

**AN ASSESSMENT OF THE ANNUAL INSURER FEE ON MEDICAID  
BENEFICIARIES AND HEALTH OUTCOMES: AN ANALYSIS OF DIABETES  
PREVALENCE<sup>1</sup>**

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**Executive Summary**

The 2010 Affordable Care Act (ACA) seeks expansion of insurance coverage to 40% of the US uninsured adult population under the age 65. An estimated 26 million people are expected to gain insurance through Medicaid expansion and the remaining through private insurance in 2014. A key provision of the ACA is the annual fee on health insurers, serving as a tax. Studies on how this tax would affect the market, in particular the Medicaid Managed care Plans (MMCPs), are practically nonexistent due to the newness of this policy mandate and an absolute lack of empirical data observations. Early forecast reports that were made available failed to include the potential impacts on these MMCP's specifically. Therefore, this study reviewed a large number of related past studies and estimated an empirical regression model based on 2003-2010 annual panel data of US states to infer possible implications of the annual fee on Medicaid beneficiaries with particular emphasis on diabetes mellitus prevalence. Results from random effects regression model estimates, among other findings, confirm that the Medicaid enrollment rate, Medicaid spending per beneficiary and the interaction effects of these variables have significant adverse health outcomes on Medicaid patients, leading to substantially higher treatment costs. This would be in addition to increased costs due to the annual fee on MMCP's. Moreover, it may incentivize states to avoid contracting with these managed care plans which have been shown to positively impact health outcomes for Medicaid patients. Specifically, the empirical evidence in this study shows that rising MMCP penetration rates reduce the diabetes prevalence rates significantly. Implications of these findings suggest potentials for worsening of health outcomes for the low income population segment, that the ACA is designed to protect, as a result of the annual insurer fee provision.

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# **AN ASSESSMENT OF THE ANNUAL INSURER FEE ON MEDICAID BENEFICIARIES AND HEALTH OUTCOMES: AN ANALYSIS OF DIABETES PREVALENCE**

## **I. Introduction**

The 2010 Patient Protection and Affordable Care Act (ACA) represents the largest health system change in decades. A core provision of the ACA is expanding Medicaid coverage in 2014 to adults with incomes up to 133% of the federal poverty level, or about \$15,550 for a single adult in 2014 (Ayanian, 2013).<sup>2</sup> Health insurance reforms within the ACA are expected to impact significantly on the healthcare industry structure, conduct and performance, including those of the insurance carriers.<sup>3</sup> More specifically, beginning 2014 under the ACA, there will be an annual fee, serving as a sales tax, on revenues from the sales of health insurance plans and third party administrator fees.

Currently, studies on how the fee on insurers would affect the market, in particular the Medicaid Managed Care Plans (MMCPs), is practically nonexistent due to the newness of this policy mandate and an absolute lack of historical data on which to base empirical studies. Despite this, some existing reports and articles shed some light on the possible impact of this fee levied on health insurers of MMCPs. We first review and summarize the key points in these articles, and then search more general economic literature on taxation theory and empirical work to provide the theoretical framework for

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<sup>2</sup> Nationally, as of 2013, 40% of the US adults under age 65 years are uninsured.

<sup>3</sup> Major changes planned to occur under ACA in the private insurance market are the individual mandates, employer requirements, new insurance regulations (e.g., minimum medical loss ratio requirement and a number of taxes and subsidies), and health insurance exchanges.

the research. Following, utilizing a random effects regression model, this study demonstrates the negative impact this fee could have on diabetes prevalence and cost of care. These results are new and timely, having not been accounted for in previous US Congressional Budget Office (CBO) report estimates.

The report proceeds as follows. Section II provides a comprehensive review of related literature. Section III describes the data for our empirical investigation. Section IV discusses the empirical regression model results and findings. Section V covers further discussions, implications and concluding remarks.

## **II. Literature Review**

### **II.1.1 Estimated financial impact**

A Marwood Group report (2011) points out that while the CBO appears to have accounted for the effect of the insurer fee on premiums for the commercial health plans and health plans in the Exchange, it does not appear to have explicitly accounted for the cost of the fee to the Federal Government as a consumer or payer of premiums for Medicare Advantage and MMCPs. As such, Congress was not provided with an estimate of the potential cost to states and the federal government.

An Oliver Wyman report prepared by Carlson (2012) projected that the ACA health insurance fees would increase the average cost of Medicaid coverage by about \$1523 per enrollee between 2014 and 2023. A Milliman report (Meerschaert and Doucet, 2012) estimated that the fee will raise Medicaid managed care premiums between 1.5% and 1.6% on a nationwide basis, with some states expected to see increased premiums of

up to 2.5%. State and federal government funding for the increase in Medicaid managed care premiums related to the health insurer fee will be between \$36.5 billion and \$41.9 billion over ten years, with between \$13.0 billion and \$14.9 billion of that increase in total funding paid by state governments and between \$23.5 billion and \$27.1 billion paid by the federal government.

### **II.1.2 Impact on Medicaid benefits, costs, health outcomes and care quality**

Medicaid coverage of the currently uninsured millions of the US adults under the PPACA mandates is designed to expand access to care, raise health care intervention outcomes, and reduce medical indebtedness to improve financial well-being of covered individuals and their families. However, Carlson (2011) expected that levying the insurer fees would put pressure on the already-strained Medicaid budgets, resulting in decreased benefits to Medicaid beneficiaries and therefore defeat the ACA's intended goals for the Medicaid population. While Van de Water (2013) argued that managed care accounts for only about 20% of Medicaid spending, and about 1 in 5 Medicaid beneficiaries enrolled in MMCP are enrolled in a plan not subject to the tax, the Centers for Medicare and Medicaid Services (CMS), according to its 2010 Medicaid Managed Care Enrollment report, states that over 71% of Medicaid beneficiaries are enrolled in a managed care plan. However, there is an increasing trend in the share of MMCPs. According to Meerschaert and Doucet (2012), many states are expanding enrollment in existing or new MMCPs.<sup>4</sup>

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<sup>4</sup> A large number of states are not expanding Medicaid, opting instead for a private insurance market-based approach to accommodating the low-income uninsured to accommodate PPACA provisions. While the extent to which the PPACA mandates will be achieved under this scheme is uncertain, a recent study at George Washington University estimates that 518 health centers in more than half of the 50 US states (MS and AL are hugely affected) not expanding Medicaid stand to lose \$555 million in 2014

Managed care organizations (MCOs) are designed to be cost-effective health care insurance mechanisms for the delivery and financing of a comprehensive set of health and medical services to covered lives. Similar to the ACA provisions, and contrasted with the more costly traditional fee-for-service indemnity insurance plan models, the MCOs seek attainment of their design objectives through coordinated deliveries of a broadly ranged set of preventive care to covered lives in ways that would significantly obviate the need for more costly future interventions. Many laws<sup>5</sup>, passed largely in response to critics of MCOs, have also influenced the cost, quality, and health outcomes in Medicaid managed care plans (MMCPs). Miller and Luft (1997), after analyzing evidence from thirty-seven published peer-reviewed articles, found particular evidence on comparative care quality of the MMCPs to be scanty and that general evidence on MCOs compared with non-HMOs are mixed. Shen and Zuckerman (2005) found that increased Medicaid fees in general raised significantly the probability of a beneficiary having a usual and customary source of care that promotes quality of care outcomes.

Compared with the fee-for-service coverage, Decker (2009) found that reduced Medicaid fees reduced the number of physician visits and this resulted in worse health outcomes for Medicaid patients. Moreover, a review of published empirical studies (see, e.g., Artiga and O'Malley, 2005) found that imposing Medicaid cost-sharing conditions on beneficiaries either led to their dropping out of insurance coverage or reducing usage

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because their uninsured population would not receive Medicaid or federal subsidy for coverage in the newly open insurance marketplaces (Galewitz, 2013).

<sup>5</sup> Government regulations of MCO operations have motivations from 'public interest' or 'special interest groups'. These laws include, among others, anti-gag laws, laws restricting financial incentives of MCOs, laws promoting continuity of care, laws strengthening the rights of the health care professionals, etc. See, e.g., discussions in Santerre and Neun, 2013).

of medical care. The literature supports the contention that, compared with traditional fee-for-service plans, hospitalization rates are some almost 20 percent lower in MCOs, managed care generated cost savings with little quality of care attrition, increased HMO penetration rates in a market improved hospital production efficiencies, and inpatient outcomes are on par.

Rising Medicaid enrollments and the increasingly tight state budgets for the program make it imperative for states to seek cost containment avenues with improved outcomes. States expanding Medicaid to cover the uninsured under ACA, in contrast to those opting for the private insurance exchange market, are turning to MMCPs to provide care through integrated care coordination promoting wellness, for the medically complex and more costly, older and disabled population segments. Also, mental health and substance abuse coverage must be provided for these sub-populations under MMCPs.<sup>6</sup> To achieve the ACA policy goals for Medicaid eligible beneficiaries, MMCPs would in turn be paid a higher fee and co-pays of the premium paying enrollees are (almost) non-existent. These could lead to improved care quality, expand enrollments, and reduced average cost of care for the MMCPs, assuming that large enough numbers are enrolled and there are minimum adverse selection and moral hazard (that is, unnecessary over-use of limited healthcare resources by the insured) effects.

### **II.1.3 Tax incidence (ability to fully pass-through the tax to the state and federal governments)**

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<sup>6</sup> See, [http://www.medai.com/solutions/by-need/managing-medicaid-beneficiaries ...](http://www.medai.com/solutions/by-need/managing-medicaid-beneficiaries...)

It is expected that the tax on insurers would be passed through to consumers in the form of higher premiums. For MMCPs, several existing reports claimed that the tax would be fully passed through to the payers (state and federal governments) because of the principles of actuarial soundness, which requires that full costs of doing business, such as federal and state taxes, are considered when determining the premiums of MMCPs (Carlson, 2011; Meerschaert and Doucet, 2012). The Marwood Group (2011) added that factors such as lax federal oversight of actuarially sound rates, budgetary constraints, and market competition could reduce the amount of the annual insurer fee that is passed through to Medicaid programs, especially if states resist rate increases. Van de Water (2013) anticipated that states would likely be tough negotiators, given the tight budgets constraints, and unlikely to allow MMCPs to pass through the entire amount. Regulatory guidance is still lacking, at this point, as to the treatment of the insurer fee with regards to Medicaid rates.

#### **II.1.4 Competition**

Given the structure of the Medicaid market, MMCPs are competing with other Medicaid programs as well as MMCPs that are exempt from the tax. Tax induced premium increases would put MMCPs that are subject to the tax at a competitive disadvantage. Rather than otherwise choosing plans based on quality, outcomes, and costs, states may favor MMCPs exempt from the tax over those subject to the tax because of lower premiums (Meerschaert and Doucet, 2012; Marwood Group, 2011). This competitive disadvantage could harm MMCP's that potentially, for reasons previously discussed, help to improve health outcomes among Medicaid enrollees.

## **II.2 Economic Theory on Taxation**

Standard economic theory suggests that excise taxes discourage market activity. A tax on a good would result in a smaller quantity sold in the new equilibrium and buyers pay more for the good and sellers receive less for it. In the insurance market, a tax on insurers would discourage insurance purchases since consumers would pay more for the insurance premiums. Chernew et al. (2005) found that increases in health insurance premiums, for many reasons, in the 1990s resulted in more than half of the decline in coverage rates. A paper by Atherly et al. (2013) on Medicare + Choice plans showed the premiums have a significant effect on plan selection, with an estimated out-of-pocket premium elasticity of -0.134 and an insurer-perspective elasticity of -4.57.

Theories on taxation also suggest that the division of the tax burden (tax incidence) does not depend on whether the tax is levied on buyers or sellers. It depends on the differences in the price elasticities of demand and supply. A tax burden falls more heavily on the side of the market that is less elastic, because that side of the market can respond less easily to the tax by changing the quantity bought or sold (Mankiw, 2008).

A tax can also be transferred to production factors with no change in consumer prices (Oner, 2013). In the insurance market, though the ACA's mandates on insurance coverage would increase the total insurance plans sold, the pressure on cost caused by the annual insurer fee could translate into lower quality if the tax is not fully passed to consumers.

Taxes also generate welfare losses (deadweight losses) because they distort incentives. It is the reduction in economic well-being of taxpayers in excess of the amount of revenue raised by the government. It is the inefficiency that a tax creates as people allocate resources according to the tax incentive rather than the true costs and benefits of the goods and services that they buy and sell (Mankiw, 2008).

A recent study by Viaurox (2013) built a theoretical insurance model and analyzed the impact on societal welfare of imposing a tax on insurance payments in the presence of moral hazard using a Gamma conditional distribution of losses. It showed that any tax paid by the insured would lower his effort to prevent loss, hence increasing insurance payments and decreasing profits. The author also found that any decrease in the insurer's tax share would generate an overall decrease in welfare unless the insured characteristics prevent him from reacting to the policy. It implies that, if the insurers fully passed the tax to the consumers, the welfare would be the lowest compared to any tax sharing between the insurers and the insured. Thus, in the case of the annual fee on health insurers, there exist potential welfare losses through behavior changes of the beneficiaries.

### **II.3 Empirical studies on tax impact**

A thorough search in economics and business literature reveals that little work has been done on estimating the impact of an insurer tax on health insurance consumption and social welfare. However, empirical studies on other types of taxes and their estimates of the impact would shed light on the potential methodology we could use and possible outcomes we would expect.

A related study by Nivolas and Vera Hernandez (2008) investigated the impact of tax subsidies on the private health insurance market in Spain. They found the elimination of the subsidies to private policies did not generate a statistically significant increase in costs for the public sector. This result is driven by the fact that private insurance holders make concurrent use of public and private services, and by the price inelasticity of the demand for private policies. Chernick *et al.*, (1987) did another study on the effect of tax subsidy to employer-provided health insurance. They estimated that complete elimination of the favorable tax treatment of employer contributions to health insurance would reduce the demand for employer-sponsored health insurance by 16-27 percent and the overall demand for medical services by about 4-6 percent. Selden and Bernard (2004) investigated the distribution of burdens and benefits from employment-related coverage across worker characteristics and found the tax subsidy to be larger for higher income families than for poorer families, larger for older workers than younger workers, larger for workers in multi-person families than workers living alone, larger for non-Hispanic whites than for blacks or Hispanics, and larger for workers with above average health risks than those with below-average health risks.

Another popular topic on the impact of taxation relates to “sin” taxes. Those taxes are widely used as a public health policy tool to discourage the consumption of products or services that are seen as vices, such as alcohol, tobacco, soft drinks and fast foods. While the annual fee on health insurers is not a “sin” tax, we may still draw from past history with regards to the effects of these taxes due to their typically inelastic demand in at least short-run settings. Cigarette taxes, for example, have been studied extensively. Evans, *et al.* (1999) presented evidence of the likely impact of cigarette tax hikes on

consumers, governments, and producers. They showed that 100 percent of a tax hike was passed onto consumers in the form of higher prices due to the highly inelastic short-run demand, estimated as 0.30 to 0.50, with long-term elasticities 1.75 times the short-term values. DeCicca and McLeod (2008) investigated the responsiveness of older adult smoking using variation from historically large cigarette tax increases and found higher taxes reduced smoking participation by older adults, especially those who are less educated and live in low-income households. These findings run contrary to existing evidence which suggests that cessation behavior by older adults is not sensitive to price. White and Ross (2013) suggested that previous studies tend to overestimate the health impact of the tax and distort the price elasticity estimates if neglecting smokers' substitutes. Finkelstein et al. (2013) studied implications of a sugar-sweetened beverage (SSB) tax when substitutions to non-beverage items are considered. They found that the tax would result in a decrease in store-bought energy of 24.3 kcal per day per person, or an average weight loss of 1.6 pounds during the first year and a cumulated weight loss of 2.9 pounds in the long run. Wagenaar, *et al.* (2009) conducted a meta-analysis of 1003 estimates from 112 studies on alcohol beverage tax and concluded raising prices of alcohol are an effective means to reduce drinking. Simple means of reported elasticities are -0.46 for beer, -0.69 for wine and -0.80 for spirits. Additional literature on soft drink taxes can be found in the appendix.

Some studies also provide analyses on tax avoidance. DeCicca *et al.* (2013), for example, constructed a model to investigate the cigarette tax avoidance and showed that consumers respond to the incentives created by excise tax differentials across states.

Their illustrative calculations suggested that some states may already impose cigarette excise taxes that are higher than optimal.

Literature on the behavior effects of taxation also includes topics related to labor market outcomes. For example, Bruce and Mohsin (2006) investigated how a range of taxes ( federal income, payroll, capital gains, corporate income and estate taxes) affects self-employment. They showed that most of these taxes had significant but small effects on self-employment activities. Gurley-Calvez (2011) looked at whether the self-employed would stay in business given the changes in health insurance deductibility and found that households claiming deductions are indeed less likely to exit self-employment.

The empirical evidence on the extent to which taxes are passed-through to prices is mixed. Kenkel (2005) found that alcohol tax hikes are more than fully pass-through (over-shifted) to consumers. Besley and Rosen (1989) studied 12 commodities and found evidence of tax over-shifted in more than half of the commodities they studied, and fully pass-through in competitive markets for products like Big Macs and eggs. Poterba (1996) used earlier data from 1920s to 1940s and found retail prices rise by approximately the amount of the sales tax in postwar period and clothing prices appear to rise by only two-thirds of the amount of sales taxes in the Depression period. Clausing (2013) examined the incidence of corporate tax in a global economy and found no robust link between corporate taxation and wage.

There are also empirical studies that estimate the deadweight loss of taxation. Feldstein (1995) studied the deadweight loss of an income tax and found repealing the 1993 increase in tax rates for high income taxpayers would reduce the deadweight loss of

the tax system by \$24 billion while actually increasing tax revenue. Goolsbee (1998) estimated the deadweight loss of corporate income tax is around 5–10% of revenue using 1900-1939 data.

While there is no historical evidence specifically related to the health insurance sales tax to allow for direct observational analysis, inferences may be made regarding the effects taxes have had on other markets. From evidence cited above, it is expected that the burden of the annual fee on health insurers will fall heavily on consumers. Specifically, with regards to MMCP's, the burden would fall on state and federal governments. The division of this burden between state and federal governments would depend on the setup of each individual state's Medicaid programs (e.g. Medicaid expansion, federal poverty limit, benefits covered, etc.). This may impact the choice of states government to utilize managed care and, following, the quality of the healthcare purchased and outcomes amongst the beneficiary population. A summary table of cited literature in this section is presented in Table III appendix of this report.

### **III. Data and Descriptive Statistics**

The key variable of interest for this study is the prevalence rate of diabetes. Obtained from the Center for Disease Control (CDC), it is capture here by state and year from 2003 – 2010. Diabetes has been and continues to be a growing national health concern, with high prevalence rates amongst historically medically underserved populations (poor, minorities, etc.). These underserved population groups are many times the same people that are targeted by Medicaid (Blustein, 2011). However, with implementation of the health insurance sales tax set to begin in 2014, it is unclear how the health of those

covered under the Medicaid assistance program may be affected as a result of this increased cost burden.

To investigate this issue, this research looks specifically at the roles the Medicaid enrollment rates and spending per enrollee with regards to the health outcome of interest, diabetes. Published by the Center for Medicare and Medicaid Studies (CMS), this study includes both the enrollment rate and spending per beneficiary at the state level, captured annually. While the quality of Medicaid spending is likely to influence health outcomes, it is also possible that higher diabetes rates could lead to increased spending. To control for the potential endogeneity issues, lagged terms for both enrollment and spending are utilized here. Further, to account for other potentially influential factors relating to the diabetes prevalence rate, additional demographic, socio-economic, and supply-side controls are included.

With the data acquired from the US Bureau of Economic Analysis, income effects are controlled for with the inclusion of real GDP per capita. However, to account for potential endogeneity issues once again, lagged terms are used in the analysis. Additionally, the total of physician office employees, by state and year, is included as a proxy for supply side influence. This measure accounts for not only the number of physicians, but also their staffing needs to match treatment patterns. Taken from the US Bureau of Labor Statistics, this separates any latent physician-induced consumer demand from the remainder of the model.

To control for the effect of other forms of insurance coverage for the remaining population, the models contain the total HMO penetration rate and the percentage of the

uninsured population. The uninsured population data are taken from the US Census Bureau, while the HMO data are from *statehealthfacts.org*, published by the Kaiser Family Foundation.

Also utilized within the models is the percentage of population age 65 and older, obtained from population estimates published by the U.S. Census Bureau. This controls for not only the effects of an aging population, but also the potential impact of Medicare enrollment. Lastly, following Cuckler *et al.* (2011), the models multiply the smoking rate by the obesity rate in each state (value adjusted into a percentage). This bad health index accounts for possible ill health effects, such as diabetes. While certainly not all people diagnosed with diabetes are obese and smoke, it serves also as a general health index for the population within the specific observation. The smoking and obesity rates data are from the Prevalence and Trends Data of the Behavioral Risk Factor Surveillance System (BRFSS). Table 1 presents the descriptive statistics of key variables within the models.

**Table I: Descriptive Statistics of the Data**

<i>Variable</i>	<i>Mean</i>	<i>Std. Error</i>
Diabetes Prevalence	8.38	1.91
Amount Per Beneficiary <sub>lag</sub>	5266.51	1384.52
Medicaid Enrollment Rate <sub>lag</sub>	13.69	3.81
Bad Health <sub>lag</sub>	5.16	1.32
HMO Penetration Rate	17.74	11.65
% $\geq$ 65 years	12.90	1.72
	40879.78	7545.90

Real GDP per Capita <sub>lag</sub>		
% Uninsured	15.70	4.38
Physician Office Employees	43707.56	46199.64

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## IV. Empirical Model and Results

### IV.1 Empirical Model

To capture the impact of the above variables, the prevalence of diabetes ( $DIAB_{it}$ ) takes the following Random Effects GLS form:

$$DIAB_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 S_{it} + \beta_3 (M * S)_{it} + \beta_4 X_{it}^Q + u_{it} \quad (1)$$

where  $X_{it}$  denotes a vector of controls for state level health insurance coverage, HMO penetration rate, bad health, state, time, and other supply and demand effects.  $M_{it}$  and  $S_{it}$  denote the Medicaid enrollment rate and spending per beneficiary, respectively, for state  $i$  in year  $t$ . An interaction term between the enrollment rate and spending per beneficiary is included to further account for how the two might work together in their influence on diabetes prevalence.

### IV.2. Empirical Results

There are alternative estimators when applying a panel regression model to observed data. This study is based on 2002-2010 annual data for the 50 US states (i.e., 450 observations). Consequently, we estimated, as alternatives, fixed-effects and random effects Generalized

Least Squares (GLS) regression models.<sup>7</sup> Conducting the Hausman specification test (Judge, *et al.*, 1985), the result<sup>8</sup> confirms the dominance or superiority of the random effects model, and so it becomes the basis of the empirical model discussions in this research.

As seen below in Table II, the Medicaid enrollment rate, the Medicaid spending per beneficiary and the interaction of the two variables all have statistically significant impacts on diabetes prevalence of the Medicaid enrollees. Specifically, the enrollment rate and spending per person both appear to increase the bad health outcome measure, with only a slight decrease coming from the interaction of the two. As such, the evidence suggests that increased enrollment combined with higher costs for Medicaid enrollees could negatively affect the health of this population, including many low-income women, children and minorities. As cited earlier from related examples, this is likely to happen if quality is negatively affected due to increased financial stress and separation of costs and beneficiaries.

Controlling for the coordination of the financing and delivery of medical care, the HMO penetration rate is also statistically significant, and decreases the diabetes rate. It is reasonable to expect that greater use of managed care has the potential to decrease

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<sup>7</sup> Moreover, we experimented with other plausible models, such as the two-way error components model (ECM), in addition to the Instrumental Variables (IV) and Heckman Two-Step models. However, these other results are not as theoretically and empirically tractable as the random-effects model reported here. The other model results are available on request from the authors.

<sup>8</sup> The Hausman specification test is a standard approach for differentiating between fixed and random effects models in panel data regressions. The  $\chi^2$  test results indicate that the random effects model is preferred as it is both consistent and efficient in the econometric or statistical sense. This means that the difference in coefficients of the fixed and random effects model is systematic and the random effects model dominates.

diabetes prevalence through more coordinated care. This is further supported by the decreased associated with the population percentage at or above age 65 years that are likely to obtain greater access to care as a result of Medicare health insurance coverage.

**Table II: Random Effects GLS Estimates**

<i>Variable</i>	<i>Coeff</i>	<i>Std. Error</i>
Amount Per Beneficiary <sub>lag</sub>	0.0008***	.0003
Medicaid Enrollment Rate <sub>lag</sub>	0.2488**	.1039
Amount * Enrollment Rate <sub>lag</sub>	-0.0001***	.0000
Bad Health <sub>lag</sub>	0.1353	.1881
HMO Penetration Rate	-0.0235*	.0133
% ≥65 years	-0.8562**	.3812
Real GDP per Capita <sub>lag</sub>	-0.0001*	.0001
% Uninsured	0.0209	.0426
Physician Office Employees	-0.0000	.0000
Constant	19.8401***	6.587

*Note:* 1. Complete descriptions of the variables in this model are given in Table I.  
 2. Statistical significance level: \*:10%, \*\*: 5%, \*\*\*:1%.  
 3. Number of observations is 354.

The population percentage uninsured, interestingly, does not have a statistically significant impact on the rate of diabetes.

## **V. Further Discussions, Implications, and Summary**

The health insurance sales tax included within the 2010 Patient Protection and Affordable Care Act is designed as a funding source for other provisions within the legislation, such

as subsidies for individuals to purchase health insurance. This is designed to increase enrollments in health insurance plans and, as a result, remove many of the financial barriers to healthcare access. Such access could potentially increase health status among vulnerable, low-income uninsured population groups and decrease national healthcare expenditures in the long run. However, as revealed in this study, using both empirical data modeling and anecdotal evidence from other studies (see, Appendix Table 1 Summary), the impact of this tax on state-run, government funded Medicaid programs could result in reduced health outcomes, especially in diabetes (and possibly related) care, for the historically underserved populations.<sup>9</sup> Surprisingly, this conclusion is in line with the most recent evidence in some studies of insurance coverage rollout in other countries (see, Fink, Robyn and Sauerborn, 2013) leading to atrophied health outcomes (because of adverse selection) including a rise in population segment-specific mortality rates.

Higher taxes on insurance benefits or premiums would translate to higher out-of-pocket cost for the poor population segment. Some researchers estimated the number of individuals to obtain insurance coverage due to ACA to be 26 million, with 70 percent of them through Medicaid (Buettgens and Carroll, 2012). If the individual and family tax penalty from being uninsured is less costly than the rise in insurance premium due from premium taxation, then the rational decision maker would opt for payment of the tax liability.<sup>10</sup> This, due to more uninsured not seeking out preventative services, could raise

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<sup>9</sup> Many states are enrolling newly covered adults in private managed-care plans, with health savings accounts funded by enrollees or their employers to cover cost sharing (see, for example, Ayaniam, 2013).

<sup>10</sup> For the large segment of health insurance premium paying Medicaid population with low incomes, lacking insurance coverage in 2013 would lead to an income tax penalty of \$695 per person (up to a maximum of \$2,085 per family) or 2 percent of household

presentations of the uninsured at the emergency department of hospitals and lead to higher treatment costs to individuals and the society. This represents greater health care expenditures for co-morbidities that could have been avoided if the uninsured were to have been insured and obtained usual and customary care, as well as possible increases in mortality rates<sup>11</sup>. This scenario would be consistent with the earlier studies of how the transition from an insured to uninsured status affects health care consumption.<sup>12</sup> More specifically, a limited study based on Oregon Medicaid implies that one year following Medicaid insurance disenrollment and no subsequent health insurance enrollment resulted in substantial reductions in health care ranging from primary and preventive care to hospitalization (Finkelstein *et al.*, 2011).

Given the expected increase in Medicaid premiums per enrollee, findings of this study imply that, combined with expanded enrollment, the rate of diabetes is likely to increase. This is a condition that disproportionately affects population groups for which the Medicaid insurance program exists to assist. In 2003, the first year of the study, one of every seven people in the U.S. with diabetes was enrolled in Medicaid. Further, 6% of the Medicaid beneficiaries were diagnosed with diabetes, costing approximately \$17,000 per person annually in 2003 (Cohen, 2007). The rise in poor health outcomes is possible if, with greater budget strains from increases in enrollment and costs per beneficiary, the

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income, whichever is greater. The penalties are expected to be phased in from 2014 to 2016 (see, Santerre and Neun, 2013).

<sup>11</sup> Stillman (2013), in a “Perspective” case study recently published in *The New England Journal of Medicine*, wrote of the clinical experience of patient death due to poverty-induced lack of insurance and delayed medical care which could have averted the untimely colorectal cancer death of the case study patient. Many more real life cases, such as this, occur daily across the US medical care provider industry segments.

<sup>12</sup> See, also, Anderson *et al.* (2010).

coordination and quality of Medicaid spending is impaired. Though the evidence presented here illustrates the positive impact of managed care on decreasing the prevalence of diabetes, the individual states might be dissuaded from utilizing managed care for Medicaid enrollees due to substantial increases in cost per person resulting from the annual health insurer fee provision. These results are quite timely, as they have been lacking in previous CBO reports.

According to a study published by the United Health Group (2010), diabetes in the general US population and among especially the income poor is projected to cost \$3.35 trillion and account for roughly 10 percent of total health care cost by 2020. Therefore, this study investigated the potential effect of the proposed insurance premium tax, under the ACA, on one health condition, diabetes, for Medicaid insurance program enrollees. However, it stands to reason that other ill health outcomes, directly or indirectly related to diabetes (e.g., obesity, gastro-esophageal reflux disease, cancers, clinical depression, chronic renal failure, congestive heart failure, etc.) could increase as well with implementation of this provision. Prevalence of these diseases in turn would likely raise inpatient and outpatient health care costs and utilization of related co-morbidities. On this note, further research is needed to provide a greater understanding of the complete impact this tax may have on population health and, as a result, national healthcare costs.

## References

- Anderson, M. *et al.*, 2010. The effect of health insurance coverage on use of medical care, *NBER Working Paper No 15823*. Cambridge, MA: NBER.
- Artiga, S. and O'Malley, M. 2005. Increasing premiums and cost sharing in Medicaid and SCIP: Recent state experiences. *The Kaiser Commission on Medicaid and the Uninsured*.
- Atherly, A., Dowd, B.E. and Feldman R. 2004. The Effect of Benefits, Premiums, and Health Risk on Health Plan Choice in the Medicare Program. *Health Services Research*, 39(4 Pt 1): 847–864.
- Ayanian, J.Z. 2013. Michigan's approach to Medicaid expansion and reform. *New England Journal of Medicine*, 365 (November): 1773-75.
- Besley, T. J., and Rosen, H.S. 1999. Sales Taxes and Prices: An Empirical Analysis. *National Tax Journal*, 52 (2): 157-78.
- Blustein, J., et al. 2011. Analysis Raises Questions On Whether Pay-For-Performance In Medicaid Can Efficiently Reduce Racial And Ethnic Disparities. *Health Affairs*, 30 (6): 1165–75.
- Bonnet, C. and Requillart, V. 2013. Tax incidence with strategic firms in the soft drink market. *Journal of Public Economics*, 106: 77–88.
- Bruce, D. and Mohsin, M. 2006. Tax Policy and Entrepreneurship: New Time Series Evidence. *Small Business Economics*, 26 (5): 409-25.
- Buettgens, M and Carroll, C. 2012. Timely analysis of immediate health policy issues, *The Urban Institute* (January).
- Carlson C. 2011. Estimated Premium Impacts of Annual Fee Assessed on Health Insurance Plans. Oliver Wyman Report. Oct 31, 2011.
- Carlson C. 2012. *Annual Tax on Insurers Allocated by State*. Oliver Wyman Report. Nov, 2012.
- Chernew, M., Cutler, D. M. and Keenan, P. S. 2005. Increasing Health Insurance Costs and the Decline in Insurance Coverage. *Health Services Research*, 40: 1021–39.
- Chernick, H.A., Holmer, M.R. and Weinberg, D.H. 1987. Tax policy toward health insurance and the demand for medical services. *Journal of Health Economics*, 6(1): 1-25.
- Clausing K.A. 2013. Who pays the corporate tax in a global economy? *National Tax Journal*, 66(1): 151-84.

- Cohen, M. 2007. An Overview of Medicaid Enrollees with Diabetes in 2003. *Kaiser Family Foundation: Medicaid and the Uninsured Issue Paper*
- DeCicca, P. and McLeod, L. 2008. Cigarette taxes and older adult smoking: Evidence from recent large tax increases. *Journal of Health Economics*, 27(4): 918-29.
- DeCicca, P. Kenkel, D. and Liu, F. 2013. Excise tax avoidance: The case of state cigarette taxes. *Journal of Health Economics*, 32 (6): 1130-41.
- Espinosa, J. and Evans, W.N. 2013. Excise Taxes, Tax Incidence, and the Flight to Quality: Evidence from Scanner Data. *Public Finance Review*, 41 (2): 147-76.
- Evans, W. Ringel, J. and Stech, D. 1999. Tobacco Taxes and Public Policy to Discourage Smoking, in *Tax Policy and the Economy*, volume 13, Ed. James Poterba, NBER Books, National Bureau of Economic Research, Inc, number pote99-2, September, pp.1-59.
- Feldstein, M.S. 1995. Tax Avoidance and the Deadweight Loss of the Income Tax. *NBER Working Papers* No 5055, Cambridge, MA: NBER.
- Fink, G., Robyn, P.J. and Sauerborn, R. 2013. Does health insurance improve health? Evidence from a randomized community-based insurance rollout in rural Burkino Faso. *Journal of Health Economics* 32: 1043-56.
- Finkelstein, E.A., Zhen, C., Bilger, M., Nonnemaker, J., Farooqui, A.M. and Todd, J.E. 2013. Implications of a sugar-sweetened beverage (SSB) tax when substitutions to non-beverage items are considered. *Journal of Health Economics*, 32(1): 219-39.
- Finkelstein, A., *et al.*, 2011. The Oregon Health Insurance Experiment: Evidence from the first year. *NBER Working Paper No 17190*. Cambridge, MA; NBER.
- Galewitz, P. 2013. States' Medicaid decisions cost community health centers. *Capsules*, October 16.
- Goolsbee, A. 1998. Taxes, organizational form, and the deadweight loss of the corporate income tax, *Journal of Public Economics*, 69 (1): 143-52.
- Gray, B. 2001. Do Medicaid physician fees for prenatal services alert birth outcomes? *Journal of Health Economics* 20: 571-90.
- Gurley-calvez, T. 2011. Will tax-based health insurance reforms help the self-employed stay in business? *Contemporary Economic Policy*, 29(3): 441-60.
- Judge, G.G., *et al.*, 1985. *The Theory and Practice of Econometrics*, 2<sup>nd</sup> edition. John Wiley & Sons (New York, NY).
- Kenkel. Are Alcohol Tax Hikes Fully Passed through to Prices? Evidence from Alaska, *The American Economic Review*, 95 (2): 273-77.

- Mankiw, N.G. 2008. Principles of Economics, 5<sup>th</sup> edition. South-Western Cengage Learning (Mason, OH).
- Marwood Group. 2011. Impact of ACA Annual Health Insurance Tax on State Medicaid Programs. Marwood Group Report. Oct, 2011.
- Meerschaert, J. D. and Doucet, M. 2012. PPACA Health Insurer Fee Estimated Impact on State Medicaid Programs and Medicaid Health Plans. Milliman Client Report. Jan 31, 2012.
- Miller, R. H. and Luft, H. S. 1997. Does managed care lead to better or worse quality of care? *Health Affairs* 16: 7-25.
- Oner, E. 2013. Simultaneous Effects of Supply and Demand Elasticity with Market Types on Tax Incidence (Graphical Analysis of Perfect Competition, Monopoly and Oligopoly Markets). *International Journal of Economics and Finance*. 5(2): 46-55.
- Poterba, J. M. 1996. Retail Price Reactions to Changes in State and Local Sales Taxes. *National Tax Journal*, 49 (2): 165-76.
- Santerre, R.E. and Neun, S.P. Health Economics: Theory, Insights, and Industry Studies, 6<sup>th</sup> edition. South-Western CENGAGE Learning (Mason, OH)
- Selden, T.M. and Bernard, D.M. 2004. Tax Incidence and Net Benefits in the Market for Employment-Related Health Insurance: Sensitivity of Estimates to the Incidence of Employer Costs. *International Journal of Health Care Finance and Economics*, 4 (2): 167-92.
- Shen, Y.-C. and Zuckerman, S. 2005. The effect of Medicaid payment generosity on access and use among beneficiaries. *Health Services Research*, 40: 723-44.
- Stillman, M. and Taylor, M. 2013. Dead man walking. *New England Journal of Medicine*, 369 (November 14): 1880-81.
- Van de Water, P.V. 2013. Health Reform Tax on Insurers Should Not Be Repealed. Center on Budget and Policy Priorities report. July 25, 2013.
- United Health. 2010. The United States of Diabetes: Challenges and opportunities in the decade ahead. Center for Health Reform and Modernization. November, 2010. *Working paper*
- Viauroux, C. 2013. Tax Sharing in Insurance Markets: A Useful Parameterization. *The Journal of Risk and Insurance*. DOI: 10.1111/j.1539-6975.2013.01528.x.
- Wagenaar, A. C., Salois, M. J. and Komro, K. A. 2009, Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction*, 104: 179–90.

White, J.S. and Ross, H. 2013. Smokers' strategic responses to sin taxes: Evidence from panel data in Thailand? *Health Economics*. doi:10.1002/hec.3004

## DATA SOURCES APPENDIX

Diabetes Prevalence Rate – CDC, Diabetes Public Health Resource (2003 – 10)

[http://www.cdc.gov/diabetes/atlas/interactive\\_atlas.htm](http://www.cdc.gov/diabetes/atlas/interactive_atlas.htm)

Medicaid Enrollment Rate – CMS, Medicaid Statistical Information System (MSIS) State Summary Datamarts (2002 – 09; study uses one-year lag) <http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MSIS-Mart-Home.html>

<http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MSIS-Mart-Home.html>

Medicaid Spending per enrollee – CMS, Medicaid Statistical Information System (MSIS) State Summary Datamarts (2002 – 09; study uses one-year lag): calculated by dividing total spending by number of enrollees for each state for each year.

<http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MSIS-Mart-Home.html>

Real GDP per capita – BEA, (2002-09; study uses one-year lag)

[http://www.bea.gov/newsreleases/regional/gdp\\_state/gsp\\_newsrelease.htm](http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm)

% Uninsured – US Census (2003-10) American Community Survey

<http://www.census.gov/hhes/www/hlthins/data/index.html>

%  $\geq 65$  years - US Census (2003-10) American Community Survey

<http://www.census.gov/hhes/www/hlthins/data/index.html>

HMO Penetration Rate – Kaiser State Health Facts (special data request) (2003-10)

<http://kff.org/other/state-indicator/hmo-penetration-rate/>

Bad Health Indicator - CDC, Diabetes Public Health Resource (2002 – 09) study uses lag terms of Obesity and smoking rates. Behavioral Risk Factor Surveillance System

<http://apps.nccd.cdc.gov/brfss/>

Physician Office Employees – BLS (2003-10) National Industry-Specific Occupational Employment and Wage Estimates [http://www.bls.gov/oes/current/naics4\\_621100.htm](http://www.bls.gov/oes/current/naics4_621100.htm)

## APPENDIX

Table III: Summary of Empirical Literature on the Impact of Taxation

Study	Research Question	Model & Methods	Data	Conclusion
Nivolas & Vera Hernandez 2008	estimate how the insurance premium affects the probability of having private insurance, and, subsequently, how having private insurance affects health care use and the costs borne by the public sector	discrete choice model	1994 edition of a representative survey of the non-institutionalized population of individuals in Catalunya, Spain.	the elimination of the subsidies to private policies did not generate a statistically significant increase in costs for the public sector.
Chernick et al. (1987)	whether tax subsidy to employer-provided health insurance has led to overinsurance, excess demand for medical care, and to rapid expenditure growth in the medical care sector	static microsimulation model	existing estimates of the elasticities of demand for health insurance and medical services	complete elimination of the favorable tax treatment of employer contributions to health insurance would reduce the demand for employer-sponsored health insurance by 16–27 percent and the overall demand for medical services by about 4–6 percent.
Selden & Bernard (2004)	understand the distribution of burdens and benefits from employment-related coverage across worker characteristics	simple regressions and tax stimulation	1996 Medical Expenditure Panel Survey (MEPS) data	conventional estimates of tax subsidy regressivity are highly robust to alternative incidence assumptions
<b>Sin tax</b>				
Evans et al (1999)	analyze the likely impact of cigarette tax hikes on	fixed effects model	both state and individual data from	estimated a cigarette demand elasticity to be 0.30 to 0.50, with long-term elasticities 1.75 times the short-term values

	consumers, governments, and producers		1985-1996	
White & Ross (2013)	consider the extent to which a tax increase on cigarettes in Thailand induced smokers to change their consumption behavior in three ways.	models with community-specific random intercepts and with individual fixed effects	data on first two waves of the International Tobacco Control Southeast Asia Survey	Thailand's tax increase appears to have led some smokers to quit smoking, but it did not alter the smoking intensity of continuing smokers. smokers are significantly more likely to purchase cigarettes by the stick, or lower-priced brand, or cheaper substitutes as the market price for cigarettes increases.
Espinosa & Evans (2013)	exam whether higher excise tax rates on cigarettes induce a shift to higher quality cigarettes	longitudinal model with both state- and time-fixed effects	weekly price and quantity data from supermarket scanners of all cigarettes sales in 812 stores from 43 markets covering 29 states over the 2001–2006 period	retail prices of cigarettes are raised penny for penny with state tax hikes. tax changes induce little between-brand substitution but substantial within brand differences in purchase behavior.
Bonnet & Requillart (2013)	alternative tax policies on soft drink consumption	Demand: random coefficient logit model; Supply: model based on profit maximization.	2005 data from a French representative consumer panel data of 19,000 households	An excise tax is overshifted to consumer prices while an ad valorem tax is under-shifted to consumer prices. Ignoring strategic pricing by firms leads to erroneous estimates of the impact of taxation by between 15% and 40% depending on the products and the tax implemented. In the short-term, that is, ignoring positive long-term health effects, a €9 cents/l excise tax has a small negative welfare effect (about €1/person/year).
DeCicca & McLeod (2008)	investigate price-responsiveness of older adult smoking using variation from recent historically large cigarette tax increases in the U.S.	two-way fixed effects model	Behavioral Risk Factor Surveillance System from 2000 to 2005	higher taxes reduced smoking participation by older adults, especially those who are less educated and live in low-income households
DeCicca et al. (2013)	analysis of cigarette tax avoidance	Endogenous switching regression model	individual-level data on cross-border cigarette purchases: 2003 and 2006–2007 cycles of the Tobacco Use Supplements to	tax avoidance strongly responds to the price differential. for many states, after taking into account tax avoidance the optimal tax is at least 20% smaller than the standard Pigouvian tax that simply internalizes external costs

			the U.S. Current Population Survey (TUS-CPS)	
Finkelstein et al (2013)	Implications of a sugar-sweetened beverage (SSB) tax	exogenous and IV-two part models	2006 Homescan panel	the tax would result in a decrease in store-bought energy of 24.3 kcal per day per person
Wagenaar (2009)	Effects of beverage alcohol price and tax levels on drinking	meta-analysis	112 studies containing 1003 estimates of tax/price-consumption relationship	beverage alcohol prices and taxes are related inversely to drinking
<b>tax incidence</b>				
Kenkel (2005)	impact of alcohol tax hikes on prices	linear regression model	phone surveys of alcoholic beverage prices in Alaska in 2002.	alcohol taxes are more than fully passed through to beverage prices
Poterba (1996)	test the hypothesis that state and local retail sales taxes were fully shifted to consumers	linear regression model	city-specific clothing price indices for eight cities during the 1947–77 period and fourteen cities during the 1925–39 period	retail prices rise by approximately the amount of the sales tax in postwar period and clothing prices appear to rise by only two-thirds of the amount of sales taxes in the Depression period
Besley & Rosen (1999)	exam the incidence of sales taxes	semi logarithmic model	price, tax and cost data of 12 commodities in 155 cities from 1982-1990	fully pass-through for some commodities and over-shifting for some other commodities
Clausing (2013)	examine the incidence of corporate tax in a global economy	vector autoregression model of a system of equations	wage and tax policy data for OECD countries 1981-2009 from various sources	no robust link between corporate taxation and wages
<b>Deadweight loss</b>				
Feldstein (1995)	estimate deadweight loss of income tax	microsimulation model based on a stratified random sample	100,000 individual tax return data for 1991	A marginal increase in tax revenue achieved by a proportional rise in all personal income tax rates involves a deadweight loss of nearly two dollars per incremental dollar of revenue.
Goalsbee (1998)	estimate the impact of	linear model	data on capital by	the effect of taxes is significant but small

	taxes on organizational form using data		organizational form from BEA in 1900–1939	
<b>tax and labor market (self-employment)</b>				
Gurley-Calvez (2011)	investigate whether the 25% self-employment health insurance deduction implemented under TRA86 had an effect on the probability of exit self-employment	IV Probit model	a panel of tax return data of 1988-1990 from University of Michigan Tax Research Database	households claiming the deduction are indeed less likely to exit self-employment
Bruce & Mohsin (2006)	examine the impact of tax policies on self-employment rates	time series regression model	tax return data from the Internal Revenue Service (IRS) and Current Population Survey data from the Bureau of Labor Statistics (BLS) 1950-1999	most of these taxes have significant but small effects on self-employment activity