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Effects the 2014 Medicaid Expansion on Seat belt use: An Investigation into Moral Hazard

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**Effects the 2014 Medicaid Expansion on Seat Belt Use:
An Investigation into Moral Hazard**

An honors thesis presented to the
Department of Economics
University at Albany, State University of New York
In partial fulfillment of the requirements
for graduation with Honors in Economics
and
graduation from the honors college

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Research Advisor: Dr. Pinka Chatterji

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ABSTRACT

Under the Patient Protection and Affordable Care Act, signed into law by President Obama in 2010, health insurance coverage was expanded to 20 million previously uninsured people. Of these, 14.5 million were Medicaid eligible. Moral Hazard, a common research topic in insurance, is defined as when the private actions of an individual in a risk-sharing situation influence the probability of the outcome. There are two types of moral hazard, called ex-post moral hazard and ex-ante moral hazard. In the case of health insurance, ex-post moral hazard is when a health behavior changes after an individual becomes insured. Ex-ante moral hazard, which is what is being investigated in this paper, is when a behavior changes and potentially causes a health event. This paper considers that ex-ante moral hazard developed in the portion of the population insured by Medicaid following its expansion in 24 states. A difference-in-difference model is used to compare these 24 states to the 18 that have not voted to expand Medicaid. There are eight states which are excluded from the model because the legislatures of these states voted to expand Medicaid after the January 1, 2014 deadline. The data came from the Behavioral Risk Factor Surveillance System, which is maintained by the Centers for Disease Control. I examine the rate of seat belt use as a risky health behavior in expansion states versus non-expansion states to determine if there is a difference resulting from moral hazard. Results show that there is no decrease in seatbelt use associated with the expansion of Medicaid.

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INTRODUCTION & BACKGROUND

Health insurance has become an increasingly prevalent issue in American society today. A major goal of President Obama's first administration was to establish effectively "universal health insurance"—a country where 100% of individuals were covered by some form of health insurance, whether that be public or private (Jung & Tran, 2016). With the passage of the Patient Protection and Affordable Care Act (ACA) in 2010, health insurance coverage expanded to over 20 million additional people who were not previously covered (Jung & Tran, 2016). The expansion was enabled by allowing individuals to remain covered by their parent's insurance plan until age 26, the development of marketplaces, prohibiting insurance companies from denying coverage on the basis of a pre-existing condition, not allowing insurance companies to revoke coverage at the time a service is required, and expanding Medicaid by enacting less stringent qualification requirements. Of the 20 million individuals who became covered because of the provisions of the ACA, 14.5 million were Medicaid eligible (Jung & Tran, 2016; Courtemanche, Marton, Ukert, Yelowitz, & Zapata, 2017). Research suggests that expansions of health insurance induced by the ACA have increased insurance coverage rates, improved utilization and improved health. However, the ACA may inadvertently have negatively impacted health through moral hazard.

The purpose of this paper is to investigate the relationship between health insurance and risky health behaviors. Historically, research into the notion of a change in risky behavior due to insurance coverage has been inconclusive. However, the group of individuals which became covered because of the Medicaid expansion have not been studied to see if the effects of moral hazard are apparent. As documented in Dong

(2013), the traditional causalities studied are the ex-post moral hazard effect of health insurance on the use of health care, and the selection effect of the use of health care on health insurance. Dong argues that the complete picture must incorporate health-related behaviors, and not just health insurance and propensity to use health care. Dong's argument is that health insurance has a true moral hazard effect on health-related behaviors, and that health-related behaviors have a selection effect on health insurance. This selection effect is adverse selection—meaning that individuals choose their health insurance based on their own health behavior, and is also documented by Einav, Finkelstein, Ryan, Schrimpf and Cullen (2013). These health behaviors are usually not known to the insurer, thus creating an asymmetrical distribution of information.

The true moral hazard effect described by Dong is defined by Holmstrom (1979) as “when individuals engage in risk sharing under conditions such that their privately taken actions affect the probability distribution of the outcome”, meaning that one party decides to take an action for which another party bears the cost of a negative outcome resulting from that action. In the case of health insurance, this can be interpreted as if one's health insurance will pay or help pay for one's care, one may take more risks or be less cautious about their behaviors because he or she knows that any negative health outcome will be covered (Dave & Kaestner, 2008). This is called ex-ante moral hazard—meaning a behavior changed after an individual became covered by health insurance and will be the focus of the investigation described in this paper. An example of ex-ante moral hazard specifically is an individual, who was previously cautious regarding their health because they were exposed to the negative financial

consequences and the loss of utility, becoming more reckless about their health after they become insured. In the case of the Medicaid expansion brought on by the ACA, which is the subject of this paper, we are interested in determining if this effect is apparent within the group of individuals who received Medicaid coverage as of 1 January 2014.

Medicaid, which is a publicly-funded form of health insurance and was created under President Lyndon B. Johnson's administration, provides insurance to individuals who fall below a certain income level and are not otherwise covered with health insurance by their employer or any other source, such as family members or significant others. Historically, Medicaid was intended to be used primarily by low-income single mothers. While anyone falling below the threshold for Medicaid is qualified, the expansion affected mostly single, childless males. Upon passage of the ACA, called colloquially "Obamacare", three of the most significant reforms to the American health care system since the introduction of Medicaid in 1965 took effect. The three reforms are first, regulations were put in place which prohibited health insurance providers to deny coverage to an individual based on a pre-existing condition. They are required to determine premiums based primarily on age. Second, an individual mandate to purchase insurance was established. This mandate requires all individuals to be covered by health insurance, whether it is through the state "exchanges" set up due to the law, through an employer or through Medicaid. Finally, the law raised the level at which individuals will no longer qualify for Medicaid (Simon, Soni & Cawley, 2017; Courtemanche et al., 2017). The Medicaid expansion, while not an expansion of the kind of coverage that is being provided, is an expansion in that more individuals will become

eligible for the program. The Medicaid threshold became 133 percent of the federal poverty level and it removed the asset test, which was an asset ceiling that an individual's asset holdings could not exceed if they were to be Medicaid eligible (Jung & Tran, 2016; Simon et al., 2017; Courtemanche et al., 2017).

While health insurance does not decrease the total cost of any health service, it does decrease the cost to the individual, which may allow them to access services more frequently than if they had to pay the full cost of those services on the margin. As a result, health insurance may make individuals healthier because accessing health services more frequently can make an individual healthier (Kelly & Markowitz, 2009). However, unnecessary or excessive visits to healthcare providers will run up costs for insurance providers and health care providers at a much higher rate than the individual accessing the services. This may make health insurance more expensive in the long run, resulting in some poorer people being priced out of the health care if they are uninsured and forcing them to obtain insurance through Medicaid (Courtemanche et al., 2017). Rising costs of health insurance and decreasing numbers of individuals covered by employers created a gap in insurance coverage among people who were too wealthy to be previously covered by Medicaid, but were uncovered by private insurance. With the expansion of Medicaid in 2014, more individuals became eligible for this public health insurance, necessitating study of the unintended effects of this new coverage.

In theory, the significance of moral hazard seems to be very large, but in practice, it has been found to be relatively insignificant and difficult to prove (Dave & Kaestner, 2009; Kelly & Markowitz, 2017). This is due in part to the fact that many forms of health insurance offer incomplete coverage. Even if a consumer is protected from the

monetary loss of a negative health event, such as the cost of medical expenditures and lost earnings, he or she will not be protected from the utility loss (Kenkel, 2000). This uncovered loss of utility, Kenkel argues, is enough to prevent ex-ante moral hazard from developing in the insured population. However, the population to which Medicaid was expanded under the Affordable Care Act is a population which was largely uninsured prior to that expansion (Dong, 2012). There is reason to believe that this group, comprised of low-income individuals, will have a change in behaviors because of the expansion because this group was unlikely to be covered by private insurance before the expansion. Specifically, if they were accessing health services before, they can do so at a much lower personal cost and if they were not accessing health services, they now can do so at little to no personal cost. This change in circumstance and increase in disposable income for some may encourage a change in behavior and the existence of ex-ante moral hazard, which has not been seen before.

In developed countries, morbidity and mortality are more often the result of chronic health behaviors rather than infectious diseases (Cawley & Ruhm, 2011). Meginning and Foege (2011) estimated that in 1990, one half of the deaths in the United States were a result of “external modifiable risk factors”, or behaviors. These behaviors include, for example, smoking, obesity, alcohol use, and seat belt usage. The outcome of interest will be the comparison of states which did expand Medicaid to those which did not, while controlling for these variations in population subgroups, like race, ethnicity and sex. This examination will provide insight into the influence of expanded health insurance on the behaviors of low-income individuals, specifically into if it has caused an increase in risky behaviors. Cawley and Ruhm establish that there are a

variety of factors which can influence health outcomes, including occupation, education and income, among others. These individual characteristics will be controls in this analysis. For this investigation, the health behavior of interest will be seat belt usage. Not utilizing a seatbelt when riding in a car is considered a risky health behavior (Cawley & Ruhm, 2017), and is considered an external modifiable risk factor by Meginning and Foege because it is a lifestyle choice. Seatbelt usage is an appropriate variable with which to measure ex-ante moral hazard because it captures the rate of reckless driving behavior, which is associated with negative health outcomes. Motor vehicle accidents are a leading cause of death for adults in America. Many injuries, including the most severe which require the highest level of medical treatment, are the result of not wearing a seat belt. Wearing a seat belt does not guarantee an injury requiring medical attention, much like wearing a seat belt does not guarantee an injury free accident. However, not using a seat belt it is associated with negative health outcomes (McDonald, Sommers, & Fargo 2014).

MODEL & DATA

The Behavioral Risk Factor Surveillance System (BRFSS) is a telephone-based survey conducted by the Centers for Disease Control (CDC) and compiled into a public-use dataset available online through the CDC website. It is a pooled cross-sectional survey, with data available for all 50 states, the District of Columbia, and territories of the United States beginning in 1984. At the time of this paper, the latest year available is 2016. This study examines the years 2010 through 2016 and usually has between 380,000 and 430,000 unique responses per year. For this time frame, there was a total of 2,770,687 individual observations. Additionally, this survey captures a diverse

representation of the population of the United States. There are respondents from varying income and education levels, ages, genders, and other socioeconomic factors. Regardless of an individual's demographic characteristics, the survey asks respondents to answer a variety of questions about their health, including health behaviors, such as alcohol consumption, smoking, and seatbelt usage. Alcohol consumption and smoking are health behaviors which have been studied in great depth, while seatbelt usage has not been examined so carefully, and not in the context of ex-ante moral hazard.

One would expect that if ex-ante moral hazard had developed in the Medicaid-eligible portion of the population following the expansion of the program, the rate at which individuals wear seatbelts would be lower in the expansion states when compared to the non-expansion states. Many locales engage in extensive public health campaigns meant to increase the use of seatbelts. Police departments also engage in strict enforcement of existing laws with steep penalties, which are used to motivate individuals to wear a seatbelt (Hedlund, Gilbert, Ledingham, & Preusser 2008). If ex-ante moral hazard developed, it would be despite these initiatives.

The BRFSS includes a question about an individual's seat belt use. The question from which the variable of interest is derived asks respondents to state how often they wear a seatbelt when they ride in a car, from "never" to "always", and includes an option for those who never ride in automobiles. The calculated variable used in this investigation grouped respondents into two categories—those who always or nearly always wear seatbelts, and those who seldom or never wear seatbelts, or never ride in cars.

A difference-in-differences model is used to predict the rate of seatbelt usage for an individual. The advantage of utilizing this kind of model is that it allows for the use of a pseudo-natural experiment from observational data. Controls for education, marital status, and employment status in the home were included. For the controls, did not finish high school, married, and employed were the comparison groups for education level, marital status, and employment status, respectively.

State-fixed effects and year-fixed effects were also included. The purpose of including the state and year fixed effects is to capture any difference in seat belt usage rates resulting from exogeneous factors affecting only respondents from a single state, or responses coming from a single year. The other control variables are socioeconomic factors which have an established effect on health behavior (Zimmerman, Woolf & Haley 2015). The model is shown below:

$$\text{Seatbelt} = \beta(\text{expand}) + \beta(\text{post}) + \beta(\text{expandpost}) + \beta(\text{race}) + \beta(\text{marital status}) + \beta(\text{employment status}) + \beta(\text{education}) + \beta(\text{year-fixed effects}) + \beta(\text{state-fixed effects}) + \mu + \varepsilon$$

To capture the Medicaid-eligible portion of the population in the model, the sample was limited to individuals with a reported income of less than \$25,000 and under the age of 65. While individuals older than age 65 may be Medicaid-eligible depending on the state in which they live and other individual characteristics, it is assumed for this paper that most of their insurance would come from Medicare, not Medicaid. 36% of all Medicaid spending is on dual-eligible enrollees, but 65% of this spending is long-term, which is not usually covered by Medicare (Young, Garfield, Musumeci, Clemans-Cope, & Lawton, 2013). Because these services are medically necessary, over-utilization due to ex-ante moral hazard would likely not develop here. Additionally, because these

services make up the majority of spending on dual eligible individuals, and there is no way to distinguish between spending on long term care and acute care, all individuals older than age 65 who qualify for Medicaid are excluded, as not to influence the results.

Excluding the District of Columbia, of the 50 states, 24 had adopted the expansion by January 1, 2014. Refer to Appendix A for a map indicating which states had or not adopted the Medicaid expansion. These states will form the treatment group. Regardless of the actual date a state chose to adopt the Medicaid expansion, if the successful vote to adopt occurred before 1 January 2014, the expanded coverage became effective on that date. There are 8 states which adopted the expansion after that date (Michigan, New Hampshire, Pennsylvania, Alaska, Montana, Louisiana and Maine) which will be excluded from this analysis due to lack of sufficient post-expansion data. There are 18 states which did not expand Medicaid prior to January 1, 2014 and have not expanded since that date. These states will form the control or comparison group. Using these groups, the states will be compared to themselves year-to-year before and after the expansions, and the groups will be compared to each other before and after 2014. The years 2010-2013 will be used to establish the baseline for all the states. 2014 through 2016 will be the years for the “treatment” group of 24 states which did expand Medicaid.

The literature indicates that men and women have differing attitudes towards risky health behaviors (Dawson, Schneider, Fletcher, & Bryden, 2007; Harris, Jenkins, & Glaser 2006; McDonald, Sommers, & Fargo, 2014). Having children in the home can also impact the health behaviors of the parents. For that reason, separate regressions

will be run for men and women with and without children, so that the effects of gender and children can be better examined.

RESULTS

For seat belt use, it is not unreasonable to assume that, without the expansion in Medicaid, that the trend of increasing use over time would continue in both expansion and non-expansion states. As established, continuing enforcement of existing laws, public health campaigns, and changing public sentiment would likely continue to influence the rate of seat belt use, regardless of the Medicaid expansion. Ex-ante moral hazard would be shown by a negative and statistically significant coefficient on the “Expandpost” variable.

“Expand” is a binary variable which is equal to 1 if and only if the respondent lives in one of the 24 states which voted to expand. “Post” is a binary variable which is equal to one if and only if the response comes from after 2014. “Expandpost”, which is “Expand” * “Post”, measures the difference in seat belt use resulting from being a part of the treatment group.

The table shown below is for the variables of most significant interest. Refer to appendix B for the complete output.

Table 1	Expand	Post	Expandpost	
Male				
Without Children	-.113***	.03***	-.007	
	(.0039)	(.0106)	(.008)	N=108,003 R ² =.0297
With Children	-.170***	.0002	-.004	
	(.0067)	(.012)	(.009)	N=39,692 R ² =.0438

Note: In addition to variables listed, the model included state fixed effects, year fixed effects, education, race, marital status, and employment status. * indicates significance at the .10 level, ** indicates significance at the .05 level, and *** indicates significance at the .01 level. All standard errors, listed in parentheses, are robust standard errors.

Table 1 shows the results for Males. Column 1, corresponding to the “Expand” variable, shows a 17-percentage point decrease in seat belt use for males with children resulting from living in an Expansion state. While not investigated in this study, these states may have common practices regarding the enforcement of existing seatbelt laws. It has been indicated that the most effective way to raise seat belt use is to have high-visibility seat belt law enforcement, as opposed to any awareness campaign spending or demographic characteristics of a state (Hedlund et al., 2008). The cause of the observed decrease here may be related to this, but should be studied further to better

understand the true cause. A similar but smaller in magnitude decrease of 11 percentage points is also observed in Males without children.

Column 2 measures the change in seat belt usage resulting from a response from after 2014 compared to a response from before 2014. For both males without and with children, there is an observed increase of 3% and .005%. While only the increase of 3% for males without children is statistically significant, the positive values of this variable indicate that seat belt use is rising over time, perhaps due to the same increase in enforcement over time. There is an opportunity for future study here to endeavor to explain this increase over time, along with the difference in seat belt use in expansion versus non-expansion states.

For this study, the variable of most important interest is Expandpost. There are .06% and .034% decreases in seat belt use for males with and without children, respectively, associated with this variable. Although neither case is statistically significant, the negative sign of the value would indicate a moral hazard effect. However, given the small magnitude of the changes and their statistical insignificance, the conclusion must be that there is not sufficient evidence to indicate higher risky behavior resulting from ex-ante moral hazard, as measured by seat belt use. As established, there may be exogeneous factors not included here which have an influence on seat belt use. Awareness campaigns, while not the most effective way to increase usage, are common in many locales and not thought to be ineffective. Generally measured by spending, these campaigns were not included in the model. Inclusion of these in the future iterations of this design provides an opportunity to better explain the results shown here.

Table 2	Expand	Post	Expandpost	
Female				
Without Children	-.067***	-.001	-.002	
	(.003)	(.005)	(.004)	N=138,248 R ² =.0210
With Children	-.046***	.007	.000	
	(.002)	(.005)	(.004)	N=98,275 R ² =.0243

Note: In addition to variables listed, the model included state fixed effects, year fixed effects, education, race, marital status, and employment status. * indicates significance at the .10 level, ** indicates significance at the .05 level, and *** indicates significance at the .01 level. All standard errors, listed in parentheses, are robust standard errors.

For females, there are decreases of 6.7% and 4.6% for those without children and with children, respectively, resulting from living in an expansion state. While the magnitude of these changes is smaller than magnitude of the changes for men, the decrease is likely resulting from the same reason as males.

The post variable for females shows slight decrease of .01% for those without children and .07% increase for those with children. Neither of these percentages are statistically significant from 0. Generally, this shows that seat belt use is at least increasing over time, although there may be no change.

The expand post variable for females is not statistically significantly different from 0, much like for males. However, for females with children, expand post is effectively

equal to 0 after rounding. This shows that there is evidence to indicate that Medicaid has no impact on the health behaviors of females with children.

Overall, the results indicate that there is little evidence to suggest that low-income individuals are engaging in riskier behavior at a higher rate in expansion states because of the Medicaid expansion.

DISCUSSION

Because moral hazard controls cannot be imposed on the insured individual covered by Medicaid, the results of this paper indicate that, on the national level, ex-ante moral hazard is not an issue. There is evidence to suggest that there is no increase in risky health behavior resulting from the expansion of Medicaid.

The significantly lower rates of seatbelt use for childless males and females in expansion states compared to non-expansion states is difficult to concretely explain. The results may have been skewed by the relatively small sample size in some states, but further study would be required to identify an appropriate explanation for this difference. Increasing seat belt use over time, which is suggested by the “post” variable, is an outcome which individuals will likely find positive, but further study will also be required here to identify the cause of this success.

Understanding the reason why there is no evidence to indicate a moral hazard effect is important to policy makers as they try to understand what aspects of Medicaid policy have been successful. The lack of ex-ante moral hazard in this sample can be explained in-part by the principal-agent problem. Physicians, as agents of their patients, have a larger responsibility for health care costs than patients, because physicians

control most medical expenditures. In many cases, as a part of managed care, physicians are reimbursed a fixed amount per patient, called a capitation payment. This payment is meant to control costs, moral hazard and reduce supplier-induced demand. Medicaid, along with numerous other private insurance plans, uses capitation payments for this purpose. However, Medicaid has relatively low capitation payments compared to these private insurance plans. As a result, physicians are often less likely to take on new Medicaid patients, and, when they do, there is an incentive to provide as few services as possible (Decker, 2012). With significant difficulty accessing care because physicians choose not to take on new Medicaid patients and, when they do, they usually do not prescribe large volumes of care, individuals insured by Medicaid cannot afford to take unnecessary risk, because accessing treatment is difficult. While ease of access varies by state, this would help to explain the lack of evidence of a moral hazard effect in this study.

An additional explanation for the lack of evidence of moral hazard is that of the 14.5 million new individuals covered by Medicaid, some may have been previously covered by private insurance. The ACA, in addition to allowing more people to join the program based on income, allowed individual states to improve the quality of their Medicaid programs, which may result in Medicaid crowd-out. If this is the case, then some portion of the individuals covered by Medicaid would not be new to an insurance plan. These individuals would likely have established behaviors that would not change when they switched between a low-quality private plan and a low-quality public plan. Ex-ante moral hazard would not develop because the level of quality would be consistent despite the change in insurance provider. The extra income saved by not having to pay

for the individuals own premium, co-payment, or deductible would likely not be enough to induce a change in behavior because the low-quality nature of the plan they are leaving is likely associated with a small cost. The result would be only a small increase in disposable income, except in cases of catastrophic illness or injury.

There is some evidence to indicate that, in some states, Medicaid does induce covered individuals to utilize more care. This is unsurprising, as one of the most common reasons for not accessing care is the cost associated with it. Additional factors include the ease of access to care, which was not addressed by the Medicaid expansion provision of the 2010 ACA. The Oregon Health Insurance Experiment, for example, showed that there was a 40% increase in emergency department visits in covered individuals when compared to those eligible for Medicaid who were not covered (Finkelstein et al 2012, Taubman et al 2014). While this would appear to be a moral hazard effect, it is possible that this can be explained by the relative difficulty individuals have accessing primary care through Medicaid. Because physicians are willing to take on so few new Medicaid patients, this could be explained by many patients receiving care through emergency departments instead of through a primary care physician. The capitation paid by the government to providers, usually through managed care organizations but sometimes directly through fee-for-service from the state, is often a fraction of the rate that provider would receive from a private insurance company. In some cases, for some services, the government payment rate may be less than the cost to provide the service. This may induce some primary care providers to limit the number of new Medicaid patients they will take, as it may be done at a net loss. With the relative difficulty in accessing primary care, many patients may wait until their need for medical

care becomes an emergency or may treat the emergency room as a primary care office, inefficiently overutilizing emergency care. Regardless, if any of these are the case, the inelastic demand for emergency medical care would result in little, if any, moral hazard. The expansion of Medicaid, while it increased the number of individuals who had insurance and could access care, did not address the structural barriers that exist to accessing care in the system, especially for those who are publicly insured. This would help to explain the lack of evidence of ex-ante moral hazard. If patients know that the majority of their care is going to come only in an emergency, it is likely that they would not have riskier health behavior once becoming insured because of the significant loss of utility from being in an emergency room. The lack of evidence to indicate moral hazard, found in this study, would support the idea that the observed increase in utilization in Oregon and across the country is not the result of moral hazard.

LIMITATIONS & FUTURE STUDY

The BRFSS, while an accessible and relatively simple to use data set, has limitations based on the methods used to collect data. By basing the survey on responses from land-line and cellular telephones, the results may inadvertently exclude the poorest portion of the population, as these individuals may not possess these methods of communication at as high a rate as wealthier people. This is particularly problematic for this study because the focus of the investigation is the very poor.

While most Americans ride or drive regularly in a car, but the poorest Americans are the most unlikely group for this to be true (Tomer, 2011). Therefore, by using seat belt usage to measure risky health behaviors, the poorest individuals, who would also be affected by the Medicaid expansion, may have been excluded because seat belt use

may not affect them. Furthermore, the BRFSS does not include any questions asking the specific source of an individual's health insurance coverage, if any. This necessitates the assumption that everyone who qualifies for Medicaid is enrolled in the program, which is not likely to be true. The assumption was based on the reported income of a respondent, and because the reported income is broken down into categories which sometimes include both individuals who do and do not qualify for Medicaid, this assumption is inherently flawed.

Additionally, there is a limited amount of data after the expansion took effect. As more data becomes available, the analysis should be repeated so that the effects can be more accurately determined. Because states are free to decide the quality and quantity of the Medicaid program in their state, there is no true "one size fits all" measurement of qualifying for the program. Ideally, this study would be repeated once more data becomes available for all 50 states, and would be designed in a way such that each states' unique qualifications for the program were included.

While seat belt usage may be an effective way to determine the how risky an individual is regarding his or her health, it may not be the best measure of moral hazard. The link between the consequences of wearing or not wearing a seat belt on an individual's health is not as clear as the link would be for smoking or drinking behavior. Seatbelt use is also habitual—it may be unlikely that an individual would change this health behavior because they became insured. The lack of evidence for moral hazard could be due to the choice of the dependent variable, and not because the program is truly designed in a way that limits ex-ante moral hazard.

CONCLUSION

Moral hazard in Medicaid poses a significant problem for policy makers. Typical moral hazard controls, such as co-payments and deductibles, cannot be used in Medicaid because the intended recipients of the benefit are very poor, and as such are unlikely to be able to afford these payments. The likely result would be underutilization of care, which is socially undesirable in the same way that overutilization due to moral hazard would be socially undesirable. Medicaid is thought to improve health outcomes, which is something that society values. Balancing the quality of the program with the need for an efficient use of public dollars is a key issue for policy makers, and avoiding a program which creates moral hazard by increasing risky health behavior in a way which makes needing treatment more likely is a key part of creating this efficiency. The results of this study indicate that seat belt use in low-income populations is increasing over time, and that there is little evidence to indicate that there is an ex-ante moral hazard effect resulting from the Medicaid expansion.

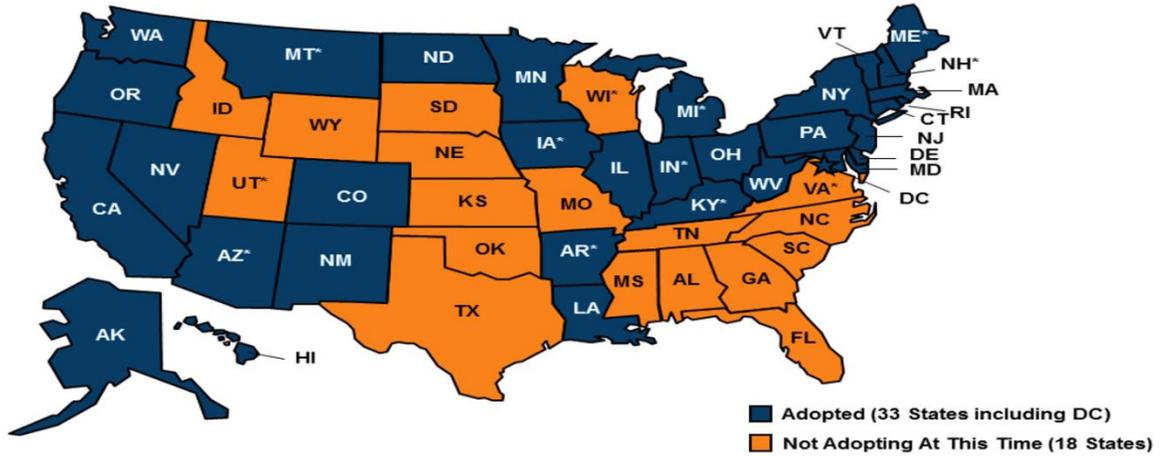
APPENDICES

Appendix A: Map of the Current Status of the Medicaid Expansion, courtesy of the Kaiser

Family

Foundation

Current Status of State Medicaid Expansion Decisions



NOTES: Current status for each state is based on KFF tracking and analysis of state activity. *AR, AZ, IA, IN, KY, MI, MT, and NH have approved Section 1115 expansion waivers. VA is considering adopting expansion in their FY 2019 state budget and UT passed a law directing the state to seek CMS approval to partially expand Medicaid to 100% FPL using the ACA enhanced match; see the link below for more detail. CMS approved the Kentucky HEALTH expansion waiver on January 12, 2018; implementation will begin in April 2018. ME adopted the Medicaid expansion through a ballot initiative in November 2017; the ballot measure requires submission of a state plan amendment (SPA) within 90 days and implementation of expansion within 180 days of the measure's effective date; however, the governor failed to meet the SPA submission deadline (April 3). WI covers adults up to 100% FPL in Medicaid, but did not adopt the ACA expansion.

SOURCE: "Status of State Action on the Medicaid Expansion Decision," KFF State Health Facts, updated April 5, 2018.
<https://www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/>



Appendix B: Sample Regression (Men without Children)

Linear regression

Number of obs = 108,003

F(19, 41) = .

Prob > F = .

R-squared = 0.0293

Root MSE = .29404

	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
seatbelt						
expand	-.1126786	.0038759	-29.07	0.000	-.1205061	-.1048511
post	.0265936	.009998	2.66	0.011	.0064023	.0467849
expandpost	-.0067769	.0077715	-0.87	0.388	-.0224718	.008918
_lstatea4	.0635656	.0027888	22.79	0.000	.0579335	.0691977
_lstatea5	.0595242	.0017741	33.55	0.000	.0559414	.063107
_lstatea6	.1456373	.0039083	37.26	0.000	.1377444	.1535302
_lstatea8	.0796524	.0022194	35.89	0.000	.0751702	.0841346
_lstatea9	.1117737	.0022036	50.72	0.000	.1073235	.1162239
_lstatea10	.1466495	.0024815	59.10	0.000	.141638	.151661

_Istatea12	-.0069787	.0020262	-3.44	0.001	-.0110706	-.0028867
_Istatea13	-.0203985	.0009816	-20.78	0.000	-.0223809	-.0184162
_Istatea15	.1397264	.0038957	35.87	0.000	.131859	.1475938
_Istatea16	-.0658371	.0031785	-20.71	0.000	-.0722562	-.0594181
_Istatea17	.1164988	.00273	42.67	0.000	.1109854	.1220122
_Istatea19	.1261013	.0006692	188.43	0.000	.1247498	.1274528
_Istatea20	-.0561063	.0022041	-25.45	0.000	-.0605576	-.0516549
_Istatea21	.0727147	.0015112	48.12	0.000	.0696628	.0757666
_Istatea24	.1342141	.0037067	36.21	0.000	.1267282	.1416999
_Istatea25	-.0035511	.0014633	-2.43	0.020	-.0065063	-.0005959
_Istatea27	.1240281	.0006944	178.62	0.000	.1226258	.1254305
_Istatea28	-.0310193	.0017687	-17.54	0.000	-.0345912	-.0274474
_Istatea29	-.1339456	.0019	-70.50	0.000	-.1377828	-.1301084
_Istatea31	-.1515018	.0023475	-64.54	0.000	-.1562427	-.1467609
_Istatea32	.0954327	.0025652	37.20	0.000	.0902521	.1006132
_Istatea34	.1181497	.003282	36.00	0.000	.1115216	.1247778

_lstatea35	.1294629	.0044083	29.37	0.000	.1205601	.1383656
_lstatea36	.1046654	.0027112	38.60	0.000	.09919	.1101407
_lstatea37	.0305319	.0010908	27.99	0.000	.0283291	.0327348
_lstatea39	.0295563	.001374	21.51	0.000	.0267814	.0323311
_lstatea40	-.0125714	.0020058	-6.27	0.000	-.0166223	-.0085205
_lstatea41	.1513114	.0013451	112.49	0.000	.148595	.1540278
_lstatea44	.0717797	.0018958	37.86	0.000	.0679511	.0756083
_lstatea45	.0086944	.0006018	14.45	0.000	.0074791	.0099098
_lstatea46	-.1858925	.0028236	-65.84	0.000	-.1915949	-.1801901
_lstatea47	-.0214432	.0018385	-11.66	0.000	-.0251561	-.0177303
_lstatea48	.0158675	.0035842	4.43	0.000	.008629	.023106
_lstatea49	-.0519991	.0028257	-18.40	0.000	-.0577057	-.0462926
_lstatea50	.0435969	.000906	48.12	0.000	.0417673	.0454265
_lstatea51	-.0465486	.0009402	-49.51	0.000	-.0484475	-.0446498
_lstatea53	.1487252	.0014036	105.96	0.000	.1458905	.1515598
_lstatea54	.048686	.0013846	35.16	0.000	.0458899	.0514822

_lstatea55	-.0759556	.0022212	-34.20	0.000	-.0804414	-.0714698
_lstatea56	-.1482124	.0028463	-52.07	0.000	-.1539606	-.1424642
_lyeara2011	.0162609	.0104624	1.55	0.128	-.0048684	.0373901
_lyeara2012	.0129174	.0085699	1.51	0.139	-.0043897	.0302246
_lyeara2013	.0124172	.0105863	1.17	0.248	-.0089624	.0337967
_lyeara2014	-.0100759	.0073864	-1.36	0.180	-.0249931	.0048413
_lyeara2015	.0027875	.005393	0.52	0.608	-.0081039	.0136788
black	.0055657	.0096162	0.58	0.566	-.0138546	.0249859
otherrace	-.0032393	.007377	-0.44	0.663	-.0181374	.0116588
multirace	.0027165	.0119041	0.23	0.821	-.0213243	.0267572
hispanic	.0291738	.0085662	3.41	0.001	.011874	.0464736
divorced	-.0139387	.0049077	-2.84	0.007	-.0238499	-.0040275
widowed	.0055927	.0075849	0.74	0.465	-.0097254	.0209108
separated	-.0163073	.0066949	-2.44	0.019	-.0298279	-.0027867
never	-.0261657	.0047525	-5.51	0.000	-.0357636	-.0165678
othermarital	-.0021532	.0068607	-0.31	0.755	-.0160087	.0117022

hsgrad	.0133827	.0053735	2.49	0.017	.0025307	.0242346
college	.0381487	.0067024	5.69	0.000	.024613	.0516844
collegegrad	.0570446	.0088675	6.43	0.000	.0391363	.0749529
unemploy	.0059527	.0042666	1.40	0.170	-.0026638	.0145692
_cons	.8830746	.0124165	71.12	0.000	.857999	.9081503

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