; Carter et al., 2013; Daniels, Halladay, Shih, Elder, & Dawson, 2014). In states

that expanded Medicaid there was a 23% increase in diabetes diagnoses in 2014

compared to the previous year, women were more likely to receive mammograms or pap

smears, and those with health insurance were more likely to visit a general practitioner

(Kaufman, Chen, Fonseca, & McPhaul, 2015; Sabik, Tarazi, & Bradley, 2015; Wherry &

Miller, 2016). Medicaid expansion states also experienced increases in early diagnoses of

colorectal cancer from 2011-2013 (Lissenden & Yao, 2017). Additionally, there was

improved quality of care for patients at federally funded health centers in Medicaid

expansion states according to a study from 2011–2014, when quality was measured as

improvements in asthma treatment, pap testing, BMI assessment, and hypertension

control (Cole, Galárraga, Wilson, Wright, & Trivedi, 2017).

Vulnerable and marginalized populations also benefited from living in expansion

states. Coverage rates of Hispanics and Blacks were higher in states that expanded

Medicaid than in those that did not, although African Americans were less likely to live

in expansion states (Buchmueller, Levinson, Levy, & Wolfe, 2016). Of the states that

failed to expand Medicaid, many were in the South, which left many African Americans

without access to coverage (Tavernise & Gebeloff, 2013). From another marginalized

segment, those who abuse illicit substances, 32.9% cited cost and lack of insurance as

barriers to access of substance abuse treatment (HHS, 2011). Through Medicaid

expansion, many of those who struggle with abuse and addiction have access to care. For

example, those taking advantage of substance abuse treatment services in Kentucky, an

expansion state, more than doubled from the first quarter of 2014 to the end of the same

year (Healthy Kentucky, 2016). The opioid and heroin crisis is of particular concern to

U.S. public health (Kolodny et al., 2015). In states that expanded Medicaid, there was

also a 70% increase in the opiate drug therapy, buprenorphine compared to states that did

not expand (Wen, Hockenberry, Borders, & Druss, 2017).

2.5 Evaluations of Medicaid Expansion after Year 1

Generally, studies of subsequent years of expansion agreed with earlier findings.

Rates of uninsured remain higher in non-expansion states due to the coverage gap and the

effectiveness of Medicaid expansion in covering the near poor (Garfield & Damico,

2016). In fact, one study demonstrated that between 2014 and 2015, 60% of the ACA's

reduction in the number of uninsured across all states (except Massachusetts) was

attributable to Medicaid expansion; 30% of the 60% increase was from the woodwork

effect (Frean et al., 2017). Coverage of rural populations is also higher in expansion

states (Broaddus, 2017). Economic conditions, access and care, and benefits for

minorities continued to be better in expansion states than in non-expansion states.

The economic benefits of expansion persisted; the cost for uncompensated care

remained lower and each state dollar spent on Medicaid expansion between 2017 and

2026 is forecasted to receive federal matches of $7-$8 (Buettgens, Holahan, & Recht,

2016; Chernew, 2016). A study of 11 Medicaid expansion states found that state-

spending in expansion states grew by half as much as spending in non-expansion states in

2015 compared to 2014 (Bachrach, Boozang, Herring, & Reyneri, 2016). ED visits were

up by less than 3% across all states, regardless of expansion (Pines et al., 2016).

However, there were 31% fewer uncompensated care visits in hospitals of expansion

states (Dranove, Garthwaite, & Ody, 2016). Hospitals were not the only economic

beneficiaries of Medicaid expansion. According to a 2015 study that used fixed-effects

regression to compare boarder-matched counties in expansion and non-expansion states, HIM premiums were 7% lower for consumers in states that expanded Medicaid (Sen & DeLeire, 2016). Finally, although some thought that Medicaid expansion states would experience negative changes in the labor market, significant numbers of individuals did not leave jobs or change to part-time work when they obtained Medicaid coverage (Gooptu et al., 2016; Moriya, Selden, & Simon, 2016).

Although screenings, diagnoses, and quality were examined during the first OEP, access to, utilization of, and satisfaction with care were studied more intensively in subsequent years. Quality care reports remained higher in expansion states. A three year study of Kentucky, Arkansas, and Texas revealed that in expansion states (Kentucky and Arkansas), access to primary care was up 12.1% while ED use and skipping medication were down (Sommers, Maylone, Blendon, Orav, & Epstein, 2017). Other studies comparing expansion and non-expansion states indicated increases in prescription drug utilization, dental care, primary care visits, (Ghosh, Simon, & Sommers, 2017; Gray, Zink, & Dreyfus, 2016; Nasseh & Vujicic, 2015). In terms of quality of care, 88% of new Medicaid enrollees reported being very or somewhat satisfied with their care (Collins, Gunja, Doty, & Beutel, 2016). Newly eligible Medicaid recipients also reported reduced stress (Hom et al., 2016).

The vulnerable and minority populations continued to have improved outcomes in expansion states. In Kentucky—an expansion state--use of substance abuse treatment increased by 740% between 2014 and 2016 (Healthy Kentucky, 2016). Expansion states also had lower rates of unmet mental health and substance abuse treatments (Wen, Druss, & Cummings, 2015). One population that generally struggles with behavioral health

issues, the homeless, also had higher rates of health access and utilization (DiPietro et al., 2014). Regarding the effect of Medicaid expansion on minorities, coverage rates for Hispanics and Blacks are lower in non-expansion states (Garfield & Damico, 2016). Specifically, 1.7 million non-Whites in non-expansion states were left in the insurance coverage gap with incomes too low to purchase coverage on the HIM and too high to qualify for non-expanded Medicaid; roughly 25% of them were Black (Artiga, Damico, & Garfield, 2015). Another study goes beyond just reporting coverage to link those numbers to the consequences of not having coverage. Breathett and colleagues (2017) discovered that there was a 30% increase in the number of African Americans placed on heart transplant listings in early-adopter Medicaid expansion states compared to those in non-expansion states between 2012 and 2015 (Breathett et al., 2017). However, there was no significant increase in the number of Hispanics or Caucasians on those same transplant lists in Medicaid expansion states (Breathett et al., 2017). Although several ACA studies focused on 2014 and 2015, a multi-year study of three states from 2012-2016 found that coverage expansion increased primary care visits, screenings, and overall satisfaction with care (Sommers et al., 2017; Wherry & Miller, 2016).

Findings in subsequent years echo those of first year evaluations. There is a great deal of support for Medicaid expansion in terms of decreasing uninsured rates, saving states money, improving diagnoses and quality care while reducing health care disparities. Studies of additional years should be able to demonstrate long-term cost savings of expansion.

2.6 The Decision Regarding Type of HIM

State legislatures had to choose whether or not to implement their own HIM, allow the federal government to run one in their state, or create a partnership of the two.[1] States were influenced by economic and political factors when making their choice. The HIM decision would influence the website that consumers would use and the training consumer assisters would receive.

State decisions regarding whether to implement a SBM, SPM, or FFM may have been based on economic considerations. Although several grants were available to SPMs and SBMs for implementation, the states had to demonstrate that their HIMs would become self-sustaining. The projected annual costs for SBMs ranged from $15 million in Vermont to $400 million in California (Cole et al., 2016). In order to fund SBMs, the majority of these states chose to assess user fees on individual plans, 8 states on HIM plans only and 5 states on both exchange and off-exchange plans (Dash, Giovannelli, Lucia, & Miskell, 2014).

There were also political reasons influencing the type of HIM that states chose to implement. Of the 16 states and the District of Columbia (D.C.) that implemented SBMs, only 4 of them had Republican governors (California, New Mexico, Nevada, and Idaho) (Jones, Bradley, & Oberlander, 2014). Although states could maintain greater control over health insurance by creating a SBM, many Republican lawmakers explained their inaction on the grounds that they were awaiting Supreme Court decisions that they hoped

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[1]*There are several types of partnership states; those that conduct most core functions but use healthcare.gov, those that operate individual markets while the federal government runs the SHOP, and those that share responsibilities with the federal government but use their own websites for enrollment. In this paper, SBMs refer to marketplaces that use their own website and not healthcare.gov.*

would overturn the new law altogether (Jones et al., 2014). The very rhetoric surrounding decisions about ACA implementation further politicized the issues. As late as January 2017, 35% of Americans did not understand that the ACA and Obamacare were the same law (Dropp & Nyhan, 2017). Some people were fearful that the ACA was government insurance, one step closer to single-payer (Demirjian, 2013; Moffit & Haislmaier, 2013). Others were concerned that their physicians may not accept ACA insurance, and early reports suggested that some doctors were not agreeing to the lower reimbursement rates provided by insurance companies (Cohen, 2014).

2.7 Pre-HIM Projections

Although SBMs required a great deal of planning to implement, several experts believed that SBMs would become increasingly popular, especially because of the amount of control over HIMs they gave to the states (Jones & Greer, 2013). SBMs were predicted to outperform FFMs because of the perception that FFM states were seeking to undermine the ACA (Jones & Greer, 2013). For the first OEP, 37 states decided to use the FFM website healthcare.gov for individual HIM enrollment, and 14 had their own websites (Dash et al., 2013)

2.8 First Year of HIM Enrollment Evaluations

During the first year of enrollment, SBMs were reported to meet a greater percentage of predicted enrollment than FFMs (Blumberg et al., 2014). Many first year studies investigated why SBMs outperformed FFMs in this respect by considering the basic functions of all HIMs: website enrollment, consumer assistance, and plan management (Fernandez & Mach, 2013).

SBM websites offered features to consumers that were not available via the FFM website. One of these differences was the ability to filter insurance plans based on individual need (Cousart et al., 2015). For example, the Massachusetts website offered a filter that would help individuals think about the average amount they spent on health care before choosing a plan (DeBor & Turisco, 2013). Many SBM websites also allowed consumers to view plans with minimal steps compared to almost four times as many steps when using healthcare.gov (Coleman, 2013). Even the name of a HIM website was important. In Kentucky, residents reported being glad that they were able to enroll via Kynect, the state's SBM, rather than Obamacare (Cherkis, 2013).

Consumer assisters were created to aid individuals enrolling for health insurance, a necessary provision given that only 51% of Americans were able to calculate out-of-pocket costs for a hospital stay with deductible and copay (Norton, Hamel, & Brodie, 2014). Consumer assister programs reported that the majority of those they helped enroll were uninsured and did not understand the choices provided to them (Pollitz, Tolbert, & Ma, 2014b). Minorities were the least likely to understand the basics of insurance; Latinos reported the lowest rate of awareness regarding the ACA (Garcia Mosqueira, Hua, & Sommers, 2015; Long, Kenney, Zuckerman, Goin, Wissoker, Blavin,… & Hemsstead, 2013). HIMs with greater consumer assistance funding reported higher rates of enrollment; SBMs accounted for 50% of assister spending even though they only housed 31% of the uninsured (Polsky et al., 2014). On average, SBMs spent $20.57 in consumer assistance per uninsured while FFMs spent $5.90 per uninsured (Holahan et al., 2014). Many SBMs also created training programs for assisters well before the first OEP

and provided them with opportunities to use the website prior to meeting with consumers; such preparation was not always the case in FFMs (Tripp, 2015).

HIM plan management "involves approving qualified health plans and being proactive in contracting with plans in regard to quality targets and premium rates" (Krinn, Karaca-Mandic, & Blewett, 2015, p.162). SBMs had to decide which plan management model to use: active purchaser or clearinghouse. An active purchase model refers to a state that negotiated with insurance companies to provide only the most competitive plans on the HIM. Such selective admission to the HIM can be an important feature, because consumers make less efficient decisions regarding complex choices when presented with too many options (Stanley & Clipsham, 1997; Thaler & Sunstein, 2003; Volk, Touschner, Alker, & Corlette, 2011). When many plans wish to participate, restricting the number of plans competing in a HIM gives state regulators the advantage of rewarding the plans chosen with the expectation of high volumes and attendant scale efficiencies in return for the plans' willingness to accommodate the regulators' wishes in negotiations (Corlette & Volk, 2013). On the other hand, clearinghouse models allowed any insurers with QHPs to participate; all FFMs and SPMs used the clearinghouse model. A study of the first OEP indicated that SBMs with clearinghouse models enrolled the most consumers, even when compared to active purchaser-SBMs, suggesting that a greater number of insurers had a greater impact on enrollment than limiting the number of plans available to consumers (Krinn et al., 2015).

2.9 HIM Enrollment Evaluations after Year 1

Studies of subsequent years focused less on the differences between SBMs and FFMs than did evaluations of the first OEP. After that first year of the ACA, SBMs had

lower rates of uninsured and lower premiums than FFMs (Cole et al., 2016; Gabel et al., 2015). Specifically, from 2014 to 2015, premiums increased in all HIMs, but by only 1.4% in SBMs compared to 6.7% in FFMs (Barker, McBride, Kemper, & Mueller, 2015). A 2016 study found that SBMs with clearinghouse models had more participating insurers and lower premiums (Gabel, et al., 2015; Barker, et al., 2015; Krinn et al., 2015). The majority of ACA evaluations after OEP 1 focused on lower rates of enrollment, decreased competition, and higher premiums/deductibles.

2.9A Enrollment

In terms of decreased enrollment, over half of individuals who did not enroll via the HIMs gave unaffordability as their reason (Corlette, Ahn, Lucia, & Ellison, 2016). Increasingly, individuals eschewed enrollment in favor of paying the penalty for not carrying health insurance (Abelson & Sangor-Katz, 2016; Morrisey, 2016). However, not all individuals were required to pay a penalty if they secured an exemption from coverage. Individual mandate exemptions are granted to many, including those who are incarcerated, are not required to submit a tax return, do not have access to affordable coverage, have religious objections to insurance, or qualify for a hardship exemption (HHS, 2013). The most commonly claimed exemption is for taxpayers who do not have to file tax returns due to low-income (Koskinen, 2017). More taxpayers claimed exemptions in 2016 than the number who enrolled in HIM plans (Koskinen, 2017).

2.9B Competition

As a consequence of decreased enrollment, insurance companies had smaller pools over which to spread health risks. These smaller risk pools indicate increased costs to insurers, since those who most need care are less likely to forego health insurance

(Abelson, 2017). Insurance companies have raised premiums but are incurring greater costs than anticipated; many have already decided to pull out of the HIMs (Hiltzik, 2016). As the insurance market became increasingly concentrated, competition decreased (Mendelson, 2016).

2.9C Premiums

Several studies have highlighted the relationship between the concentration of insurance companies and premium prices: fewer insurance companies yield higher premiums (Blumberg, Holahan, & Wengle, 2016; Gabel et al., 2015; Trish & Herring, 2015). One provision of the ACA increased concentration of health care providers by encouraging the creation of Accountable Care Organizations (ACOs). An ACO is a network of health care organizations that coordinate medical care of patients while sharing financial responsibility (Gold, 2015). ACOs were fostered in an effort to curb health care spending, but many economists worried that ACOs would become monopolistic (Berenson, 2015; Pear, 2011). Although there are no studies tying ACO responsibility to price hikes, studies from both before and after ACA enactment demonstrated how greater hospital market concentration leads to higher premiums (Berenson, 2015; Scheffler, Arnold, Fulton, & Glied, 2016; Sheingold, Nguyen, & Chappel, 2015; Trish & Herring, 2015).

Further research on premium increases since the enactment of the ACA has focused on insurer type. Insurer types refer to plans from national companies, consumer operated and oriented plan programs (co-ops), Medicaid, and integrated plan providers. Integrated plan providers consisted of health care providers who entered the health insurance industry (La Forgia, Maeda, & Banthin, 2017). Integrated plan providers had

modestly lower premiums than those of national plans in 2015 and 2016; Medicaid plans had the lowest per capita costs—a rough equivalent to premiums--in both years (La Forgia, et al., 2017). Although co-ops performed well in 2015 they did not fare as well in 2016, many due to insolvency (Abelson & Goodnough, 2015; La Forgia et al., 2017).

It has been shown that premium price alone is not the sole factor determining consumer choice of a health insurance plan. For example, an increase in premiums alone does not necessarily signal lower rates of enrollment. The clarity of the price signal undoubtedly diminished by the fact that 80% of HIM enrollees received premium tax credits that reduce premiums by 76% on average, thereby reducing the real cost of premium increases for most who purchase on the HIM (Burke, Misra, & Sheingold, 2014). Furthermore, many individuals who purchased HIM plans in OEP 1 re-enrolled in their current plans rather than search for more affordable options in subsequent OEPs (Ericson, Kingsdale, Layton, & Sacarny, 2017). According to the HHS, healthcare.gov enrollees saved an average of $400 in annual premium payments by switching plans in the 2nd OEP. For those who chose not to shop for options, any state using the healthcare.gov template automatically re-enrolled consumers in their previous insurance plan (Goodell, 2014). Some SBMs followed suit while others like Rhode Island required that individuals re-enroll to access subsidies (Goodell, 2014).

However, premiums alone were not the only cost factors that influence enrollment decisions. Prior to the ACA, the RAND health insurance experiment indicated that more generous plans, those with low patient cost-sharing and rich benefits, induced more health costs (Brook et al., 2006). The prevalence of high-deductible plans is increasing with 90% of HIM enrollees enrolled in such plans (Dolan, 2016). Higher deductible plans

are generally chosen by those who utilize fewer services, thus reducing the use of care

(Dolan, 2016). Although the HIM attempts to overcome adverse selection-- cherry-

picking health consumers and avoiding enrollment of the sick--insurers have found other

ways to identify high-risk individuals. Despite the 3 Rs, there was evidence that insurers

increased cost-sharing for high-risk enrollees, a measure which would have reduced

utilization of services among that population (RAND, 2006). Studies have indicated how

52% of HIM plans that cover specialty medications for chronic illnesses like HIV were

associated with higher out-of-pocket costs to the policy holders (Geruso, Layton, &

Prinz, 2016; Jacobs & Sommers, 2015; Pearson, 2014). Specifically, for consumers with

plan formularies that charged greater than 30% copayments or coinsurance for a

commonly-prescribed HIV drug, enrollees paid an average annual cost per drug that was

triple the amount that enrollees in other plans paid (Jacobs & Sommers, 2015). If

enrollees have coverage but lack affordable access to care, these individuals may be less

inclined to enroll in the HIMs.

2.10 Gaps in the Literature

Enrollment has often been the primary dependent variable of the studies of HIMs

mentioned in this literature review. While several studies investigated enrollment rates,

none examined how well HIMs performed in enrolling the uninsured in all HIMs over

multiple years. Reduction of the number of those without health insurance rather than

enrollment numbers per se is the primary focus of HIMs. And as the number of insurers,

types of insurers, and risk mitigation factors that stabilize premiums change, examining

multiple years of HIM enrollment of the uninsured becomes increasingly important.

HIM studies of enrollment tended to focus on comparisons among states. A few studies examined GRAs; however, an insurer does not have to offer the same number of plans in all counties housed within a rating area. A more detailed picture would have emerged if previous studies had drilled down to the county level. One study investigated county level data without using multilevel models and instead resorted to running regression models with fixed- effects (Sen & DeLeire, 2016). The problem with fixed-effects models is that it is not possible to parse the effects due to group characteristics. Without a multilevel model, researchers will make the mistake of drawing inferences about states based on county-level data, because they will be unable to distinguish between different effects of the state and its counties. Multilevel models provide a superior approach to these complex problems, because they account for the effects of both individual and group level variables.

Three OEPs were examined in this dissertation. The first OEP was from October 1, 2013 through March 31, 2014, the second was from November 15, 2014 to February 15, 2015, and the third OEP was from November 1, 2015 until January 31, 2016. Some state marketplaces have had higher levels of enrollment than other states. But why have some marketplaces fared better than others? Studies failed to examine the effect of the marketplace on enrollment of the previously uninsured. Therefore, my first research question is what state level variables, external to the marketplace, influenced enrollment of the uninsured in the first three OEPs? The next question examines the mechanisms internal to the HIM that might contribute to higher levels of uninsured enrollment, while it simultaneously tests a conceptual framework for understanding component functions of the enrollment process. It is particularly notable that the enrollment function has

remained a "black box," whose workings few studies have examined. The research

reported in the remaining chapters goes inside that black box to look at various

components of the enrollment process in ACA federally-facilitated markets. The research

design allows the study to test the validity of an a priori conceptual framework in the

health services literature that was proposed as a guide to understanding the enrollment

process.

CHAPTER 3: METHODS

3.1 Introduction

This chapter outlines two studies examining HIM enrollment by discussing data collection and analysis methods. The first study investigated 3 years of state-level data to determine external factors that may have influenced enrollment of the uninsured. The second study, using the 3Cs framework, examined county and state level variables to determine internal mechanisms of the HIM that may have influenced uninsured enrollment.

3.2 Research Design

Both studies were quantitative studies. For study 1, a panel study, data regarding the first three OEPs were collected and analyzed using a fractional logit model. All variables that were statistically significant in the initial state-level analysis were then used as controls in the subsequent quantitative multilevel model (MLM). The MLM examined the influence of the 3 Cs on county-level enrollment during the 3rd OEP.

3.3 Data Collection for Study 1

Data were collected at the state level from various sources, described below, and stored in a database using Microsoft Excel. There were 153 observations based on 3 years of data for 50 states and the District of Columbia. Multiple studies reviewed in chapter 1 have examined factors influencing enrollment during the first open enrollment period, but the 3 years of enrollment data for the uninsured used in this study constitute a unique, longer-term evaluation of the ACA (Sommers et al., 2017).

The proportion of the uninsured who enrolled via the HIM was the dependent variable. The numerator of the proportion was the number of individuals who selected a

marketplace plan by the end of the first OEP (October 1, 2013 – March 31, 2014). For the second and third OEPs (November 15, 2014 – February 15, 2015 and November 1, 2015 – January 31, 2016, respectively) the numerator consisted of *new* enrollees who selected HIM plans. The data were obtained from annual reports by the Office of The Assistant Secretary for Planning and Evaluation (ASPE) in the HHS. The denominator of the proportion was the total number of uninsured individuals in the state from the year (vintage) in which OEP began: 2013, 2014, and 2015. These data were obtained from the US Census Bureau's Annual Population Estimates.

In total, five independent variables were examined. These variables were drawn from the literature investigating the impact of state policies on various programs including the ACA. Specifically, the five variables were: marketplace type, Medicaid expansion, dissent, the APTC, and political ideology. The independent variables are discussed in detail below.

Under the ACA states faced two major choices that influenced enrollment: implementation of marketplaces (state-based or federally-based) and expansion of Medicaid (Sommers, Maylone, Nguyen, Blendon, & Epstein, 2015). The "type" measured whether the state ran its own HIM or used a federally-facilitated structure. While there were several types of partnership HIMs that existed between several states and the federal government, the primary interest was whether the state used its own website or healthcare.gov to enroll consumers. Therefore, marketplace type was coded as 0 for a federally-facilitated website or 1 if the state used its own virtual platform. Hypothesis 1a states that the type of marketplace would influence HIM enrollment.

Medicaid expansion was coded as 0 for non-expansion and 1 for expansion. Hypothesis 1b claims that states with Medicaid expansion would have an effect on HIM enrollment.

State government maintained a great deal of oversight of enrollment efforts of both state agencies and consumer assisters, even in those states that left organizing its marketplace to the federal government. In fact, some states passed legislation that restricted the efforts of the two groups (Sommers et al., 2015; Rigby, 2012). To measure such legislation, a collapsed variable was employed to measure state dissent. If a state imposed barriers by adding its own stipulations on service as a consumer assister on top of the federal requirements *or* prohibited state agencies from assisting in enrollment efforts, dissent was coded as 1. If the state imposed *both* kinds of restrictions, the state was coded as 2. States without such legislation were coded as 0. The data were collected from the National Conference of State Legislators. Hypothesis 1c claims that such legislation would influence HIM enrollment of the uninsured.

Soss & Keiser (2006) discussed how programs can be influenced by state factors like the generosity of public assistance and political ideology. Financial generosity was measured by the average APTC. APTC is calculated by first determining the cost of the second-lowest silver plan in the individuals GRA. Next, one's age, family size, and percentage of income (relative to FPL) are considered. This personal information yields the percent of income for which the individual is responsible; the difference between the second-lowest cost silver plan and the personal responsibility of the individual is the APTC. Because lower prices result in greater quantity demanded, hypothesis 1d investigates whether average APTC would result in changes to enrollment.

There are several possible measures of ideology. One study estimated a measure called "party elite ideology" in which they determined a party's strength during a set time period based on the ideologies of certain key political actors (Erikson, Wright, & McIver, 1993). The data are not available for the years of interest in this study; however, another similar study examined party composition of state legislatures/governors (Berry, Ringquist, Fording, & Hanson, 1998). Political ideology data were collected regarding the party of the governor and the majority party of the legislature from the National Conference of State Legislators' annual state and legislative partisan composition (Berry & Berry, 1992; Brown, 1995). The data were collapsed into one category. Democratic governor and majority control of both legislative chambers were coded as 0, 1 indicated opposition party control of 1 legislative chamber and/or governorship, and 2 indicated Republican control of both legislative chambers and governorship. Hypothesis 1e states that the ideology of a state will affect HIM enrollment of the uninsured.

However, the variables measuring dissent and Medicaid expansion may also serve as measures of ideology. In an article about the ACA, Rigby (2012) contended that state resistance was actually a measure of government ideology. She demonstrated how state lawsuits, oppositional legislation, and the refusal of federal funding were good measures of ideology (Rigby, 2012). However, in subsequent OEPs, there were no state lawsuits and no federal funds for implementation. Thus, data for the dissent variable were based on legislation, which appeared to be a sounder measure of ideology and one that applied to all three study years. In terms of using Medicaid expansion, Jacobs and Callaghan (2013) demonstrated empirically how expanding Medicaid can serve as a

measure of government ideology. Both dissent and "medicaid" were considered as

possible redundancies in the analysis.

In terms of control variables, socioeconomic variables were factors of enrollment

in HIM plans (Soss & Keiser, 2006). Three final variables were added to the model to

capture additional demographics that contribute to health literacy, according to the Office

of Disease Prevention and Health Promotion (HHS, 2014). Specifically, data were

collected on race, sex, and age of citizens in each state from the U.S. Census Bureau's

American Community Survey estimates. Race is measured by the percentage of the

White population. Sex is the percentage male for each state. Age consists of the

percentage of the population 65 years of age and older, since those over 65 are not

eligible to enroll via HIMs. Therefore, the percentages for individuals: living below

poverty, 25 or older with less than a HS diploma/equivalent, and over 5 years of age who

do not speak English well at home, were also added to the database.

3.4 Data Analysis for Study 1

The following analysis was conducted using STATA 14 on panel data (n=153).

The dependent variable was a proportion bounded by 0 and 1. Due to the nature of the

dependent variable—bounded by 0 and 1—ordinary least squares (OLS) regression was

not appropriate, because it violated the assumption of normality. To demonstrate this

problem, see the Shapiro-Wilk test (Table 3-1), and a kernel density graph (Figure 3-1).

The Shapiro-Wilk test indicated that one can reject the null hypothesis that the

distribution is normal. The kernel density graph approximates a distribution with a

positive skew.

Table 3-1 Shapiro-Wilk Test

```
swilk dv

            Shapiro-Wilk W test for normal data

Variable  |      Obs         W         V         z       Prob>z

      dv  |      153     0.77569    26.547    7.441     0.00000
```
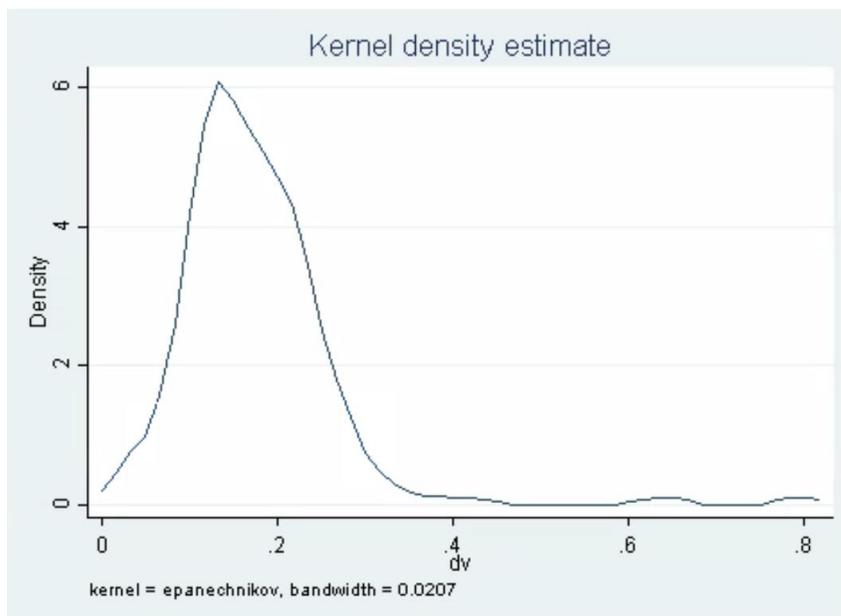

Figure 3-1 Kernel Density Graph of Study 1 dependent variable

A logistic regression was also deemed inappropriate because enrollment was measured as a proportion and not a binary outcome. A beta regression was considered since it may be used when the outcome values are not equal to the limits (0 and 1 in this instance); however, the data were not shoved to the floor (Hardin & Hilbe, 2007; Liu & Xin, 2014). Instead, a generalized linear model (GLM) with a logit link function, also called a fractional logit model, was used to model the data (McCullagh & Nelder, 1989; Papke & Wooldridge, 1993).

Fractional response regression implements quasi-likelihood estimators and fits

regression for the mean of y conditional on x (E(y|x). "…under the assumption E(Y|X) =

G (X`β) = 1 / [1 + EXP (-X`β)], the fractional logit model has the identical likelihood

function F(Y) = G (X`β)$^Y$ = (1-G(X`β))$^{1-Y}$ *for* 1≥Y≥0" (Liu & Xin, 2014, p.8). Before

running the model, a summary of all variables was compiled (Table 3-2) with conversion

of party control and dissent measures to dummy variables (Table 3-3). Variables were

tested for high levels of multicollinearity using the variance inflation factor (VIF) and

calculating correlations for all variables (Tables 3-4 & 3-5). Educational attainment was

highly correlated with the percentage of the population living below poverty and had the

highest VIF score. Three models were run: one for each variable and then one with both

together; those results are discussed in the chapter on findings along with the goodness of

fit tests for the models.

Table 3-2 Summary of Study 1 Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Enrollment	153	0.175	0.091	0.021	0.7977
Type	153	0.275	0.448	0.000	1
Age	153	0.140	0.017	0.082	0.186
Race	153	0.768	0.148	0.250	0.952
Sex	153	0.494	0.008	0.473	0.5238
Educational Attainment	153	0.121	0.032	0.072	0.1888
Below Poverty	153	0.148	0.031	0.087	0.227
Limited English Proficiency	153	0.057	0.040	0.008	0.194
Average APTC	153	274.614	72.718	158.000	750
Medicaid Expansion	153	0.601	0.491	0.000	1
Party Control	153	0.980	0.730	0.000	2
Dissent	153	0.340	0.575	0.000	2

Table 3-3 Study 1 Dummy variables

Party Control	Coded	Frequency	Percent
Democrat	0	42	27
Mixed	1	72	47
Republican	2	39	25
Total	--	153	100

Dissent	Coded	Frequency	Percent
None	0	109	71
1 law passed	1	36	24
Both laws passed	2	8	5
Total	--	153	100

Table 3-4 Variance Inflation Factors of Study 1 Variables

Variable	VIF
Educational Attainment	4.99
Below Poverty	3.92
Limited English Proficiency	2.26
Sex	1.95
Type	1.76
Age	1.45
Medicaid Expansion	1.45
Average APTC	1.39
Race	1.37
Party Control	1.25
Dissent	1.23

Table 3-5 Correlation Matrix of Highly Correlated Study 1 Variables

Variables	Educational Attainment
Below Poverty	0.765

It was also necessary to control for serial and spatial correlation in the model to control for the lack of independence between the error terms. For autocorrelation, all data belong to time period 1, 2, or 3 (OEP1, OEP2, or OEP3, respectively). Fixed effects were

applied to time. For spatial correlation, the data are clustered by the state to which they

belonged using the Huber/White sandwich estimator, which applied robust standard

errors to the model. Because this is the first study to test the utility of the 3Cs framework,

all hypotheses employed two-tailed tests with an alpha level set to .05.

3.5 Data Collection for Study 2

Data were collected at both the county and state levels for OEP3 from various

sources and stored in a database using Microsoft Excel. Data were collected on all

counties in federally-facilitated marketplaces and most counties in 5 state-run HIMs.[2]

This study is unique in that it is the first to test the 3 Cs theory concerning the enrollment

of the uninsured. Controls for the study were pulled from the statistically significant

findings in study 1.

The dependent variable was enrollment. Enrollment was measured using data

from a few different sources. For the numerator, the number of individuals who selected a

plan via the HIM for OEP3 was multiplied by the percentage of people who were new

enrollees in OEP3. The data were pulled from ASPE. For the denominator, the

percentage of the uninsured for 2015 was multiplied by the population of each county in

2015. The data on the uninsured was from Enroll America and population statistics were

drawn from the US Census Bureau.

Independent variables of interest for this study were commoditization,

competition, and communication, the three elements of the 3Cs. [3] The 3Cs is a framework

_____

[2] *Independent cities in Virginia were included as counties because data pertaining to HIM enrollment was available on these 41 areas.*
[3] *Initially, Brandon and Carnes (2015) used the term "commodification" rather than "commoditization," but this paper regards the second word as more appropriate. "Commodification" can usefully be reserved to describe goods that become increasingly unique (Goss, 2013).*

that can aid in understanding the process of enrollment via the HIMs (Brandon & Carnes, 2014). This first empirical test of the framework is exploratory, especially given the difficulty in operationalizing the 3Cs. Therefore, it would be premature to specify the requirements of a successful typology. Instead, findings suggest possible improvements to the measures and modifications of the 3Cs for subsequent studies.

3.5A Commoditization

Commoditization refers to the uniformity of a product that allows consumers to easily compare items. Without commoditization, buyers can have a difficult time deciding between health insurance plans. Sellers want to offer unique products so that they can corner the market, or at least define a market niche that they can dominate, thereby maximizing profits. To address this potential problem, volume 77 of Federal Register Code 8668 required insurers during the first open enrollment period to provide summaries of benefits and costs (SBCs) using a standardized template with specific language. While insurance companies complied with this regulation via the marketplace, other important policy details were not available for side-by-side comparisons on healthcare.gov. For more specific information, one had to visit the various insurers' websites (Tripp, 2015). More uniform directives from government agencies could further improve commoditization, thereby improving competitive efforts as well.

To measure commoditization, data were pulled from the 2016 Clear Choices health insurance exchange scorecard (Appendix A). Clear Choices was founded by the Council for Affordable Health Coverage with the mission of increasing health care transparency to support informed consumer decision-making. The three individuals who developed the scorecard are professional health policy analysts and advisors. The

scorecard compared HIMs in 13 SBMs to the healthcare.gov website used by FFMs and SPMs. Variables included on the scorecard were those that research suggests help consumers make informed online decisions (Rao, White, & Allen, 2015). The variables that would pertain to commoditization fell under the scorecard category of smart, comparative plan displays. The variable names were: smart sort, smart plan finder, and highlighted CSR plans.

Smart sort refers to the default listing of plans according to consumer preferences and out-of-pocket estimates for each plan. Default options can greatly influence decision-making (Johnson, Hershey, Meszaros, & Kunreuther, 1993). Not all HIMs use Smart Sort as a default; other HIMs arranged plans by premiums or yearly cost estimates. For this study, defaults were coded as 1 for smart sort defaults and 0 for defaults based on premiums or yearly cost estimates.

The other two variables were dichotomous yes/no variables and also listed as a state-level variable. The smart plan finder indicated whether or not there is a tool on the website that allowed consumers to prioritize plans based on personal filters. The last variable referenced whether the website flagged plans with tax benefits when consumers were eligible for assistance. These variables were collapsed into one categorical variable numbered 0 (no measures of commoditization) to 3 (all of the commoditization tools). Hypothesis 2a states that commoditization would affect HIM enrollment.

3.5B Competition

In a competitive market, Smithian economics suggests that the price achieved will be the lowest that suppliers can offer and still maintain their businesses. Under the ACA, QHPs were required to offer minimum essential benefits for all plans and any

additional requirements of the HIMs. Then plans at each metal level were required to offer the same actuarial value. The homogeneity of these plans and the manner in which they were presented attempted to encourage competition and thereby lower prices. As the prices decrease, the expectation is that the number of people enrolling should increase.

Competition as a variable in this study was operationalized by data pertaining to: the number of insurers per county, the number of plans per county, and the health insurance market concentration per county. The number of insures and plans were collected from Data.Healthcare.gov's 2016 QHP Landscape Individual Market Medical files. Health insurance market concentration was calculated using the Herfindahl-Hischman Index (HHI). Although each county received a HHI score, there are only three numbers within the range of 0-10000 that are useful in analysis. Scores less than 1500 represent a competitive market, scores from 1500-2500 represent moderately concentrated markets, and scores greater than 2500 indicate a highly concentrated market (USDOJ, 2015). A score of 0 indicated a competitive market, 1 was equivalent to a moderately concentrated market, and 2 represented a highly concentrated market. Data pertaining to SBMs have been collected from various reports released by those states. There are 3 hypotheses pertaining to competition:

- The number of insurers will affect HIM enrollment (2b),

- The number of plans will affect HIM enrollment (2c),

- HHI scores will yield different levels of enrollment (2d).

3.5C Communication

Clear communication of health insurance is important, particularly when health literacy is low and the number of uninsured is high. Even if consumer decision-making is made easy by a high degree of commoditization of the insurance product and multiple insurers are competing against each other, insurance uptake is likely to be low if the ease of enrollment is not effectively communicated to the public. Due to the complex nature of health insurance and the additional technological problems of enrolling via the internet, the ACA creates roles for consumer assistance to help potential enrollees "navigate" the determination of eligibility and the selection of a particular health insurance plan. Often the assisters must also introduce the consumer to the basic concepts of health insurance. There were three primary types of consumer assisters: navigators, in-person assisters (IPAs), and Community Application Counselors (CACs). Consumer assisters have reported that many consumers, the vast majority comprised of the uninsured, needed help understanding the plan choices and lacked the confidence to apply alone (Pollitz et al., 2014b). However, communication was not measured by consumer assistance. Although consumer assistance was found to be integral in helping individuals enroll, this study is focused on *internal* features of the HIM that influenced enrollment of the uninsured (Pollitz, Tolbert et al., 2014).

Communication was operationalized by collecting data from the Clear Choices scorecard report on exchanges. The variables on the scorecard were nominal variables with ratings from A-F and F was used as the reference category (0). The two communication variables were layout and language and were state-level variables, because the functions pertain to the entire statewide marketplace.

Layout referred to the ease of navigating the website. There were five ratings ranging from A (the highest) to F (the lowest). A rating of an A "require[d] minimal clicks from homepage to access the window-shopping tool, and include[d] all of the following items: plain and concise language, a progress bar while entering personal information (if multiple pages), easy-to-follow (walkthrough or hover-over) definitions of key features/terms, and a lack of clutter" (Rao et al., 2015, p. 16). A grade of F meant that the website contained none of these features. Language accessibility referred to the degree of non-English language assistance available. There were 3 possible scores: The A rating indicated that language support was displayed prominently for multiple languages, B indicated that language support was displayed prominently for a single non-English language, and a rating of F indicated zero language assistance for non-English speakers.

Layout and Language were collapsed into one variable. Upon adding the scores of each, only two possibilities remained: a score of 2 or 3. For the binary variable, 2 was coded as 0 and 3 was coded as 1. Hypothesis 2e is that communication will affect HIM enrollment rates of the uninsured. The control variables that were used were those variables that were statistically significant in study 1. Those variables included: male population, the average premium tax credit, Medicaid expansion, and educational attainment.

3.6 Data Analysis Study 2

The following analysis was conducted using STATA 14 on data for OEP 3 (n=2784) and consisted of data from 43 states. The dependent variable was positively skewed; however, robust standard errors offered enough of a correction so that a linear

regression model could be used (Figure 3-2). The variables were collected from two

levels: county level and state level (Table 3-6).
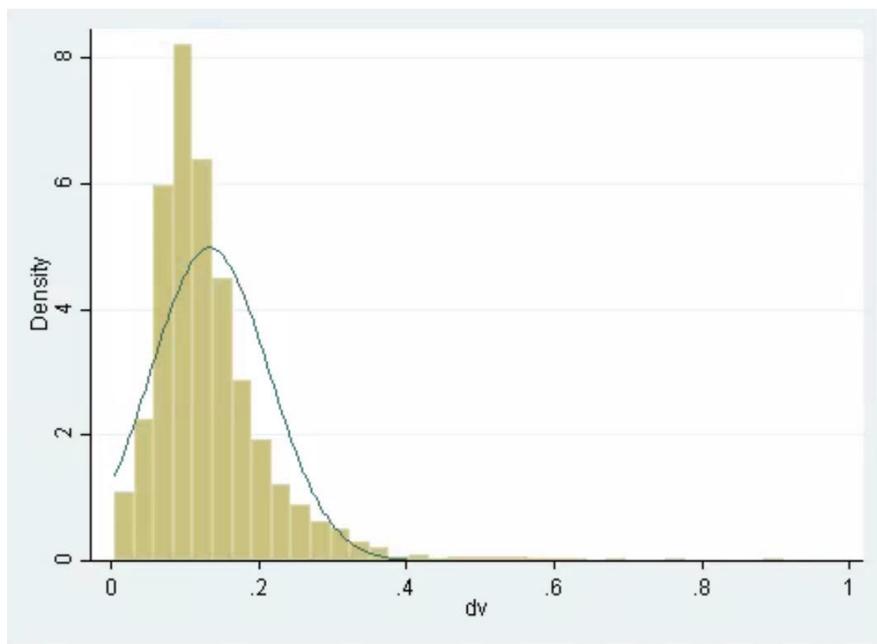
Figure 3-2 Histogram of Study 2 dependent variable

Table 3-6 Summary of Study 2 Variables

Variable	Mean	Std. Dev.	Min	Max
Enrollment	0.135	0.076	0.004	0.911
Plans by County	-0.006	11.350	-53.070	99.493
Insurers by County	-0.001	1.036	-3.819	7.181
Average Insurers by State	3.470	1.323	1.000	7.648
Average Plans by State	35.080	14.138	14.500	76.310
Herfindahl-Hirschman Index	2.390	0.824	1.000	3.000
Commoditization	0.119	0.502	0.000	3.000
Communication	0.969	0.175	0.000	1.000
Medicaid Expansion	0.400	0.491	0.000	1.000
Average APTC	292.813	65.094	183.000	750.000
Sex	0.494	0.006	0.474	0.524
Educational Attainment	0.126	0.033	0.072	0.182

Dummy coding was necessary for several variables (Table 3-7). A correlation matrix was also run to test for high levels of multicollinearity across all variables (Table 3-8). Highly correlated variables, HHI and centered variables, were run in separate models, which generated a better model that will be discussed in the next chapter.

Table 3-7 – Study 2 Dummy Variables

Communication	Coded	Frequency	Percent
English and a second language	0	150	5
More than 2 langauges offered	1	2764	95
Total	--	2914	100
Commoditization			
No tools	0	2726	93
1 tool	1	87	3
2 tools	2	44	2
3 tools	3	57	2
Total	--	2914	100
Herindahl-Hirschman Index			
Competitive Market	0	35	1
Moderately Concentrated Market	1	380	13
Highly Concentrated Market	2	2513	86
Total	--	2928	100

Table 3-8 Correlation Matrix of Highly Correlated Study 2 Variables

Variables	Herfindahl-Hirschman Index
Insurers	-0.725
Plans	-0.638

Multilevel models—also known as mixed effects or hierarchical linear models—are used for nested data in several different fields (Hox, 2010; Snijders & Bosker, 1999). The model used in this study was a multilevel linear regression model. There were two

levels of data: county level data, represented as level 1 and state level data, represented as level 2. Level 1 is the level of analysis at which the outcome is observed and level 2 is the level at which outcomes are clustered.

The MLM was preferred to aggregating the data for a single-level regression so as to maintain detail and statistical power (Hox, 2010). The MLM was not disaggregated to the county level and run as a single-level regression because ignoring groupings can result in the inability to make contextual inferences and a higher likelihood of Type I errors (Duncan, Jones, & Moon, 1998; Luke, 2004). This is due to the nature of grouped data; they violate the OLS assumptions of independence of observations and homoscedasticity (Hox, 2010). Due to these violations, OLS regression alone was not appropriate since standard errors would be underestimated by that model. Finally, aggregation and disaggregation can result in problems with interpretation in which the unit measured is not the unit used when formulating conclusions. For example, observing group level data and making inferences about individuals is referred to as an ecological fallacy while the reverse scenario is called atomistic fallacy.

Before running the model, centering the lower level variables was necessary because they were potentially correlated with random effects and centering aids in the interpretation of the intercept and slope parameters by parsing out the variance of one variable at both the individual and group levels (Enders & Tofighi, 2007). There are two types of centering: grand mean and group mean. Group mean centering was chosen for the model to indicate whether the influence of X on Y is different at the county (within state) and state (between state) levels (Enders & Tofigihi, 2007). Group mean centering

was calculated by subtracting the means of each level 1 continuous variable from each independent observation within that cluster.

$$y_{ij} = \beta_0 + \beta_1(x_{ij} - \bar{x}_j) + u_{0j} + r_{ij}$$

Both group means (planmeans and insurersmean) and centered variables (plandemean and insurersdemean) were included in the model in the event that random effects were correlated with centered variables; level 2 group means would be where the correlations would lie. HHI codes were not centered because of the difficulty interpreting centered categorical variables.

Determining the goodness of fit for a MLM is an iterative process because they are fit using maximum likelihood estimation. Whereas probability is the chance of observing data given a known population, likelihood is the chance of observing a particular sample given an unknown population (Mendenhall, Beaver, & Beaver, 2012). Maximum likelihood estimators are parameter estimates that maximize the likelihood of finding the data that has already been found (Hox, 2010).

To test which model has the highest likelihood, the likelihood ratio (LR) test is used as a goodness of fit test (Luke, 2004). The LR test is a chi-square test with degrees of freedom equal to the difference between the two models (Hox, 2010). The LR test measures the difference of deviance (-2(log likelihood)) between two models, indicating whether there is a statistically significant difference between them. This process is demonstrated in the chapter on findings in which models with fewer parameters are run against more complex models to determine the best one to represent the data.

CHAPTER 4: FINDINGS AND LIMITATIONS

4.1 Introduction

Chapter 4 presents the findings and limitations for: study 1, a quantitative panel study that investigated the influence of state-level variables on HIM enrollment of the uninsured and study 2, a multilevel model that examined the effects of the 3Cs on HIM enrollment of the uninsured. This chapter determines whether there is support for the hypotheses discussed in chapter 3.

4.2 Findings of Study 1

To contend with the highly correlated variables, educational attainment and poverty, two separate models were generated. One model was run with educational attainment and not with poverty while the second was run with poverty and not educational attainment (Appendices B & C, respectively). Then a model with both variables was generated (Table 4-1). Fractional logit is a type of quasi-maximum likelihood estimation and the Wald chi-square test was implemented to determine which set of parameters made the data most likely (Wooldridge, 2011). The likelihood ratio test was not appropriate due to the use of robust standard errors (STATA 14). The Wald test with the highest score is the best model and, in this instance, was the model that included both educational attainment and poverty (Table 4-1).

Table 4-1 Full Fractional Logit Model for Study 1

	Coefficient	Std. Error*	p-value	95% Confidence Intervals	
Marketplace Type	-0.281	0.165	0.089	-0.605	0.043
Age	5.105	2.774	0.066	-0.332	10.541
Race	1.023	0.522	0.050	0.000	2.045
Sex	-24.269	7.135	0.001	-38.252	-10.286
Educational Attainment	-6.067	2.570	0.018	-11.104	-1.030
Below Poverty	1.499	2.652	0.572	-3.700	6.697
Limited English Proficiency	2.483	1.621	0.126	-0.694	5.660
Average APTC	0.001	0.001	0.019	0.000	0.002
Medicaid Expansion	-0.398	0.086	0.000	-0.566	-0.230
1 measure of dissent	0.027	0.091	0.769	-0.152	0.205
2 measures of dissent	0.063	0.133	0.638	-0.198	0.324
Mixed party control	-0.302	0.202	0.135	-0.699	0.094
Republican party control	-0.370	0.219	0.091	-0.798	0.059
2nd OEP	-0.400	0.107	0.000	-0.610	-0.190
3rd OEP	-0.330	0.109	0.003	-0.543	-0.115
Intercept	9.713	3.671	0.008	2.520	16.907
Observations	153				
Wald chi-square (15)	244.3				

*Standard Errors are robust standard errors.

The next step was to determine which measure of ideology – Medicaid expansion, dissent, and political party control – was the best. Wald test statistics were used here as well. Appendices D, E, and F demonstrate the model with each of the measures and Table 4-1 demonstrates the model with all 3 ideological measures. Although Medicaid expansion was the strongest of the 3 variables, the best model included all measures of ideology.

Once all variables were included in the model, the goodness of fit for the fractional model was compared against the beta regression model (Appendix G) and a

linear model (Appendix H). The full fractional logit model was run and then correlations

between the predicted and actual values of *y* were generated for each model (Table 4-2).

There was a higher correlation between the terms for the fractional logit than for the beta

regression or the linear model, indicating a slightly better fit. Each model had the same

statistically significant variables with only slight differences in their coefficients;

however, because the fractional logit was the better model, findings were based on its

outcomes.

Table 4-2 Predicted Models vs. Actual Model for Study 1

Correlation	HIM enrollment of uninsured
Fractional Logit Model	0.581
Beta Regression Model	0.568
Linear Regression Model	0.563

In terms of interpreting the effects, the coefficients were not clear due to the log-

link used with the fractional model. Therefore, the average partial effects as

recommended by Wooldridge and Papke (1993) were calculated. The average marginal

effects indicated four statistically significant variables, not including time and the

constant term (Table 4-3).

Table 4-3 Average Partial Effects of Study 1

	Coefficient	Std. Errors*	p-value	95% Confidence Interval	
Marketplace type	-0.040	0.024	0.090	-0.086	0.006
Age	0.725	0.394	0.066	-0.047	1.496
Race	0.145	0.075	0.053	-0.002	0.292
Sex	-3.446	1.009	0.001	-5.424	-1.469
Educational Attainment	-0.862	0.365	0.018	-1.576	-0.147
Below Poverty	0.213	0.377	0.572	-0.526	0.951
Limited English Proficiency	0.353	0.231	0.126	-0.100	0.805
Average APTC	0.000	0.000	0.018	0.000	0.000
Medicaid Expansion	-0.057	0.012	0.000	-0.080	-0.033
1 measure of dissent	0.009	0.013	0.769	-0.022	0.029
2 measures of dissent	0.004	0.019	0.637	-0.028	0.046
Mixed party control	-0.043	0.029	0.140	-0.100	0.014
Republican party control	-0.053	0.031	0.095	-0.114	0.009
2nd OEP	-0.058	0.017	0.000	-0.091	-0.026
3rd OEP	-0.049	0.017	0.004	-0.082	-0.016

*Standard Errors are robust

In this study, there were several statistically significant variables, but only two were key explanatory variable and the rest were controls. Medicaid expansion was statistically significant with 5.65% decrease in the proportion of enrollment when compared with states that did not expand. The average APTC p-value of .018 indicated that on average each additional $100 of APTC resulted in an almost 1.9 percentage increase in the proportion of HIM enrollment. In the future, it may be more advantageous to consider the average proportion of APTC out of the average premiums for that state; however, these data for SBMs in the first 3 OEPs were often unavailable. By collecting

uniform data from FFMs and SBMs, CMS would improve future studies of HIMs. There was support for hypotheses 1a and 1d.

Control variables were also statistically significant. The percentage of males in the population indicated that a 1 percent increase in the male population decreased the proportion of enrollment by 344%. After examining the variable, there are no outliers that could be inflating the effect of male population on enrollment; however, the small range by which the male population varied from state to state may have concentrated the effect of sex in this study.

A 1% increase in the percentage of the population with less than a HS diploma (or equivalent) corresponded on average to an 86% decrease in the proportion of uninsured who enrolled via the HIM. Although educational attainment was a statistically significant variable, a measure to gauge an individual's understanding of health insurance would provide more insight into how to best help consumers enroll in health coverage.

Finally, OEPs 2 and 3 enrolled a lower proportion of the uninsured when compared to the first OEP, though OEP 2 had the lowest rates of uninsured enrollment (Figure 4-1). Based on these findings, if studies only investigated the first year of enrollment, they may be unable to assess which variables factor into enrollment decisions in subsequent years. On the other hand, if studies only investigated OEPs 2 and 3, HIM enrollment of the uninsured may seem to have increased. Furthermore, many studies only investigated ACA enrollment overall; however, the primary aim of the ACA was to decrease the rate of the uninsured. Despite lower rates of the uninsured after OEP 1, the U.S. Center for Disease Control reported that 28.6 million people do not have health coverage in 2016 (Cohen, Zimmitti, & Martinez, 2017). In 2017, the uninsured rate

increased for the first time since ACA implementation to 11.3% (Morse, 2017). If

analyses are not conducted on uninsured enrollment over time, they may miss

understanding how insurance is shifting from private coverage to public coverage and the

opportunity to examine how these shifts may change risk pools and sustainability of new

policies.
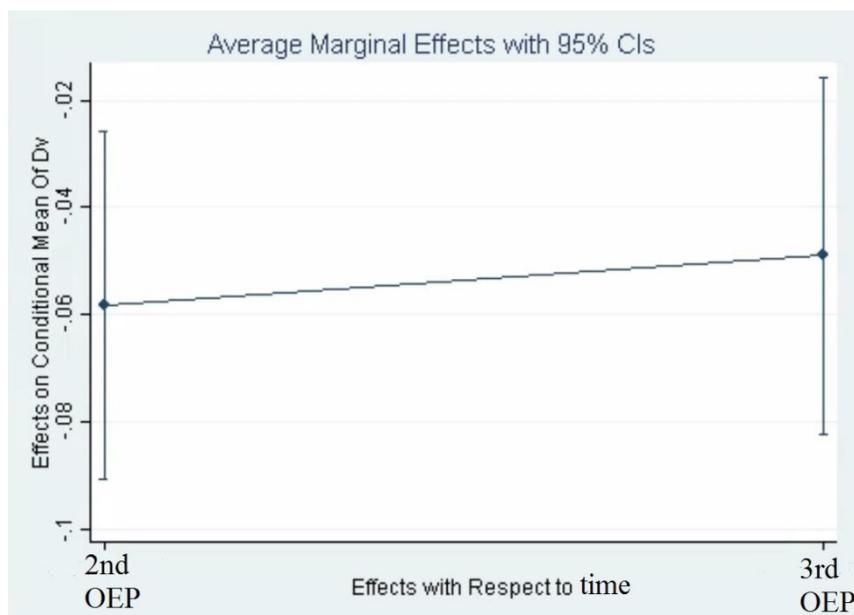
Figure 4-1 – Margins plot of OEPs

    None of the ideological variables, save Medicaid expansion, were statistically

significant. These findings are supported by a study by Callaghan and Jacobs (2017) who

found that partisanship (measured by gubernatorial party and legislative control) does not

exert a dominant influence on enrollment. Early implementation of programs was

influenced by state ideology, but public policy experts should take care to examine

evaluations over several years of implementation (Callaghan & Jacobs, 2017).

    Whether a HIM was state-run or federally-facilitated was not statistically

significant; however, the finding is noteworthy because it suggests that there is more to

virtual enrollment than the entity that manages the website. The state-run HIM had a 3.8% decrease in enrollment compared to the federally-facilitated HIM website, even after controlling for uninsured populations and OEPs. Study 2 will attempt to determine *how* website mechanisms influenced enrollment.

4.3 Limitations of Study 1

There were a few limitations in this study. Although the observations were conducted across 3 OEPs, there were only 153 observations; a larger sample size would yield greater statistical power. Furthermore, the measure of average APTC was used in lieu of average premiums by state because that information for SBMs was not available. Finally, Fording's measure of ideology, mentioned in Chapter 3 was unavailable at the time of this study; it would have been a useful measure to include.

4.4 Findings of Study 2

A MLM was chosen to examine the state and county level functions of a HIM. The null model was generated first (Table 4-4). The null is the MLM without any level 1 or level 2 predictors (below).

$$\text{Level 1: } Y_{ij} = \beta_{0j} + r_{ij}$$

Where Y_{ij} is the percentage of uninsured who enrolled via a HIM.

β_{0j} represents the average enrollment for each state.

r_{ij} is the deviation of county enrollment from the grand mean of all states.

The null model allows for the intraclass correlation coefficient (ICC) to be calculated. The ICC measures deviation in the dependent variable explained by level 2 units. In this case, 45% of variance in uninsured enrollment is explained by between state variability (Table 4-5).

Table 4-4– Null Model for Study 2

	Coefficient	Std. Error	p-value	95% Conf. Interval	
Intercept	0.138	0.009	0.000	0.121	0.154
Random Effects	**Estimate**	**Std. Error**		**95% Conf. Interval**	
State	0.056	0.006		0.045	0.070
County	0.062	0.062		0.060	0.064
Log-likelihood	3897.245				
Observations	2924.000				
Groups	46.000				

Table 4-5 Intraclass Correlation Coefficient for Study 2

Level	ICC	Std. Error	95% Confidence Interval	
State	0.451	0.055	0.347	0.559

To generate a MLM, level 2 variables are substituted for B_{0j}, or the intercept to the level 1 equation. When combined, level 1 and level 2 variables form the single equation model described below.

$$\text{Level 1: } Y_{ij} = \beta_{0j} + r_{ij}$$

$$+$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

Where γ_{00} is the average enrollment for all states (AKA grand mean).

u_{0j} is the deviation of each state from the grand mean.

$$\text{Single equation model: } Y_{ij} = \gamma_{00} + u_{0j} + r_{ij}$$

The single equation model is the summation of level 1 and level 2 equations, substituting level 2 at the level 1 intercept. This mixed effects model can be divided into two parts: the fixed and random effects. In MLMs, random effects are individual level effects that are allowed to vary by group and represent additional error terms in the model. The grand mean, or average enrollment of all states conditional on all the covariates in the model, is represented by γ_{00}. This variable is fixed and does not vary by state; note the absence of the subscript j. The other two variables, error terms for both level 1 (r_{ij}) and level 2 (u_{ij}), represent the county level deviation from grand mean and the state level deviation from the grand mean, respectively (Appendix I).

Two models were run after the null model due to a high level of multicollinearity between HHI scores and the number of plans and insurers. One model was run with HHI scores (Appendix J) and the other was run with the two centered variables and their group means (plans and insurers) (Appendix K). According to the LR test, the model of best fit was the one with the centered variables (Table 4-6). Therefore, HHI scores were not generated in subsequent models.

Next, the model with both HHI scores and centered variables was run (Appendix L). The centered model was run against the model with both HHI scores and centered variables. The LR test indicated that the centered model was a better fit than the model with both variables (Table 4-7).

Table 4-6 LR test between HHI and Centered Variables for Study 2

LR chi2(3)	55.140
Prob>chi2	0.000

Table 4-7 LR test between Full Model and Centered Variables for Study 2

LR chi2(2)	1.880
Prob>chi2	0.391

The final goodness of fit test was to examine whether or not the addition of random effects yielded the better model. The LR test indicated that the model with random effects in which level 1 variables are allowed to vary by group, was the better of the two (Table 4-8).

Table 4-8 LR test between Random Effects and None for Study 2

LR chi2(1)	706.760
Prob>chi2	0.000

After determining which of the correlated variables to drop and deciding to apply random effects, interaction effects were examined. The 3Cs theory indicated that there would be an interaction between communication, commoditization, and competition (Brandon & Carnes, 2014). However, the only statistically significant cross-level interaction effect was the effect between the number of insurers (competition) and state-level commoditization (Table 4-9). The LR test was run against the full model without the interaction effect and with the interaction effect. The LR test indicated a better fit for the model with the interaction effect (Table 4-10).

Table 4-9 Study 2 Model with Interaction Effects

	Coefficient	Std. Error	p-value	95% Conf. Interval	
County Plans	0.000	0.000	0.207	-0.001	0.000
County Insurers	0.012	0.002	0.000	0.008	0.016
Avg. State plans	0.005	0.007	0.533	-0.010	0.019
Avg. State insurers	0.000	0.001	0.761	-0.001	0.001
Medicaid Expansion	-0.036	0.015	0.014	-0.064	-0.007
Avg. APTC	0.000	0.000	0.170	0.000	0.000
Sex	-0.775	1.070	0.469	-2.872	1.323
Educational attainment	-1.265	0.247	0.000	-1.749	-0.781
1 Commoditization tool	-0.083	0.082	0.309	-0.243	0.077
2 Commoditization tools	-0.039	0.030	0.203	-0.098	0.021
3 Commoditization tools	-0.017	0.042	0.688	-0.100	0.066
Communication	-0.011	0.075	0.878	-0.158	0.135
Interaction effect with 1 tool	-0.006	0.009	0.466	-0.025	0.011
Interaction effect with 2 tools	-0.016	0.006	0.011	-0.028	-0.004
Interaction effect with 3 tools	-0.018	0.015	0.234	-0.048	0.012
Intercept	0.731	0.522	0.161	-0.291	1.753

Table 4-10 LR test of Interaction Effects and None in Study 2

LR chi2(3)	8.280
Prob>chi2	0.041

The equation for the full MLM was:

$$Y_{ij} = \gamma_{00} + \gamma_{01}\text{Medicaid} + \gamma_{02}\text{Male} + \gamma_{03}\text{Eduattain} + \gamma_{04}\text{commodify} + \gamma_{05}\text{communicate} +$$

$$\gamma_{06}\text{avgAPTC} + \gamma_{10}(p_{ij} - \text{p-bar}_j) + \gamma_{20}(\text{ins}_{ij} - \text{i-bar}_j) + \text{interactioneffect} + r_{ij} + u_{0j}$$

Table 4-11 Full Multilevel Model for Study 2

	Coefficient	Std. Error*	p-value	95% Conf. Interval	
County Plans	0.000	0.000	0.551	-0.001	0.001
County Insurers	0.012	0.004	0.003	0.004	0.020
Avg. State plans	0.005	0.007	0.538	-0.010	0.019
Avg. State insurers	0.000	0.001	0.752	-0.001	0.001
Medicaid Expansion	-0.036	0.018	0.047	-0.071	0.000
Avg. APTC	0.000	0.000	0.142	0.000	0.000
Sex	-0.775	0.902	0.391	-2.542	0.994
Educational attainment	-1.265	0.195	0.000	-1.647	-0.883
1 Commoditization tool	-0.083	0.023	0.000	-0.128	-0.038
2 Commoditization tools	-0.039	0.020	0.050	-0.077	0.000
3 Commoditization tools	-0.017	0.013	0.207	-0.043	0.009
Communication	-0.011	0.025	0.646	-0.060	0.037
Interaction effect with 1 tool	-0.006	0.003	0.030	-0.013	-0.001
Interaction effect with 2 tools	-0.016	0.003	0.000	-0.022	-0.010
Interaction effect with 3 tools	-0.018	0.003	0.000	-0.022	-0.010
Intercept	0.731	0.412	0.076	-0.025	-0.011
Observations	2784				
Groups	43				
*Standard Errors are robust.					

There were several statistically significant findings with p-values below .05 (Table 4-11). For each additional insurer, county enrollment increased by approximately 1.2% within a state, on average. For level 2 variables of interest, the presence of a default sorting feature, a filter, and highlighted CSR plans enrolled fewer consumers compared to marketplaces with none of these options. One commoditization tool resulted in 8.5% less enrollment while two commoditization tools enrolled 3.6% less, compared to marketplaces with no commoditization tools. The highest number of commoditization tools on a marketplace (3) was not statistically significant. Like the other levels of

commoditization, the sign of the coefficient was negative; however, there was a smaller impact on enrollment (1.8%) than was indicated by the presence of one or two tools. These findings indicate that, although HIMs with no commoditization tools enrolled more of the uninsured than HIMs with commoditization tools, when present, more tools were better for enrollment than fewer tools. There was also a statistically significant cross-level interaction effect between commoditization and the number of insurers at the county level. One additional insurer, or increased competition, attenuates the negative effect of commoditization on enrollment.

Some of the control variables were also statistically significant. In states that expanded Medicaid, enrollment was down by 3.5% compared to states that did not expand Medicaid. This finding is less surprising because as the population of those eligible for Medicaid increases, the population of those eligible to apply via the HIMs decreases. Another statistically significant finding was that for each additional increase in the percentage of those without high school diplomas, the proportion of enrollment fell on average by almost 127%. This finding strengthens the argument that health literacy, generally lower among those with less education, will be a necessary component of efforts to increase HIM enrollment. The random effects of counties and states must also be interpreted. Counties within a state deviated from average state enrollment by almost 6%. State enrollment deviated from the average state enrollment by 3.6%. Additional county level data would be helpful in decreasing the amount of unexplained variation in this level of the model.

To confirm the appropriateness of using a multilevel linear regression model, the residuals were calculated to ensure they had a linear relationship to the fitted values of y (Figure 4-2). There were no extreme outliers and the distribution was close to normal.
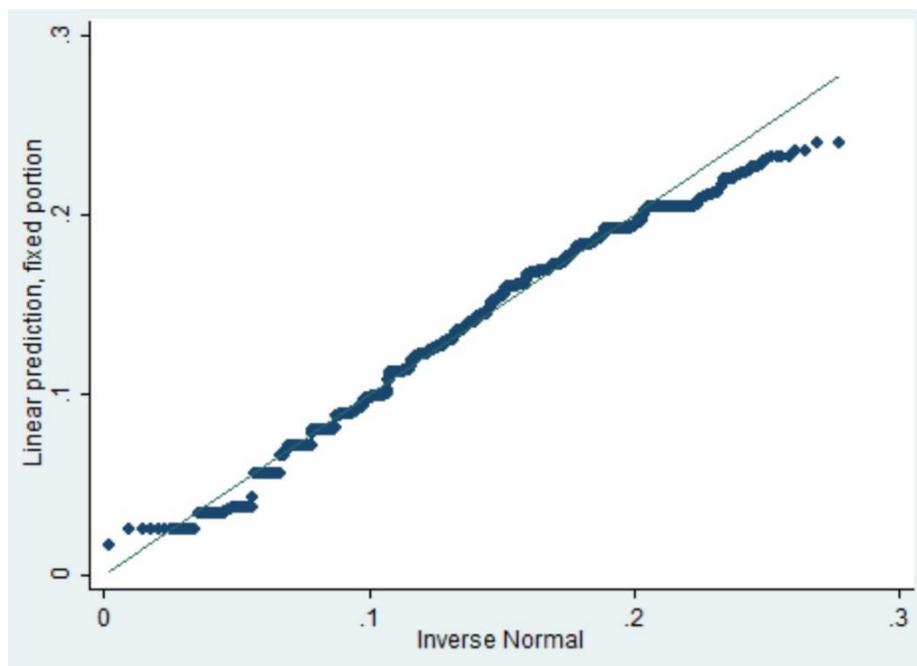
Figure 4-2 Study 2 Residuals vs. Fitted

4.5 Limitations of Study 2

Limitations of this study pertain to the difficulty in obtaining data on SBMs and granularity of data. Thirty-eight states using the FFM website were examined, but only 5 SBMs are reflected in the analyses because not all SBMs made their data available to the public. A larger sample of SBMs would make examination of HIMs more robust. Another limitation of this study is that it is based on only one year of data because CMS did not collect county-level enrollment data until 2015. The last limitation deals with the measures used in this study. While the scorecard measures of commoditization and communication were useful, improved measures would be helpful in future studies.

Specifically, because commoditization tools were collapsed into one variable and communication's layout and language features were collapsed into another (due to a high degree of multicollinearity), this analysis was unable to examine the detailed effects of each.

However, these findings do not undermine the utility of the 3Cs framework for understanding HIM enrollment of the previously uninsured. Increased competition positively influenced enrollment. And although commoditization had a negative effect on enrollment, the problem may not be attributable to the model, but instead to one of the assumptions of the model, health literacy of enrollees. The previously uninsured generally have lower levels of health literacy and, for this reason, may have been confused when comparing HIM plans. Finally, although communication was not statistically significant, that may be because communication does not have a direct relationship with enrollment, but rather an influence on commoditization. These findings will be discussed in greater detail in Chapter 5.

CHAPTER 5: DISCUSSION AND POLICY IMPLICATIONS

5.1 Introduction

      This section will discuss all statistically significant variables for study 1 and for study 2. Key explanatory variables that were not statistically significant but that require comment will also be examined. Policy recommendations will be presented.

5.2 Study 1 Summary of Findings

      There were several significant findings in study 1. Medicaid expansion states had lower levels of uninsured HIM enrollment than states that did not expand Medicaid. States with higher APTC reported higher rates of HIM enrollment. Populations with higher percentages of males and those without a high school diplomas (or equivalent) also had lower rates of enrollment. Additionally, there were several key explanatory variables that were not statistically significant. Marketplace type, dissent, and ideology, were not statistically significant, but these findings may provide insight into previous studies examining these factors during OEP 1. The primary utility of the present study was the assessment of HIM enrollment over time: it clearly demonstrates how policy analysis can benefit from longitudinal studies.

5.3 Discussion of Statistically Significant Findings

5.3A Medicaid Expansion

      States that expanded Medicaid have shown greater reductions in overall uninsured rates compared to states that did not expand (Avery, Finegold, & Whitman, 2016; Sommers et al., 2016b; Sommers et al., 2014b). In addition, expansion states had lower premium rates in HIMs compared to HIMs in non-expansion states (Sen & DeLeire,

2016). A plausible explanation of the lower premiums in expansion states is that

significant proportions of those with incomes between 100-138% FPL chose to be

covered by Medicaid rather than the HIM (Sen & DeLeire, 2016). Because lower-income

individuals tend to have poorer health outcomes compared to those with higher incomes,

their departure from the market for commercial insurance in expansion states would leave

a healthier population in the HIM risk pool and result in lower premiums (Cox et al.,

2016a; Sen & DeLeire, 2016). However, this account does not explain why expansion

states have lower rates of HIM enrollment than non-expansion states. Levitt, Claxton,

Damico, & Cox (2016) suggested that expansion states *might* have lower rates of

marketplace enrollment because those with incomes between 100%-138% FPL are

covered by Medicaid instead. Because the *overall* state uninsured rate in non-expansion

states is higher than in those states opting to expand Medicaid, some suggest that lower

rates of HIM enrollment are not a problem (Jost, 2016). However, supporters of the ACA

need to guard against the long-term effect of the "death spiral" in the HIM. According to

Gabel & Whitmore (2017),

> in a death spiral, a plan or market attracts a disproportionate number of high-
> cost persons, which in turn forces insurers to raise premiums. Healthy persons
> are then disinclined to choose the plan, so medical expenses per person grow
> larger; this leads to higher premiums, which in turn leads to more adverse
> selection. (p. 3)

This cycle repeats until the system is no longer sustainable. Examples of unsustainable

markets may be of concern leading into the 5th OEP beginning in the Fall of 2017 as 45

counties face the possibility of having no insurers that will be offering HIM plans (Park

& Carlsen, 2017). The following paragraphs begin with a discussion of how low enrollment leads to fewer insurers and higher premiums.

In this study, Medicaid expansion states had lower rates of HIM enrollment of the uninsured than in states that chose not to expand. Although there are no coverage gaps in expansion states, healthier individuals may choose not to carry coverage since they need it less and because the penalty to be uninsured is often less expensive than coverage; the penalty is 2.5% of income and only assessed when a federal tax refund is available (Abelson & Sangor-Katz, 2016; Morrisey, 2016; Pear, 2016). Total HIM enrollment, not just of the uninsured, is lower than expected. The Congressional Budget Office projected 2016 total HIM enrollment would be 24 million; however, only 11 million enrolled (Johnson, 2016). Smaller numbers of enrollees shrink the size of the HIM risk pools and can increase costs for insurance companies. These increased costs can make the HIM market less attractive to insurers. From 2016 to 2017, the average number of insurers per county has dropped from 5.3 to 2.9 (AAA, 2017; Pearson, 2014).

Thus, if insurers leave the HIM, higher premium prices and disruptions in coverage are likely to ensue, thereby further decreasing enrollment rates (CMS, 2017b; Jacobs, Banthin, & Trachtman, 2015). In 2017, premiums were forecasted to rise by 22% (Kodjak, 2016). Higher premiums discourage those without financial aid from enrolling or maintaining enrollment; among individuals who canceled their HIM plans prior to paying their first month's premium, 20% cited increasing premiums as the reason (CMS, 2017b). However, premiums seem to affect initial decision-making more than subsequent re-enrollment decisions. For example, researchers found that encouraging Coloradans to shop for new HIM plans in order to secure the best premium rates was successful, but did

not significantly affect the number of consumers who *switched* plans (Ericson et al., 2017). The lack of switching may be due to FFMs automatically re-enrolling consumers in the same plan; this automatic reenrollment can lead to higher costs for consumers (Angeles, 2012; Cox, Claxton, & Levitt, 2015). Obviously, when plans cease to be offered those individuals that they insure must again submit to the lengthy enrollment process. Thus, in 2017 enrollees whose 2016 insurance company was still in the market were more likely to purchase coverage than those who did not have any plans offered by their 2016 insurer (CMS, 2017b).

5.3B Average Premium Tax Credit

In this study, greater average APTCs were indicative of higher rates of uninsured enrollment via the HIMs. Although earlier findings indicated consumer sensitivity to net premiums – premiums after APTC was applied -- a more recent study indicated that percent of subsidy received was more useful at predicting enrollment (Burke et al., 2014; DeLeire & Marks, 2015; Frean et al., 2017). Specifically, Frean et al. (2017) demonstrated how 40% of enrollment was attributable to premium subsidies, with the greatest sensitivity towards percentage of APTC received.

However, a large number of those who are currently uninsured qualify for APTC but are not taking advantage of the financial aid: 52% of the uninsured did not even realize that financial assistance was available (Finegold, Avery, Ghose, & Marks, 2015). This number indicates that a bigger problem than unaffordability may be the *perception* of unaffordability. For example, 19% of the uninsured are eligible for APTC and have not taken advantage of this financial assistance (AAA, 2017). Additionally, in California's individual market, 31% of enrollees missed out on financial assistance by not applying

via the marketplace or not enrolling in silver tier plans (Fung et al., 2017). Regardless of whether premiums increase or not, if people believe that HIM plans are too expensive, they may fail to enroll.

5.4 Statistically Significant Controls for Study 1

In study 1, control variables were related to characteristics of those with low levels of health literacy. Specifically, men and those without a high school diploma have lower rates of health literacy than women or those with higher levels of education (Kutner, Greenburg, Jin, & Paulsen, 2006). Gender and educational attainment were the only statistically significant control variables in this study.

5.4A Male Population

States with higher percentages of men had lower rates of HIM enrollment. In fact, of those who enrolled in HIMs during OEPs 1 and 2, more than half were women (Simmons, Warren, & McClain, 2015). These findings are further supported by literature that reports men are less likely than women to be insured or to use health care services (Galdas, Cheater, & Marshall, 2005; KFF, 2017). However, when they are insured, men are more likely to be insured by their employers than women; access to affordable employer-sponsored coverage would reduce the number of those eligible to apply for subsidies via HIMs (KFF, 2016). Even if men qualify for Medicaid, historically men have not had equal access to the program as have women; therefore, non-elderly men are less likely than women to enroll in Medicaid (Hinton & Artiga, 2016).

5.4B Educational Attainment

States with lower percentages of residents with high school diplomas (or equivalent) also had lower rates of HIM enrollment. Health illiteracy is prevalent among

those with lower levels of education (Clouston, Manganello, & Richards, 2017; DeWalt, Berkman, Sheridan, Lohr, & Pignone, 2004). This may explain why individuals with less than a high school diploma (or equivalent) are more likely to be uninsured (Kaplan, Fang, & Kirby, 2017). Lower levels of health literacy can lead to problems selecting health insurance plans (Long, Shartzer, & Politi, 2014).

5.5 Discussion for Variables not Statistically Significant

Marketplace type, ideology, and dissent were not statistically significant in this analysis despite their significance in early evaluations of the ACA (Fineberg, 2012; Jacobs & Callaghan, 2013; Rigby, 2012). These variables bear mentioning as evidence that multi-year evaluations are important to the understanding of the ACA's long-term impact. In terms of early marketplace studies, SBMs were enrolling a greater percentage of projections than FFMs (Polsky et al., 2014). While SBM websites were considered to be more user-friendly in OEP 1, the FFM improved its website to better assist consumers and enrollment (Coleman, 2013; Leonard, 2014). The website now offers additional features like filters that only display plans that meet consumer criteria (Appendix M). This reduces consumer confusion and should aid in increased enrollment.

A similar picture emerges regarding ideology and dissent. Initial studies of the ACA during the first OEP suggested that these political characteristics were primary drivers of enrollment (Rigby, 2012; Lanford & Quadagno, 2015). There were state generated lawsuits and Supreme Court decisions threatening the ACA implementation as late as 2013. Once the rulings were made, the only way in which states would have been able to influence HIMs was by restricting navigator assistance to consumers. Several states passed legislation prohibiting state agencies from participating in enrollment efforts

and not accepting money to aid with navigator efforts (Wishner, Spencer, & Wengle, 2014). One such state was North Carolina. However, community-based organizations in the state banded together to apply for and receive the fourth largest federal navigator grant in the country (Wishner et al., 2014). In addition, these organizations used one state-wide telephone number that consumers across the state could access to setup appointments for local enrollment assistance (Tripp, 2015). In fact, several high-enrollment states had coordinated assistance programs (Wishner, Hill, Benatar, Gadsden, & Upadhyay, 2015). Fortunately, it seems that federal money distributed to non-profit organizations was able to overcome state-level dissent.

5.6 Study 2 Summary of Findings

There were several significant findings in study 2. Greater competition from increased numbers of insurers increased HIM enrollment of the uninsured. Commoditization tools decreased enrollment compared to HIMs that did not offer them. However, an interaction between commoditization and the number of insurers mitigated the negative effect on enrollment. Some of the control variables were also statistically significant. In states that expanded Medicaid, HIM enrollment was lower when compared to states that did not expand Medicaid. Also, as the population with less than a high school diploma (or equivalent) increased, HIM enrollment decreased.

5.7 Discussion of 3Cs variables

The motivation of Study 2 and therefore its design was in part to apply and test a specific conceptual framework to the real world of enrollment in the health insurance exchanges established by the ACA – the HIM. It is worthwhile reviewing the 3C typology before exploring the empirical findings that constitute a preliminary test of this

conceptual framework. The 3 Cs are commoditization, the need to produce and display products (e.g. health insurance plans) with sufficient similarity to facilitate rational consumer choice among them, competition for subscribers among insurers and their multiple plans, and communication of information about plans and their salient characteristics to potential purchasers during HIM enrollment periods. Thus, the 3C framework provides a picture of how a health insurance exchange such as the HIM is ideally designed to promote consumer utility and curtail growth in health care costs using beneficial competition among insurers. Commoditization seems essential to achieve effective competition among insurance plans, but it is also necessary for the communication of relevant information to the prudent purchaser of health insurance. Similarly, effective competition and communication interact.

The a priori 3C typology was offered by researchers as a guide for framing the complex enrollment process and detecting any hitches in its implementation (Brandon & Carnes, 2014). Previous research has failed to consider the "black box" of enrollment as an integrated process, although some of the literature cited in this dissertation reports research on one or another aspect of it. Study 2 in this dissertation is the first effort to apply this conceptual framework empirically to determine its usefulness. There were 5 hypotheses regarding the 3Cs of competition, commoditization, and communication in Study 2. Of the 5, there was only support for hypotheses 2a and 2b that suggested relationships between commoditization and number of insurers (competition) respectively.

5.7A Competition

There were two variables that represented competition in this model: the number of plans and the number of insurance companies for each county. Although the number of plans was not statistically significant, the number of insurers was. Previous findings have demonstrated how additional insurers yielded decreased premium pricing in their territories and how this price discipline contributed to increased enrollment (Cox et al., 2015). Unfortunately, since 2013, the number of insurers offering plans in HIM counties across the country has decreased (Pearson, 2014). Decreased competition has led to increasing premium prices, up by 22% in 2017 (Kodjak, 2015). However, the consumers who receive subsidies may not notice the rising premiums because financial assistance increases as premiums rise. It will be interesting to see if decreased competition will lead to lower enrollment despite increasing subsidies.

5.7B Commoditization

Commoditization was measured by the use in each HIM of 3 tools to aid consumers in comparing health insurance plans: plan filters, highlighted subsidy offerings, and plans that were sorted on consumer needs instead of premiums. The presence of these tools had a negative impact on HIM enrollment of the uninsured. However, these findings did not diminish the usefulness of the 3Cs as a framework for understanding enrollment. The problem is that the 3Cs framework assumes that the consumer will make a rational choice, defined as a decision that will yield the greatest consumer utility (Downs, 1957). However, for a purchaser to make a rational choice about health insurance required a reasonable degree of health literacy. The present analyses examined the effect of the 3Cs on the uninsured, a population with some of the

lowest rates of health literacy (Kutzer, et al., 2006). HIMs that provided comparative

tools may have confused individuals; the ability to sort and filter plans may be useful, but

only if one understands what s/he is looking for. The additional layers of information

inherent to marketplace websites may have led individuals to feel insecure about their

purchase and decide not to buy health insurance (Besedeš, Deck, Sarangi, & Shor, 2015;

Botti & Iyengar, 2006; Iyengar & Kamenica, 2006). However, the greatest negative

impact on enrollment was registered with the use of one of the three tools; use of a

second or third commoditization tool further reduced enrollment but in diminished

amounts.

In terms of the interaction between commoditization and competition, the number

of insurance companies attenuated the effect of commoditization on enrollment. Instead

of an 8.5% decrease in enrollment for 1 commoditization tool, there was only a 0.66%

decrease in enrollment when an additional insurer was present. Competition had less of

an effect on enrollment in the presence of 2 and 3 commoditization tools. However, while

enrollment rates are better with the interaction effect, enrollment decreases by a greater

amount for each additional tool added to the multiplicative term. One possible

explanation is that larger numbers of insurance companies increase the number of plans

from which a consumer must choose. Although increased ability to compare health

insurance plans would seem to facilitate choosing plans from additional insurers, perhaps

the increased number of options overwhelmed the consumer, particularly because not all

insurers provided the same type of information via the HIM websites (Tripp, 2015). For

example, while some insurance companies may have provided information about

provider networks and formularies via the HIM website, others may have required visits

to external sites or requests to receive such information. This inability to compare certain aspects of plans via the HIM may have frustrated consumers.

5.7C Communication

Communication was not statistically significant in this study; however, as one of the 3Cs, it is necessary to discuss why this may have been so. The first is similar to the argument for commoditization; user friendliness of HIM websites and language accessibility are helpful only for individuals who know about the product they are trying to purchase. Sections 1001 and 1331 of the ACA required that "plain language" be used and health insurance glossaries be provided on the HIMs, but if the new enrollees chose plans based on low levels of health literacy, these features may not help them understand how an insurance plan would serve them practically. In fact, studies indicate that health literacy problems may actually be caused by low levels of health numeracy (Long et al., 2014; Peters, Meilleur, & Tompkins, 2014). "Numeracy is an individual's ability to use his or her judgment about whether to use math in a situation, what math to use, how to use it, and what degree of accuracy is appropriate" (Ginsburg, 2014, p.2). In particular, numeracy was a problem for over 50% of one study's respondents when they were asked to calculate out-of-pocket expenses (Norton et al., 2014).

The second reason that communication did not have a direct effect on enrollment is because communication may be a function of commoditization. An individual's understanding via clear communication would allow him/her to compare plans more easily. For example, quality ratings will be available to those enrolling in the fifth OEP. The ratings will be based on Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys assessing patient experience (CMS, 2017a). Consumer ratings inform

healthcare decisions (Reid, Deb, Howell, & Shrank, 2013). The ability to compare plans without a high degree of health literacy or numeracy may facilitate increased levels of enrollment.

5.8 Statistically Significant Controls for Study 2

As in study 1, Medicaid expansion and populations with lower educational attainment decreased enrollment; however, study 2 examines HIM enrollment of the uninsured by county. Medicaid expansion decreased the proportion of county HIM enrollment of the uninsured by 3.5%, and a 1% increase in those without high school diplomas within a county decreased the proportion of county enrollment by 127%.

These findings are supported by studies regarding enrollment and county rurality. According to the 2016 County Health Rankings, although the majority of the U.S. population lives in large urban metropolitan areas, 63% of counties are rural. Medicaid enrollment was lower in rural counties than in metropolitan counties from 2012-2015 (Barker, Huntzberry, McBride, & Mueller, 2017). Also, those who are less educated tend to live in more rural areas (Catlin et al., 2016).

5.9 Policy Recommendations for a Neoliberal Approach

The use of HIMs to provide health insurance is a neoliberal economic policy. Neoliberalism supports the belief that markets should be self-regulating "through free trade, strong property rights and minimal government interference, balanced by the 'rational' choice of a world of sovereign individual producers and consumers efficiently" (Labonté & Stuckler, 2016, p.2). Neoliberalism encourages privatization and deregulation; therefore it is generally supported by the Republican party (Akansel, 2016; Antonio & Brulle, 2011; Hartwich & Sally, 2009). However, neoliberalism requires the

state to provide an environment that can support the market (Ives, 2015). Market failures-
-concentrated market power, imperfect information, negative externalities, etc.—can
undermine market efficiency (Friedman, 2002). HIM failures within this market approach
stem from the inability to maximize utility and the reduced number of suppliers. Policy
recommendations will address market failures to improve HIM enrollment of the
uninsured.

5.9A Maximizing Utility and Imperfect Information

The free market assumes that rational actors will be able to conduct cost-benefit
analyses and make decisions in their best self-interests (Labonté & Stuckler, 2016). The
problem in the HIM is that the purchase of health coverage presents the consumer with
imperfect information in the face of an uncertain choice. Imperfect information refers to
lack of cognitive ability or lack of time/money when considering options (Simon, 1955).
Uncertainty pertains to a situation where the decision maker has limited knowledge about
the outcomes of a choice (Damghani, Taghavifard, & Moghaddam, 2009). When
confronted with imperfect information or risky decisions, as in the choice of health
coverage, individuals may "satisfice" or refuse to take action (Simon, 1957). In an effort
to improve HIM enrollment, one way would be to improve health literacy, thereby
improving information and consumer confidence.

The findings pertain to problems with health literacy by demonstrating that
greater populations of men, higher populations of those with less than a high school
education, and additional commoditization tools decreased the enrollment of the
uninsured via HIMs. In a study of a health literacy program, younger, male, and lower
educated consumers also reported lower levels of health literacy (Bartholomae, Russell,

Braun, & McCoy, 2016). If individuals do not have an understanding of how to choose insurance plans or how to use their coverage, low rates of health insurance literacy could lead to lower rates of HIM enrollment (Tripp, 2015). One way to combat low health insurance literacy is through community programs. According to the Office of Disease Prevention and Health Promotion, community programs are essential in outreach that improves health and quality of life (HHS, 2010).

Consumer assisters could be helpful with increased health insurance education initiatives. Although educating consumers about health insurance, one of the goals for navigators, the primary objective was enrollment. Evidence that consumer education was difficult to achieve is suggested by the fact that 90% of assisters reported that they received post-enrollment calls for additional assistance (Pollitz et al., 2014b). However, consumer assisters often lacked the training to help consumers with legal questions or the questions fell outside the assister's scope of responsibilities (Goodell, 2015). Perhaps providing services outside of open enrollment periods by navigators trained in specialty areas would allow for more in-depth and helpful conversations (Volk, Corlette, Ahn, & Brooks, 2014).

In addition to community programs, the commoditization tools used on HIM websites must also be examined. Qualitative think-aloud interviews, in which participants verbally express their thought process during an activity, could help researchers better understand how features may be confusing to users (Charters, 2003). These studies might also reveal problems with website communication to consumers. Results from the interviews could be used to update HIM tools according to consumer needs.

5.9B Premiums in Monopolistic Markets

Affordability of premiums may not seem to be a problem, because supporters of the ACA point out that increasing premiums are matched by increasing APTC–a subsidy which the vast majority of enrollees received (Jost, 2016). However, very low-income households or those who receive no subsidy assistance may struggle to afford increasing premiums (Levitt, Claxton, Damico, & Cox, 2016). Taxpayers too may wane in their support of the ACA if their financial responsibility continues to climb. The neoliberal approach to HIMs attempted to reduce premium prices for individual consumers by creating a market in which insurers would compete for enrollees. With little interference from the state, the forces of supply and demand can create an equilibrium of goods and services on which market values can be based. Insurers were encouraged to participate in HIMs through protections against high-cost enrollees--reinsurance and risk enrollment provisions. However, due to the federal government reneging on its promised reimbursement to insurance companies and the sunset of risk corridor and reinsurance in 2016, many insurers began to withdraw from the HIMs (Luhby, 2016). Furthermore, due to low penalties for not carrying health insurance, millions of Americans remain uninsured. HIMs are not attracting the large risk pools that insurers had hoped to secure. Larger risk pools are attractive due to the law of large numbers, in which insurers with greater numbers are less likely to fail (Friedman, 2002). Decreased insurers lead to a market failure of market power concentration, or monopolies.

Both studies 1 and 2 indicated that higher rates of average APTC, lower numbers of insurers, and decreased HIM enrollment due to Medicaid expansion were affordability factors that influenced enrollment of the uninsured. Several suggestions about how to

improve affordability of HIM plans by increasing the number of insurers *and* consumers

in the marketplace are worthy of mention here. To attract more insurers to HIMs and

reduce premiums, it may be advantageous to reintroduce the temporary risk mitigation

programs that expired in 2016: reinsurance and risk corridors (Cox et al., 2016).

Reinsurance insured companies against catastrophic illnesses of high-cost patients. Risk

corridors required the government to take money from plans with lower than expected

claims and make payments to plans with higher than expected claims. Without

reinsurance and risk-corridor programs during the first three years, insurers would have

had incentive to increase premiums in an effort to protect against potentially substantial

losses. The authors of the ACA thought that after 3 years of risk mitigation, insurers

could have accurately forecasted claims and therefore such risk mitigation programs

would no longer be necessary. However, the ACA premiums have remained unstable

(Morrisey, 2016). The risk corridor program may be difficult to revive. The initial law

stated that insurance companies would be reimbursed for their losses; however, after OEP

1, Congress required the program to be budget neutral and only compensated insurer

losses at around 13% (Jost, 2017). Several insurance companies are currently suing the

federal government for additional compensation. However, even without the risk corridor

program, allowing insurance companies to purchase subsidized reinsurance against

excessive losses from their HIM lines of business could encourage insurers to assume

more risk and expand their presence in HIMs.

It will also be necessary to increase the number of HIM consumers, because larger

risk pools are less likely to fail (Freidman, 2002). In order to increase the number of

consumers, the penalty for the failure to enroll needs to be increased. Also, because tax

penalties are only realized if the uninsured is due a tax refund, the Internal Revenue Service should be allowed to garnish wages if a penalty is due (Morrisey, 2016). There are calls to expand APTC to individuals who are not currently eligible in order to encourage additional purchases (AAA, 2017). Seventeen percent of the uninsured were deemed to have *affordable* employer-sponsored coverage; however, these individuals may remain uninsured because the plans may not be affordable when covering the entire family (ASPE, 2016; AAA, 2017). Under the ACA if an employee receives coverage as a fringe benefit provided by the employer and family coverage is an option but is not subsidized sufficiently, the insurance is deemed "affordable" if the entire family income is below the threshold of unaffordability for a single individual (the employee). This problem with determining affordability based on the employee alone is known as the "family glitch" (Brooks, 2014). Families subjected to this glitch are ineligible for subsidies. By allowing affordability of employer coverage to be based on the family income but also considering all the people making up that family, not just the employee, more people would be deemed eligible to apply via the HIMs and possibly qualify for subsidies. Another 11% of the uninsured have incomes greater than 400% FPL; their incomes are too high for them to qualify for financial aid. APTC could be expanded to those without access to other coverage who have incomes greater than 400% FPL in an effort to reduce this 11% of the uninsured whose incomes are too high to qualify for aid (AAA, 2017).

Even if plans are made more affordable to larger numbers of individuals, private insurance companies will offer higher deductible plans to discourage use and keep their own costs down. In fact, high deductible plans are being offered in order for insurers to

remain competitive in the HIM; the average deductible for Bronze plans, the level with the greatest patient cost-sharing, was $5300 in 2016 (Gaffney, Woolhandler, Angell, & Himmelstein, 2016). If people can purchase affordable health insurance, but are then unable to use it, they may be less likely to enroll.

The introduction of a public option--an insurance plan offered by the government—into the HIMs could inject competition and help control costs by dissuading insurance companies from padding premiums (Hacker, 2016). The Congressional Budget Office (2013) stated that the public option would offer health insurance plans with premiums of 7-8% lower than those of private plans. Lower premiums would mean that less money would be spent on APTC. The public option could also offer lower-priced premium plans without having high deductibles that keep people from accessing the care they need. Private health insurance companies would need to respond similarly to remain competitive.

Although there are concerns that the public option would require the government to establish health insurance, the government already negotiates the reimbursement of care via Medicaid and Medicare. The government could offer the public option via Medicare in which enrollees would select plans for which the government has already negotiated competitive rates (Blumberg & Holahan, 2016). This would eliminate the need to fashion a new model of health insurance by simply absorbing those who select the public option into Medicare. The public option would be contingent on the individual mandate. The individual mandate must be enforced and the penalty for not caring health insurance must be increased.

5.10 Concluding Thoughts

The problem is evident: neoliberal HIMs are not sustainable without addressing imperfect information to consumers, the market failure of monopolies and lack of purchasing power on the demand side, i.e., underfunded potential consumers. Millions remain uninsured, insurers are leaving the marketplace, and premium prices are rising. However, when the Republicans attempted to replace the ACA, only 8% of Americans supported the Senate doing so (Kirzinger, DiJulio, Hamel, Sugarman, & Brodie, 2017). The ACA also provided benefits to millions of constituents who do not wish to lose their new-found coverage. The politics favor bolstering the ACA in lieu of replacing it, with public support of the ACA at its highest since 2010 (Fingerhut, 2017). The Commonwealth Fund indicated that 75% of Americans believe that the health system should be restructured and only 26% support full repeal of the ACA (Schoen et al., 2013; Gonzales, 2016).

The principal alternative to a neoliberal regime is the welfare state, whose signature institutions for providing for the general welfare are social insurance programs. Social insurance programs are financed by taxes levied on a broad tax base and everyone shares in the coverage provided. A prominent characteristic of social insurance is that it does not require determining the income of recipients, in contrast to most social programs in the U.S., which are means-test. The U.S. has two long-established social insurance programs, Social Security and Medicare. There has been a long standing movement in the U.S. to provide social insurance covering health care. Perhaps its high point came when Harry Truman's effort to achieve universal, comprehensive, national health insurance failed in 1949-1950 (Starr, 2008). The contemporary advocates for social insurance of

health care sail under the banner of the "single-payer plan" and "Medicare-for-all." These advocates felt very aggrieved that they received almost no hearing from the Obama administration and Congress in the deliberations that led to the ACA. The administration had decided early on that only a neoliberal approach which built upon earlier ideas of Republican think-tanks and the working example in Massachusetts had any chance of Congressional enactment (Starr, 2011).

With the impending demise of the ACA, several "laboratories of democracy" are trying to implement single-payer plans as a replacement for the ACA. California and New York legislatures have attempted to pass bills for state-sponsored social insurance to all residents (Hervey, Mullin, & Bordelon, 2017). States that implemented such a model would eliminate the need for private insurance companies and ensure coverage for all. Universal coverage is offered in countries like Canada and the Netherlands, but those countries abandoned market solutions for basic necessities like health care, pensions, and decent child care decades ago. In the complex postmodern world that we inhabit markets cannot function without significant and on-going government interventions that reach far beyond the mere enforcement of contracts that was the hallmark of nineteenth century liberalism (Reis, 2012). Modern Republicans generally do not support social insurance, preferring instead market-based solutions for the provision of basic necessities like food and education, which they would subsidize with means-tested vouchers (Dalen et al., 2015). If the state is not allowed to intervene when the market fails, the ACA or any other insurance program, will founder.

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APPENDIX A: CLEARCHOICES HIM SCORECARD

INSURANCE EXCHANGE WEBSITE	WINDOW-SHOPPING TOOL		DEFAULT ORDER	SMART, COMPARATIVE PLAN DISPLAY PAGE			OUT-OF-POCKET COST CALCULATOR	INTEGRATED PROVIDER DIRECTORY	INTEGRATED DRUG DIRECTORY	USER-FRIENDLY NAVIGATION		INDEXED SCORE**
	ANONYMOUS BROWSING	CUSTOMIZED PLAN INFO		SIDE-BY-SIDE COMPARISONS	SMART PLAN FINDER	HIGHLIGHTS CSR PLANS				LAYOUT	LANGUAGE ACCESSIBILITY	
KYNECT	YES	A	YEARLY COST ESTIMATE	YES	NO	YES	A	A	B	B	A	84
WASHINGTON HEALTHPLANFINDER	YES	A	PREMIUMS	YES	YES	YES	F	A	F	A	B	74
ACCESS HEALTH CT	YES	A	SMART SORT	YES	YES	YES	B	F	F	B	B	71
COVERED CALIFORNIA	YES	A	SMART SORT	YES	YES	YES	F	F	F	B	A	64
HEALTHCARE.GOV	YES	A	PREMIUMS	YES	NO	NO	C	B	C	A	B	63
DC HEALTH LINK	YES	A	YEARLY COST ESTIMATE	YES	NO	NO	B	A	F	A	F	63
MARYLAND HEALTH CONNECTION	YES	A	SMART SORT	YES	YES	YES	F	F	F	B	F	63
HEALTHSOURCE RI	YES	A	PREMIUMS	YES	YES	YES	C	F	F	C	B	63
MNSURE	YES	A	YEARLY COST ESTIMATE	YES	NO	YES	B	F	F	A	F	61
YOUR HEALTH IDAHO	YES	A	PREMIUMS	YES	NO	YES	D	F	F	B	B	59
CONNECT FOR HEALTH COLORADO	YES	F	PREMIUMS	YES	NO	NO	F	A	A	A	B	55
MASSACHUSETTS HEALTH CONNECTOR	YES	F	PREMIUMS	YES	NO	NO	F	C	F	C	A	35
NEW YORK STATE OF HEALTH	YES	B	PREMIUMS	YES	NO	NO	F	F	F	C	A	30
VERMONT HEALTH CONNECTION	NO	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	F	N/A*

*N/A: Indicates that the exchange website features were not accessible for evaluation because the website did not offer a window-shopping tool. **Indexed Weighted Composite Score
*Your Health Idaho's Out-of-Pocket Cost Calculator only provides a "Low," "Medium," or "High" cost estimate for each plan, which offers lower utility than a specific dollar amount for consumers.

Source: From "2016 Health Insurance Exchanges: the good, the bad, and the ugly," by A. Rao, J. White, and K. Allen, 2015.
(https://static1.squarespace.com/static/547e0e88e4b04a9dc29e99/t/566adad82399a3174ab6b199/1449843416077/CC+2016+HealthInsExchanges+webv.pdf)
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APPENDIX B: STUDY 1-MODEL WITH EDUCATIONAL VARIABLE

	Coefficient	Std. Errors*	p-value	95% Confidence Intervals	
Marketplace Type	-0.279	0.164	0.088	-0.600	0.041
Age	5.417	2.770	0.051	-0.012	10.846
Race	0.996	0.508	0.050	0.001	1.990
Sex	-23.450	7.385	0.001	-37.924	-8.976
Educational Attainment	-4.720	1.902	0.013	-8.447	-0.992
Limited English Proficiency	2.054	1.390	0.139	-0.670	4.778
Average APTC	0.001	0.001	0.031	0.000	0.002
Medicaid Expansion	-0.399	0.086	0.000	-0.568	-0.231
1 measure of dissent	0.031	0.089	0.730	-0.144	0.206
2 measures of dissent	0.090	0.126	0.478	-0.158	0.337
Mixed party control	-0.306	0.203	0.131	-0.703	0.091
Republican party control	-0.362	0.214	0.091	-0.782	0.058
2nd OEP	-0.396	0.107	0.000	-0.605	-0.187
3rd OEP	-0.319	0.109	0.003	-0.532	-0.106
Intercept	9.393	3.860	0.015	1.828	16.958
Observations	153				
Wald chi-square	218.25				
Prob > chi-square	0.00				

*Standard Errors are robust.

APPENDIX C: STUDY 1-MODEL WITH POVERTY VARIABLE

	Coefficient	Std. Errors*	p-value	95% Confidence Intervals	
Marketplace Type	-0.265	0.157	0.091	-0.573	0.042
Age	6.404	3.048	0.036	0.431	12.378
Race	1.016	0.547	0.063	-0.056	2.089
Sex	-17.254	6.842	0.012	-30.664	-3.844
Below Poverty	-2.793	1.680	0.097	-6.087	0.502
Limited English Proficiency	0.554	1.564	0.723	-2.512	3.620
Average APTC	0.001	0.001	0.154	0.000	0.002
Medicaid Expansion	-0.407	0.097	0.000	-0.597	-0.218
1 measure of dissent	0.039	0.091	0.668	-0.139	0.217
2 measures of dissent	0.120	0.149	0.421	-0.172	0.412
Mixed party control	-0.337	0.189	0.075	-0.708	0.034
Republican party control	-0.404	0.202	0.046	-0.800	-0.007
2nd OEP	-0.383	0.110	0.000	-0.598	-0.169
3rd OEP	-0.283	0.114	0.013	-0.508	-0.059
Intercept	6.223	3.588	0.083	-0.809	13.254

Observations	153
Wald chi-square	128.47
Prob > chi-square	0.00

*Standard Errors are robust.

APPENDIX D: STUDY 1-IDEOLOGY MEASURED BY MEDICAID EXPANSION

	Coefficient	Std. Errors*	p-value	95% Confidence Intervals	
Marketplace Type	-0.140	0.144	0.329	-0.421	0.141
Age	5.545	3.296	0.092	-0.915	12.006
Race	0.901	0.486	0.064	-0.051	1.853
Sex	-27.582	7.164	0.000	-41.623	-13.540
Educational Attainment	-7.098	2.368	0.003	-11.739	-2.457
Below Poverty	1.509	2.237	0.500	-2.875	5.892
Limited English Proficiency	3.126	1.579	0.048	0.030	6.221
Average APTC	0.001	0.001	0.010	0.000	0.003
Medicaid Expansion	-0.308	0.085	0.000	-0.475	-0.140
2nd OEP	-0.395	0.106	0.000	-0.603	-0.186
3rd OEP	-0.372	0.128	0.004	-0.622	-0.122
Intercept	11.091	3.824	0.004	3.595	18.588
Observations	153				
Wald chi-square	173.72				
Prob > chi-square	0.00				

*Standard Errors are robust.

APPENDIX E: STUDY 1-IDEOLOGY MEASURED BY DISSENT

	Coefficient	Std. Errors*	p-value	95% Confidence Intervals	
Marketplace Type	-0.239	0.155	0.123	-0.542	0.064
Age	3.835	3.634	0.291	-3.289	10.958
Race	0.950	0.520	0.067	-0.068	1.969
Sex	-28.462	7.694	0.000	-43.543	-13.381
Educational Attainment	-6.996	2.595	0.007	-12.081	-1.910
Below Poverty	2.093	2.508	0.404	-2.823	7.010
Limited English Proficiency	2.501	1.998	0.211	-1.416	6.419
Average APTC	0.002	0.001	0.003	0.001	0.003
1 measure of dissent	0.076	0.117	0.514	-0.153	0.305
2 measures of dissent	0.000	0.154	0.999	-0.302	0.303
2nd OEP	-0.379	0.108	0.000	-0.591	-0.167
3rd OEP	-0.371	0.128	0.004	-0.622	-0.120
Intercept	11.387	3.984	0.004	3.578	19.196
Observations	153				
Wald chi-square	57.98				
Prob > chi-square	0.00				

*Standard Errors are robust.

APPENDIX F: STUDY 1-IDEOLOGY MEASURED BY PARTY CONTROL

	Coefficient	Std. Errors*	p-value	95% Confidence Intervals	
Marketplace Type	-0.332	0.160	0.038	-0.646	-0.018
Age	3.492	3.614	0.334	-3.590	10.575
Race	1.087	0.564	0.054	-0.018	2.191
Sex	-28.108	7.831	0.000	-43.455	-12.760
Educational Attainment	-6.591	2.664	0.013	-11.813	-1.369
Below Poverty	1.936	2.655	0.466	-3.268	7.140
Limited English Proficiency	2.521	1.729	0.145	-0.868	5.911
Average APTC	0.002	0.001	0.004	0.001	0.003
Mixed party control	-0.213	0.200	0.288	-0.604	0.179
Republican party control	-0.112	0.204	0.584	-0.513	0.289
2nd OEP	-0.381	0.108	0.000	-0.593	-0.169
3rd OEP	-0.339	0.111	0.002	-0.557	-0.121
Intercept	11.270	3.993	0.005	3.443	19.096
Observations	153				
Wald chi-square	56.94				
Prob > chi-square	0.00				

*Standard Errors are robust.

APPENDIX G: STUDY 1-LINEAR REGRESSION

	Coefficient	Std. Errors	p-value	95% Confidence Intervals	
Marketplace Type	-0.036	0.023	0.128	-0.083	0.011
Age	0.926	0.413	0.029	0.096	1.755
Race	0.131	0.064	0.045	0.003	0.259
Sex	-3.206	0.980	0.002	-5.174	-1.238
Educational Attainment	-0.927	0.380	0.018	-1.691	-0.163
Below Poverty	0.261	0.394	0.512	-0.531	1.053
Limited English Proficiency	0.391	0.239	0.108	-0.088	0.871
Average APTC	0.000	0.000	0.020	0.000	0.000
Mixed party control	-0.037	0.030	0.224	-0.097	0.023
Republican party control	-0.052	0.034	0.126	-0.120	0.015
Observations	153				
F(15,50)	9.600				
Prob>F	0.000				

APPENDIX H: STUDY 1-BETA REGRESSION

	Coefficient	Std. Errors*	p-value	95% Confidence Intervals	
Marketplace Type	-0.263	0.149	0.076	-0.554	0.028
Age	4.518	2.917	0.121	-1.199	10.236
Race	0.794	0.535	0.138	-0.255	1.842
Sex	-24.259	7.723	0.002	-39.397	-9.123
Educational Attainment	-6.050	2.889	0.036	-11.712	-0.389
Limited English Proficiency	2.460	1.456	0.091	-0.393	5.313
Average APTC	0.001	0.001	0.008	0.000	0.002
Medicaid Expansion	-0.383	0.084	0.000	-0.548	-0.219
1 measure of dissent	0.024	0.088	0.784	-0.149	0.197
2 measures of dissent	0.094	0.122	0.440	-0.145	0.334
Mixed party control	0.203	0.194	0.297	-0.583	0.178
Republican party control	-0.244	0.213	0.252	-0.662	0.174
Observations	153				
Wald chi-square	226.46				
Prob > chi-square	0.00				

*Standard Errors are robust.

APPENDIX I: MEAN AND ERROR IN A MULTILEVEL MODEL
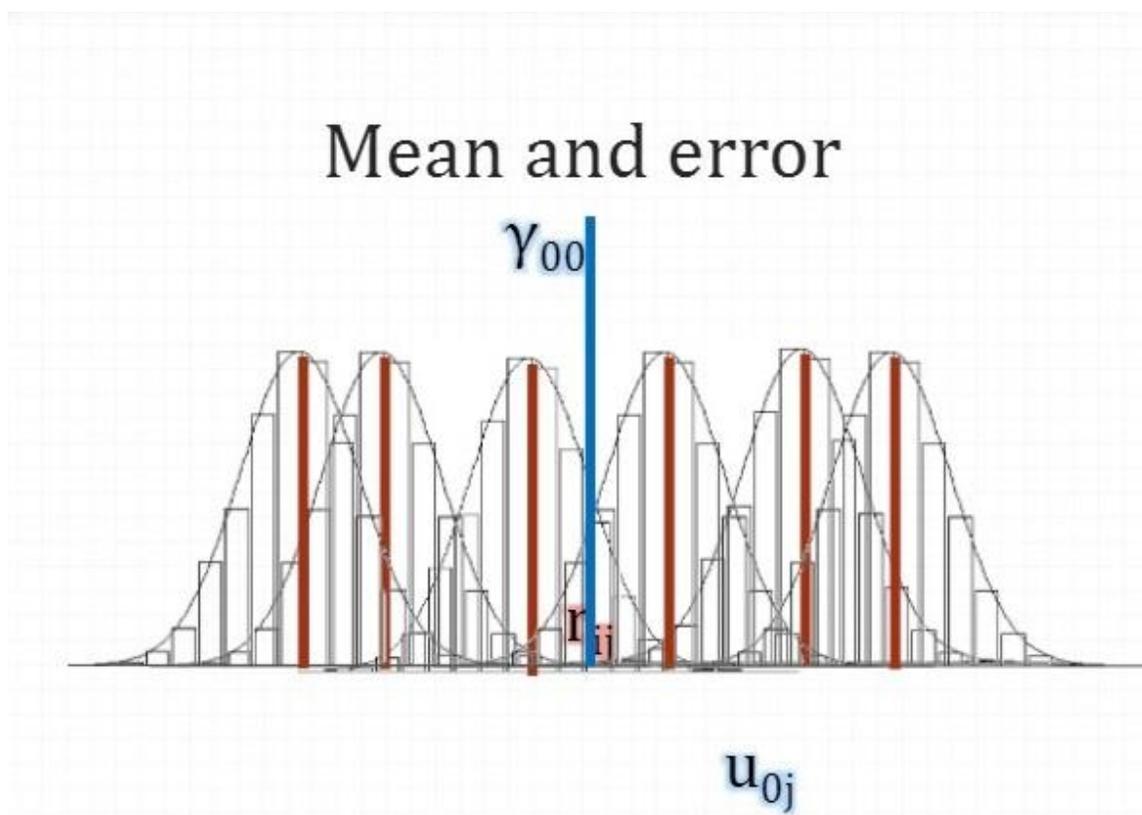
Source: Manning, M. (2016). *Modeling a Mean* [PowerPoint slides]. Retrieved from Multilevel modeling course at the University of Michigan – Ann Arbor Inter-university Consortium for Political and Social Research, Summer 2016. Copyright 2016 by Mark Manning. Used with permission.

APPENDIX J: STUDY 2 MODEL WITH HIRSCHMAN-HERFINDAHL INDEX

	Coefficient	Std. Error*	p-value	95% Conf. Interval	
Moderately Concentrated market	-0.015	0.043	0.732	-0.098	0.069
Highly concentrated market	0.051	0.010	0.000	0.031	0.071
Average APTC	0.000	0.000	0.150	0.000	0.000
Sex	-0.947	1.020	0.353	-2.946	1.051
Educational attainment	-1.282	0.243	0.000	-1.758	-0.805
1 Commoditization tool	-0.073	0.081	0.365	-0.232	0.085
2 Commoditization tools	-0.038	0.030	0.211	-0.098	0.022
3 Commoditization tools	-0.011	0.042	0.801	-0.093	0.072
Communication	-0.001	0.073	0.990	-0.144	0.142
Medicaid Expansion	-0.032	0.013	0.014	-0.057	-0.006
Intercept	0.981	0.523	0.061	-0.045	2.007
Log likelihood	3876.9517				
Groups	43				

*Standard Errors are robust.

APPENDIX K: STUDY 2 MODEL WITH CENTERED VARIABLES

	Coefficient	Std. Error*	p-value	95% Conf. Interval	
County Plans	-0.015	0.043	0.732	-0.098	0.069
County Insurers	0.011	0.002	0.000	0.007	0.015
Average state plans	0.000	0.001	0.761	-0.001	0.001
Average state insurers	0.005	0.007	0.533	-0.010	0.019
Average APTC	0.000	0.000	0.171	0.000	0.000
Sex	-0.777	1.070	0.468	-2.875	1.321
Educational attainment	-1.265	0.247	0.000	-1.749	-0.782
1 Commoditization tool	-0.083	0.082	0.309	-0.243	0.077
2 Commoditization tools	-0.039	0.030	0.203	-0.098	0.021
3 Commoditization tools	-0.017	0.042	0.688	-0.100	0.066
Communication	-0.011	0.075	0.879	-0.158	0.135
Medicaid Expansion	-0.036	0.015	0.014	-0.064	-0.007
Intercept	0.732	0.522	0.160	-0.290	1.755

Log likelihood	3901.7101
Groups	43

*Standard errors are robust.

APPENDIX L: STUDY 2 MODEL WITH HHI AND CENTERED

	Coefficient	Std. Error*	p-value	95% Conf. Interval	
County Plans	0.000	0.000	0.322	-0.001	0.000
County Insurers	0.010	0.002	0.000	0.006	0.014
Average state plans	0.000	0.001	0.753	-0.001	0.001
Average state insurers	0.004	0.007	0.549	-0.010	0.019
Moderately concentrated market	-0.007	0.042	0.864	-0.090	0.076
Highly concentrated market	0.016	0.011	0.173	-0.007	0.038
Average APTC	0.000	0.000	0.171	0.000	0.000
Sex	-0.779	1.073	0.468	-2.882	1.325
Educational attainment	-1.266	0.248	0.000	-1.751	-0.781
1 Commoditization tool	-0.083	0.082	0.312	-0.243	0.078
2 Commoditization tools	-0.038	0.030	0.212	-0.098	0.022
3 Commoditization tools	-0.017	0.042	0.696	-0.100	0.067
Communication	-0.011	0.075	0.881	-0.158	0.136
Medicaid Expansion	-0.036	0.015	0.015	-0.064	-0.007
Intercept	0.734	0.523	0.161	-0.292	1.759

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Log likelihood 3901.7101	3903
Groups	43

*Standard errors are robust.

APPENDIX M: HEALTHCARE.GOV FILTERS (1/4)

APPENDIX M: HEALTHCARE.GOV FILTERS (CONTINUED 2/4)

APPENDIX M: HEALTHCARE.GOV FILTERS (CONTINUED 3/4)

APPENDIX M: HEALTHCARE.GOV FILTERS (CONTINUED 4/4)