

**Effects of Medicaid Expansions on Health Insurance Coverage:
The Case of the Oregon Health Plan**

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Executive Summary:

We examine how Medicaid expansions affect the take-up rate of public health insurance and the subsequent drop-off from private health insurance plans. The ratio between private insurance drop-off and public take-up tells us the rate of crowd-out. Over the 1990-2003 period, we determine estimates for several subsets of the population: children, pregnant women, and adults. Our statistical analysis finds that people of all population subsets switch over from private to public insurance, and that crowd-out among children is the smallest of the three subsets. Take-up for children is 40.5% and the private insurance drop-off due to Medicaid eligibility is 3.1%, and both of these values are consistent with previous national studies. For pregnant females, we receive estimates of take-up and crowd-out that are considerably higher than other literature suggests. For this group, we find a take-up rate of 28% and a private insurance drop-off rate of 36.9%. Our results for all other adults show a similar trend of a crowd-out rate higher than 100%. Take-up for adults is 31.8% and we find the private insurance drop-off rate to be 32.7%.

In this paper, we also look at the effects of the structural changes in the Oregon Health Plan in 2003 on take-up and crowd-out rates for all three groups. For children we find that the 2003 OHP event has a statistically significant effect only on the private insurance drop-off rate. According to our findings, children who are eligible for public insurance are more likely to drop their private insurance plan as a result of the redesign of benefits in 2003. For pregnant females, take-up decreases and crowd-out increases, and

for other adults, the take-up rate also decreases, but we find no significant effect on the private insurance drop-off rate.

We also extended our study to look at how Medicaid expansions affect different income groups, and how increases in public health insurance eligibility specifically affect individuals in Oregon. We find that people below 50% of the federal poverty line have different percentages of take-up and crowd-out from the population as a whole, though our estimates show that lower income children and pregnant women are more likely to be covered, whereas other adults within this income bracket are less likely to be covered under a public plan.

Lastly, we find that children in Oregon are more likely than children in Washington and California to drop their private insurance plans as a result of being eligible for Medicaid. For pregnant women in Oregon, we find less public insurance take-up, and less private insurance drop-off. Thus, there is evidence that there are some factors unique to Oregon that affect health insurance coverage.

Approved: _____

Prof. Bruce Blonigen

Date

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I. Introduction

The question of public health insurance is an issue of national and even global debate due to its direct importance to people, as well as because of the governmental funding that it requires. Public health issues occupied the central stage in the recent U.S. Presidential elections and ongoing political debates. Ideas range from further expanding the public health insurance to the point of universal health care, or shrinking the program to decrease the strain on the national budget and taxpayers. Universal health care is most appealing to the people who cannot afford private insurance, while reduction in public health care gains approval among those unwilling to support large public programs by the taxes they pay. An alternative is to shift the cost of the health insurance to the private sector and, since approximately 80% of the private insurance is provided by employers, the cost would be borne by businesses.

Recent history in the U.S has seen large increases in publicly-funded health insurance and health care. One example is the Medicaid program, which was established in 1965 as a joint state-federal program financed by state contributions and federal matching funds. Initially, program participants were low-income, aged, or disabled, families with dependent children. Later coverage was expanded to pregnant women who were relatively low-income. A series of federal laws in the 1980s broke the link between Medicaid and the welfare recipient, raising the family income limit for coverage and extending eligibility to children in two-parent families. Because of these expansions, the Medicaid that already accounts for a large percentage of GDP is still increasing in cost. In 2003, the federal government spent about \$266 billion on Medicaid (approximately 2% of

GDP), and the Congressional Budget Office estimates Medicaid expenditures will continue to increase at a rate of 8 or 9% over the next few years.

While this was happening on the federal level over the past decades, the state of Oregon provided even further expansions in the public health insurance coverage under the program called the Oregon Health Plan (OHP). OHP is a blueprint for universal access to basic and affordable health coverage, achieved through lowering the costs by emphasizing managed care, preventive care, early intervention, primary care, and not covering ineffective care. This was meant to be achieved through innovations such as implementing the Prioritized List for medical services which was first implemented in 1994. The Prioritized List is the benefit package ranking more than 700 diagnoses and treatments in order of importance. The State Legislature then drew a line at item 587. Treatment below the line would not be covered. At the same time, OHP expanded Medicaid to make it available to most people living in poverty regardless of age, disability or family status. In addition to 250,000 Oregonians already covered under Medicaid, 100,000 persons have become newly eligible under OHP.

The purpose of our research study is to examine the extent to which different populations enroll in (or take-up) public insurance programs when they become eligible and whether this leads to any crowding out of existing private insurance coverage. Our primary contributions to the existing literature on this subject are as follows. We determine whether the rates of take-up of public health insurance and drop-off of private health insurance are different in Oregon than in other states included our study. We also cover the years 1990-2004, whereas previous studies all stop in the mid-1990s when a number of important changes were occurring to the Oregon Health Plan. As previously

mentioned, we will add in an analysis of adult populations, a population subset that has thus far been omitted from previous literature. Our study estimates how the restructuring of OHP in 2003 affected take-up and crowd-out rates. Finally, we provide some analysis of how take-up and crowd-out rates differ among different income groups.

Our initial analysis finds that people of all population subsets switch over from private to public insurance, and that crowd-out among children is the smallest of the three subsets. Take-up for children, for example, is 40.5% and the private insurance drop-off due to Medicaid eligibility is 3.1%, and both of these values are consistent with previous national studies. For pregnant females, we receive estimates of take-up and crowd-out that are considerably higher than other literature suggests. For this group, we find a take-up rate of 28% and a private insurance drop-off rate of 36.9%. Our results for all other adults show a similar trend of a crowd-out rate higher than 100%. Take-up for adults is 31.9% and we find the private insurance drop-off rate to be 32.7%. We find evidence that the 2003 changes in the Oregon Health Plan had a statistically significant effect on all population subsets to at least some extent, that people in Oregon are affected differently by Medicaid expansions than people in California and Washington, and that people of the lowest income group have different take-up and crowd-out rates than the general population.

II. Literature Review

There have been many studies looking at the issue of private coverage crowd-out. Perhaps the most well-recognized among them is a paper by Cutler and Gruber (1995), “*Does Public Insurance Crowd-Out Private Insurance?*” This work addresses several

issues related to the topic of health insurance; namely, whether increasing public insurance eligibility causes a decrease in private health insurance coverage. Cutler and Gruber provide a framework for analyzing this issue. Their basic regression equation is as follows:

$$\text{COVG}_i = B_0 + B_1\text{ELIG}_i + X_i B_2 + B_3\text{STATE}_i + B_4\text{YEAR}_i + B_5\text{AGE}_i + e_i$$

Here, the dependent variable, COVG, can be either private insurance coverage or public coverage. If COVG stands for public coverage, the parameter, B_1 , represents the take-up rate. In other words, it provides an estimate of the probability that a person enrolls in public health insurance if that person is eligible, all other factors equal. If private coverage is the dependent variable, B_1 measures the rate of private insurance drop-off associated with being eligible for Medicaid. In other words, if an individual is eligible, B_1 tells us the subsequent likelihood of being covered by private insurance. Crowd-out occurs when an individual drops private insurance and takes up a public insurance plan, and can be calculated by examining the ratio between public insurance take-up and private insurance drop-off. Cutler and Gruber also refer to crowd-out as the “substitution hypothesis,” since individuals substitute one plan for another.

Using this general regression model, Cutler and Gruber came up with estimates of take-up and crowd-out rates for the U.S. population during the period from 1987-1992. They estimated that between 49 and 77% of the increase in Medicaid coverage was associated with a decline in private insurance coverage. The rest of the private coverage decline remains unexplained, though Cutler and Gruber suggest macroeconomic factors, changes in the demographic characteristics of the population, or changes in employer behavior as possible reasons for the drop in private insurance coverage.

Cutler and Gruber's work, while undeniably influential on the topic of health insurance crowd-out, is not immune from criticism. In particular, an article by Shore-Sheppard (2005), "*Stemming the Tide? The Effect of Expanding Medicaid Eligibility on Health Insurance*," suggests that Cutler and Gruber's estimates are skewed by omitted variable biases. Specifically, she claims their omission of state by year effects, age by year effects, and age by state effects cause their take-up and crowd-out rates to be misleadingly high. Though Shore-Sheppard's work focuses only on crowd-out/take-up rates among children, her results are significantly different from Cutler and Gruber's estimates for children. The take-up rate falls from 24% under Cutler and Gruber's model to 4-5% when the aforementioned variables are included. The private insurance drop-off rate falls from 7.4% (remember, this is the rate determined by Cutler and Gruber for children only) to 0% under the revised model. Thus, Shore-Sheppard contends that none of the private coverage losses were due to Medicaid expansions.

As Shore-Sheppard explains in her article, including the aforementioned interaction variables causes any evidence of crowding out to disappear. One must question, however, whether the inclusion of interaction variables in her model may have caused over-specification, ultimately driving crowd-out estimates to zero. If the model includes too many explanatory variables, there will be little remaining variation from which to identify the eligibility changes on state and private insurance enrollments. Shore-Sheppard also presents estimates for the years 1987-1995 as opposed to Cutler and Gruber's estimates for the years 1987-1992. Using different years could affect Shore-Sheppard's results, especially since many states expanded Medicaid programs during the period from 1993-

1995 (Oregon included). Thus the results of these two studies cannot be compared without some acknowledgment of this variation.

In all the research on the topic of private coverage crowd-out, one would be hard-pressed to find a consensus among any two researchers about the extent of crowd-out. Different assumptions, methodologies, interpretations, and data sources all contribute to the wide variety of results, and despite all the research done on this subject, there is no bottom-line consensus on the extent to which crowd-out occurs. In our own research, we must take this into consideration, drawing influence from Cutler and Gruber, Shore-Sheppard, and others, but remaining aware that the methodologies in this field are still widely contested.

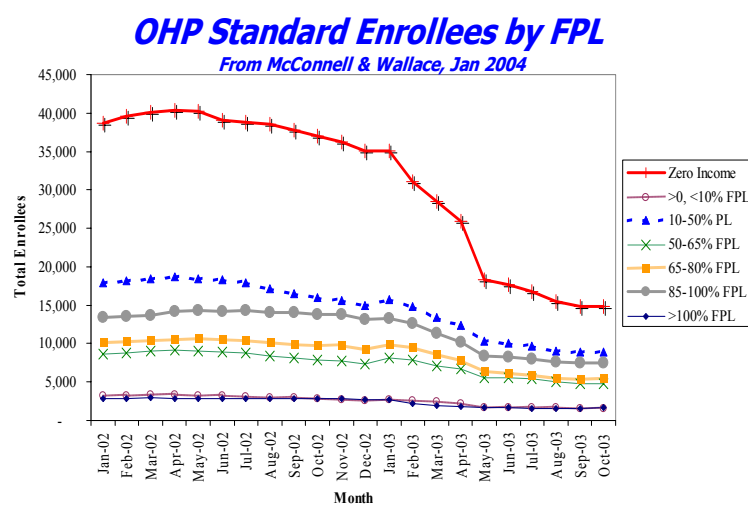
Even though our own research will narrow observations from previous studies to include just the West Coast, crowd-out and take-up estimates from Cutler and Gruber and Shore-Sheppard will provide us with a benchmark for our own results. Though our estimates will undoubtedly be different from the national estimates, we should at least see an approximate resemblance to previous results.

III. Hypotheses

In this project, the central question we address is how Medicaid expansions affect take-up and crowd-out rates for children, pregnant women, and low-income adults on the West Coast. Using the estimated rates of public insurance take-up and private insurance drop-off, we can determine how much of the drop-off of private insurance is due to individuals joining a Medicaid program—or in other words, the crowd-out rate. By running our regressions for different subsets of the population, we can compare how take-

up and crowd-out differ between these groups. Because we are using previous studies as models for our own project, we hypothesize that we will obtain at least somewhat similar results as received in preexisting literature. The fact that our study will cover the years 1990-2004, whereas previous studies stop in the mid-1990s, however, will undoubtedly provide some variation. Also, the fact that our project is focusing on just the West Coast, whereas Cutler and Gruber and Shore-Sheppard analyzed the issue of take-up and crowd-out on a national level will likely account for some differences in results.

Our paper makes a contribution to the existing literature on this subject in the ways mentioned above, but also because it addresses the effects of Medicaid expansions on adult populations. In the late 1980s and early 1990s, only a few states offered some kind of public health insurance for childless adults. The earlier studies from the early 1990s therefore could not analyze adult take-up on a national level. We suspect, however, that adults will provide the most interesting study of crowd-out. The following graph shows the drop-off from the Oregon Health Plan among the adult population only:



OHP program changes in 2003 caused a large number of people to lose their public health insurance plan, but of those people, adults comprised the largest percentage. Between February 2003 (the month during which most restructuring plans were implemented) and the beginning of 2004, 45% of adults on OHP lost their coverage, as opposed to 12% of pregnant females and children. Because of the increased cost-sharing structures and the implementation of a lock-out period for individuals who do not make a payment on time, we should find lower take-up rates in Oregon after 2002. Lower take-up rates, however, should be most pronounced among adults, since the changes in 2003 affected them the most.

Another extension of our project aims to look at Oregon-specific effects. By including a variable that interacts eligibility with being from Oregon, we can determine how the take-up rates and crowd-out rates differ in Oregon vis-à-vis the other states in our sample (Washington and California). At this point we have no basis for speculation about how being from Oregon affects public insurance take-up and private insurance drop-off.

Lastly, we will look at how being eligible for Medicaid affects take-up and crowd-out rates for different income groups. Specifically, we will test whether there is any difference in our estimates for those who are eligible and under 50% of the federal poverty line. While the state has a responsibility to secure social welfare to the poorest of the poor, these people often get overlooked for state welfare programs like Medicaid because they do not have a stable address or phone number, or are simply unaware of the type of assistance they are eligible for. Based on this reasoning, we might hypothesize that for adults at least, public insurance take-up will be lower for the lowest income group. However, income under 50% of FPL may include both people who have no address and no

job, as well as people who have a job but do not make enough money to get by. There is probably a large number of people in this group that fully takes advantage of these types of assistance programs. Through our regressions, we will explore these hypotheses and questions.

IV. Methodology

We draw our regression model from the work of Cutler and Gruber (1995). We will adopt a form of their regression equation, expand the study to include data from 1990-2004, and focus the model on the effects specifically in Oregon. Our model acknowledges that private insurance coverage is a function of eligibility for public insurance, demographic variables, the particular state, and the particular year. If we choose to focus this paper on children, we will want to include an age variable, since children of different ages are affected differently by increases in eligibility. The actual equation, as mentioned in the section on Cutler and Gruber's paper will be as follows (variable descriptions in Appendix A):

$$\text{covg}_i = B_0 + B_1 \text{elig}_i + B_2 \text{hhwork}_i + B_3 \text{age}_i + B_4 \text{white}_i + B_5 \text{numper}_i + B_6 \text{marcouple}_i + B_7 \text{malehh}_i + B_8 \text{faminc}_i + B_9 \text{emp}_i + u_i$$

In this equation, just as was discussed in the literature review section, the variable B_1 is interpreted differently depending on whether we have public insurance or private insurance as our dependent variable. If public insurance is the dependent variable, B_1 measures the take-up rate, or in other words, how being eligible affects the likelihood of having a public insurance plan. With private insurance as the dependent variable, B_1 measures the crowd-out rate, or rather, how much of the drop-off from private insurance is associated with

being eligible for a Medicaid program. The major difficulty in measuring crowd-out is figuring out how to differentiate between the effects of the “substitution hypothesis” and other factors contributing to decreases in private insurance coverage. Cutler and Gruber were able to look at national data, with different states implementing different eligibility requirements. Thus, states that increased eligibility for Medicaid by a large percentage should have seen a greater drop in private insurance than states that capped eligibility at a lower level. Any macroeconomic factors affecting the nation as a whole, therefore, should not have had much effect on the results.

If we were to look only at Oregon, it would not be possible to differentiate between the crowd-out effect and any macroeconomic factors affecting the nation. A private insurance drop could be a result of either increases in eligibility for Medicaid, or a result of a recession. Thus, it is important in our model to include at least one control group. We include observations for the state of Washington and California as control observations in our model. This will allow us to accurately assess whether any drops in private insurance coverage are due to changes in the eligibility requirements of the Oregon Health Plan.

V. Data

In this project we will use the data from the Current Population Survey, which was also used in previous studies. The CPS is a monthly survey of households conducted by the Bureau of Census for the Bureau of Labor Statistics. It provides a comprehensive body of data on the labor force, employment, unemployment, and persons not in the labor force. We select the data for Oregon, and use the states of Washington and California as control groups for our findings.

Table 1: Descriptive Statistics of Variables

Variables:	Mean	Standard Deviation	Min	Max
Stateins	0.143	0.35	0	1
Othins	0.469	0.5	0	1
Hhwork	1.604	1.366	0	20
Age	32.34	21.343	0	90
White	0.843	0.364	0	1
Numper	3.847	1.928	1	18
Marcouple	0.666	0.472	0	1
Malehh	0.117	0.321	0	1
Faminc	49966.17	51883.29	-19998	879326
Emp	0.407	0.491	0	1

Note: See Appendix A for descriptions of the variables listed in this table

Before we can begin our regression analyses, we first created eligibility variables. Because different groups of the population have different Medicaid eligibility guidelines, we had to code each group separately. To calculate these variables we first found at what level of the federal poverty line particular groups of the population were eligible (for a table of these eligibility guidelines, see Appendix B). Eligibility requirements vary across states and time, and when states expand Medicaid, eligibility goes up to include people at a higher level of the federal poverty line. Adjusting the poverty level for the number of the people in the household, we were then able to create an eligibility dummy variable that equals 1 if the individual is eligible for public health insurance (Medicaid or another state-sponsored insurance program) and 0 otherwise.

The eligibility variable for pregnant women, however, was not as straightforward to code up. Since the Current Population Survey does not ask whether a woman is pregnant, we had to be more creative in how this variable got coded. Initially, we ascribed a percentage to all women between the ages of 19 and 44 that represented the likelihood that

that woman would be pregnant in a given year. After seeing that our results using this eligibility coding were completely unsound, we opted to recode this variable based on different criteria. Instead, we inferred pregnancy in the previous year for women who had an infant (child less than 1 year old) in the household, and thus assigned eligibility for public health insurance accordingly.

Upon an initial inspection of our data, we found that there were a number of individuals who were coded as having health insurance under a public plan, but who we coded as not being eligible. These people could be blind or disabled or could have been mislabeled. In either case, we chose to omit these observations from our sample so as to prevent these outliers in the data from skewing our results.

VI. Regression Analysis

A. Children

We begin our analysis by determining the take up rate and the crowd out rate for children. At first we regress the public insurance variable on the child eligibility for a state-sponsored insurance and a set of demographics variables including the number of household members employed, age, sex, race, number of people in the household, whether individuals in the household are married, and whether the head of the household is male or female. Column 1 of Table 2 provides ordinary least squares (OLS) regression estimate of our basic model. We find that if an individual below the age of 19 is eligible for public insurance then the likelihood of the child to be covered under the state-sponsored insurance is 40.5%*(throughout the paper the “*” symbol will indicate that the value is statistically

significant on the 95% level). This value represents the take-up rate, and is consistent with our expectations and previous findings. For example, Cutler and Gruber found a take-up rate of 23.5% for public health insurance for children.

To find a crowd-out rate, we regress a dependent variable of “otherins” (whether an individual is covered under employer-sponsored or other kind of private insurance,) on the same set of independent variable as in the regression above. These results are shown in column 4 of Table 2. We find that a child (below age 19) being eligible for state-sponsored insurance results, on average, in a 3.1%* reduction in private insurance coverage. This value, while somewhat smaller than Cutler and Gruber’s private insurance drop-off estimate of 7.4%, remains fairly consistent enough with their findings.

Table 2: Estimates of Crowd-out and Take-up for Children

Variables:	State Insurance			Public Insurance		
	Regression w/ State & Year Dummies [R ² =.51]	Regression with copay event [R ² =.51]	Basic with OR-specific effects [R ² =.51]	Regression w/ State & Year Dummies [R ² =.36]	Regression with copay event [R ² =.36]	Basic with OR-specific effects [R ² =.36]
child eligibility	0.405** [135.92]	.404** [135.19]	.405** [132.53]	-.031** [-12.23]	-.030** [-11.88]	-.029** [-11.21]
# workers in house	-0.037** [-37.24]	-.037** [-37.24]	-.037** [-37.21]	0.020** [24.35]	0.020** [24.35]	.020** [24.40]
age	-0.004** [-17.21]	-.004** [-17.20]	-.004** [-17.22]	0.028** [160.34]	0.028** [160.32]	.027** [160.29]
sex	-0.005** [-2.35]	-0.005** [-2.34]	-0.005** [-2.35]	-0.002 [-1.27]	-0.002 [-1.28]	-0.002 [-1.28]
white	-.028** [-9.16]	-.028** [-9.15]	-.028** [-9.17]	0.0003 [.10]	0.0003 [.08]	0.0001 [.04]
# ppl in household	.012** [16.89]	.012** [16.89]	.012** [16.86]	-.015** [-25.82]	-.015** [-25.82]	-.015** [-25.89]
married couple	-.132** [-44.86]	-.132** [-44.85]	-.132** [-44.87]	.011** [4.45]	.011** [4.42]	.011** [4.32]
male head of house	-.166** [-32.33]	-.166** [-32.33]	-.166** [-32.35]	0.002 [.49]	0.002 [.49]	0.002 [.44]

ohp event	0.015 [1.18]	-0.032** [-3.11]
Oregon effect	-0.009 [-1.08]	-0.020** [-3.04]

Notes: “**” denotes statistical confidence of 99% that the coefficient is different from zero. The t-statistics are in brackets.

When comparing the output for these two regressions in columns 1 and 4, we see that the coefficients for our demographic variables acquire opposite signs, for example the coefficient for the married couple variable is negative when regressed on the state insurance dependent variable, but it changes to a positive coefficient when regressed on the private insurance variable. The opposite happens with coefficient on the male head of the household variable. These results are consistent with the expectations that the households with married couples and males as heads of a family are covered more under the private insurance relative to public insurance.

In our basic regression we include state and year dummy variables to our child regression equations. Whether or not an individual has private, public, or no health insurance may depend on what state they live in. In addition, various macroeconomic factors may affect enrollment in public and private health insurance. These effects will be captured by year dummy variables.

Many of our year dummy variables are statistically insignificant, so we ran a test to determine the likelihood that all of our year variables are jointly equal to zero. If they are simultaneously equal to zero, then we can accept the hypothesis that they have no explanatory power in our model. Upon doing this test, however, we learn that the F-stat for our variables [F=2.42] is greater than the F-critical value, which means we reject our null hypothesis that the year variables have no explanatory power. Therefore, we keep both state and year dummy variables in our regression models.

Next, we examine the effects of recent changes in OHP on crowd-out and take-up rates. In 2003, nearly half of OHP participants dropped the program as a result of increased co-pays, higher premiums, and stricter enrollment requirements. Our expectation for the years following 2002, therefore, was that there would be lower rates of take-up of public insurance, and potentially a subsequent shift towards private health insurance. To examine the effects of these program changes, we include a variable in our regression that takes the value of 1 for eligible children in Oregon after 2002 and 0 otherwise. Columns 2 and 5 of Table 2 provide results from this specification. Our regression output indicates that the OHP take-up rate for children remained unchanged after 2002. The variable measuring the effect of the 2003 program changes was statistically insignificant, thus making it impossible to say with any certainty that take-up rates for children were affected by the 2003 changes. One possible explanation for this almost non-existent effect is that the number of program changes in the Oregon Health Plan in recent years neutralized each other. While the implementation of OHP2 in 2003 meant higher co-pays and premiums (though for children, to a lesser extent), in 2004 OHP eligibility for children rose from 170% of the Federal Poverty Line to 185% as a result of additional SCHIP funding.

Changes to OHP in 2003 did, however, affect the rate of crowd-out. The interaction variable measuring the effect of the 2003 event on children in Oregon is statistically significant and negative, meaning that the probability of being covered under a private insurance plan went down in the years following 2002. The fact that more people were not taking up public insurance, but there was a drop in private insurance coverage

tells us that the rate of uninsurance among children increased during this time, a result which could have serious implications for policymakers.

Since we want to focus our research on Oregon, we then add in an interaction variable that captures Oregon-specific effects. For the equation with state insurance as our dependent variable, the coefficient for our Oregon-specific variable has a magnitude of -.009, but this value is not statistically significant. We, therefore, cannot say with any confidence that public insurance take-up rates for children in Oregon differ from those in Washington or California. For our equation with private insurance coverage as our dependent variable, the coefficient for our Oregon-specific variable is -.02* and is statistically significant at the 99% level. This tells us that a child eligible for a state Medicaid program in Oregon is less likely to drop private health insurance as a result of being eligible than a child in Washington or California.

B. Pregnant Females

Table 3: Take-up and Crowd-out Estimates for Pregnant Females

Variables:	Regression w/ State & Year Dummies [R ² =.44]	Regression with copay event [R ² =.44]	Basic w/ OR-specific effects [R ² =.44]	Regression w/ State & Year Dummies [R ² =.73]	Regression with copay event [R ² =.73]	Basic w/ OR-specific effects [R ² =.73]
pr_female eligibility	0.28** [18.20]	0.285** [18.38]	0.28** [17.88]	-.369** [-20.81]	-.372** [-20.83]	-.382** [-20.98]
# workers in house	-0.026** [-4.64]	-0.026** [-4.69]	-0.026** [-4.64]	0.011* [1.78]	0.012* [1.81]	0.012* [1.81]
age	-0.003** [3.11]	-0.003** [-3.11]	-0.003** [3.11]	0.007** [6.17]	0.007** [6.18]	0.007** [6.19]
white	-0.028 [-1.81]	-0.028 [-1.79]	-0.028 [-1.81]	-.032* [-1.79]	-.032* [-1.80]	-.032* [-1.79]
# ppl in household	0.001 [.30]	0.001 [.26]	0.001 [.29]	-.034** [-8.56]	-.034** [-8.53]	-.034** [-8.50]
married couple	-.230** [-15.70]	-.229** [-15.63]	-.229** [-15.66]	.161** [9.56]	.160** [9.51]	.159** [9.44]

male head of house	-.214** [-2.69]	-.212** [-2.67]	-.213** [-2.68]	-0.025 [-.28]	-0.027 [-.29]	-0.028 [-.30]
family income	-3.87e-08 [-.29]	-2.86e-08 [-.21]	-3.32e-08 [-.25]	8.06e-07** [5.18]	8.00e-07** [5.14]	7.72e-07** [4.95]
employed	-.067** [-4.97]	-.067** [-4.96]	-.066** [-4.95]	.103** [6.67]	.103** [6.66]	.102** [6.57]
ohp_event		-.21** [-2.43]			0.142 [1.42]	
Oregon effect			-0.031 [-.56]			.191** [3.03]

Notes: “**” denotes statistical confidence of 99% that the coefficient is different from zero. The t-statistics are in brackets.

The public health insurance take-up rate estimates for pregnant women tell us that if a pregnant woman is eligible for Medicaid, then the likelihood of her actually being on public health insurance is 28%*. This value differs considerably from Cutler and Gruber’s study, which found that approximately .8% of eligible women took up public insurance. The fact that Cutler and Gruber used years 1987-92 whereas our study looked at 1990-2004 could partially account for this variation. In addition, Cutler and Gruber do not explain how they determine whether a female is pregnant. If our methodologies differ in this respect, this could also account for the extreme variation between their estimates and ours.

When we run the same regression with private insurance as our dependent variable, we see that being eligible for public health insurance means that private insurance take-up goes down by 36.9%*. This value also differs greatly from Cutler and Gruber, who found that being eligible results in a 4.5% drop-off from private insurance. If changes in eligibility lead to a 28% increase in public insurance and a simultaneous 36.9% decrease in private health insurance, this represents a rate of crowd-out of more than 100%. In other words, as eligibility for the Medicaid program increases, all the women who enroll in the public insurance program had previously been covered under private insurance. Thus, the

Medicaid expansion would not be providing health insurance to pregnant women who were previously uninsured, but rather to people who already had coverage under a private or employer-sponsored plan. It is not clear, however, whether individuals switch over to the public plan because they can receive insurance at lower costs, or because employers stopped offering an insurance plan. The fact that being eligible results in more people dropping private insurance than picking up public insurance is somewhat of a mystery. This result tells us that there is some error in our regression equation, either in the data or the functional form.

To see whether the OHP program changes in 2003 affected pregnant females, we ran our regressions again, but with an OHP event variable, which simply accounts for any difference in the crowd-out and take-up rates in Oregon after 2002. With state insurance as our dependent variable, we receive a negative and statistically significant coefficient on our OHP event interaction variable. This tells us that after 2002, pregnant women in Oregon were less likely to take-up a public health insurance plan. This result is consistent with our expectations, since the implementation of co-pays and premiums in 2003 caused fewer people to take up the Oregon Health Plan. With private insurance as our dependent variable, the coefficient for the OHP event variable is positive, but not statistically significant.

As we did for children, we want to determine whether the take-up and crowd-out rates for pregnant women in Oregon are different than those in Washington and California. We find a statistically insignificant magnitude of $-.03$ for our Oregon-specific interaction variable when state insurance is our dependent variable. We, therefore, cannot be confident that public health insurance expansions affect pregnant women in Oregon any

differently than expansions affect pregnant females in Washington and California. With private insurance as our dependent variable, however, we do receive an estimate that is significant at the 99%. A pregnant woman who is eligible for public insurance in Oregon is more likely to drop private insurance than women in Washington and California. To understand the magnitude of our result, we add .19 (Table 3, column 6) to our crowd-out rate of -.38. Doing so tells us that a pregnant woman in Oregon who is eligible for OHP will be 19% likely to drop her private insurance plan.

C. Other Adults

The following section discusses our empirical results for the adult population, which includes both men and women between the ages of 18 and 65, excluding pregnant women. No previous studies have provided an analysis of the adult population, so we do not have benchmarks for our results as we did with children and pregnant females. Originally the plan was to determine the crowd-out and take-up rates in Oregon using the state of Washington as a control group. Unfortunately, even after extensive research, we still couldn't find the eligibility requirements for the adult population of Washington; therefore we had to look at the other states as an alternative. We decided to use California as a control group for our study. Using the data from this state for our purposes was a good choice, because it had plenty of observations (due to the large population of California) and California did not offer state-sponsored health coverage for adults, which provides an excellent control relative to OHP which began coverage of certain adult groups in 1994.

Using approximately the same demographics variables as previously, and including the dummy variables for state and year in all of our regressions, Table 4 shows our regression output for adults.

Table 4: Take-up and Crowd-out Rates for Adults

Variables:	Public Insurance		Private Insurance	
	Basic w/ State & Year Dummy [R ² =.32]	Regression with copay event [R ² =.32]	Basic w/ State & Year Dummy [R ² =.74]	Regression with copay event [R ² =.74]
adult eligibility	0.318** [230.20]	0.321** [200.64]	-.327** [-28.06]	-.325** [-24.04]
# workers in house	-0.0001 [-1.44]	-0.0002 [-1.49]	-0.001 [-0.63]	-0.001 [-0.63]
age	0.00001 [.90]	0.00001 [.91]	0.003** [28.71]	0.003** [28.71]
white	-0.0001 [-.33]	-0.0001 [-.33]	-0.015 [-4.60]	-0.015 [-4.60]
# ppl in household	-0.0001 [-1.40]	-0.0001 [-1.01]	-.049** [-64.09]	-.049** [-64.09]
married couple	-.004** [-10.99]	-.004** [-10.99]	.080** [23.81]	.080** [23.81]
male head of house	-.006** [-11.64]	-.006** [-11.65]	-0.053** [-12.95]	-0.053** [-12.95]
family income	7.75e-09** [2.72]	7.65e-09** [2.68]	2.00e-06** [83.10]	2.00e-06** [83.10]
employed	-.002** [-4.70]	-.002** [-4.71]	.169** [55.76]	.169** [55.76]
ohp_event		-.013** [-4.30]		-0.007 [-0.30]

Notes: “***” denotes statistical confidence of 99% that the coefficient is different from zero. The t-statistics are in brackets.

Unlike with children and pregnant women, there are no previous studies on the health insurance coverage of the adult population. Therefore we cannot compare our estimates with previous studies. In general, our results are consistent with our expectations, and our regression output had relatively high R², such as .32 and .74. When

we run the adult regression, we find that for every individual who is eligible for public insurance, there is a 31.8% probability that the individual will take-up a public insurance plan. At the same time we find a 32.7% drop in private insurance coverage, which means that for every individual who is eligible there is a 32.7% likelihood that he or she will drop private coverage. This is somewhat surprising because being eligible results in a drop-off in private insurance that is greater than the take-up of public insurance. Based on our estimates, crowd-out is greater than 100%-- 103% to be exact. The fact that we estimate crowd-out to be higher than 100% suggests that we may have omitted variable bias in our estimates.

Because the restructuring of OHP affected the adult population the most, the estimates of the 2003 OHP changes for adults should be dramatic. With public insurance as the dependent variable, we see that the coefficient for the OHP event interaction variable is negative and statistically significant. Thus, after 2002, the take-up rate among adults went down considerably. This result is consistent with our expectations. The OHP event did not, however, affect private insurance drop-off. Fewer people are taking up public insurance after 2002, but we cannot confidently say that there is any difference in the private insurance drop-off during this time.

Just as we did for children and pregnant women, we wanted to examine the Oregon-specific effects of Medicaid expansions for the adult population. However, since California does not have a program offering insurance for the general adult population, and we excluded Washington from the adult regressions as a result of not being confident in the eligibility levels for adults in Washington, the results for our overall regression represent Oregon-specific changes.

D. Crowd Out and Take Up Effects of the Different Income Level Groups

Now that we have determined the take up and crowd out rates of children, women, and adult populations as a whole, we were also interested in going beyond what previous research has covered in observing whether these trends were different if we break up the population by income level. Primarily, we wanted to see whether the lower income bracket was affected differently by expansions in Medicaid. We, therefore, include a variable that allows us to examine possible differences among the 0-50% of FPL population. The regression looks like the following:

$$\text{stateins}_i = B_0 + B_1 a_elig_i + B_2 a_elig50_i + B_3 X_i + u_i$$

Where a_elig50 stands for those eligible adults below 50% of FPL, and X stands for a set of demographic variables includes: hhwork, age, white, numper, marcouple, malehh, sex, and Oregon. We run a similar regression for all three groups: children, pregnant women, and adult males. Below is the table of our results:

Table 5: Effect of Medicaid Expansions on Lower Income Groups

<i>Population Subset:</i>	Take-up Rate		Crowd-out Rate	
	Original Regression	0-50% of FPL	Original Regression	0-50% of FPL
Children	0.4047**	0.4505**	-0.0305**	-0.039**
Pregnant Females	0.2804**	0.3781**	-0.3693**	-0.4772**
Adults	0.3178**	0.2936**	-0.3266**	-0.3573

Note: “**” indicates statistical significance at the 99% level

For children below 50% of the poverty level we observe a higher level of take-up relative to the entire sample of children. The same is true for pregnant women, whose take up rate increased by 34.8% (.098 percentage points) if they fall into the income group below 50% of FPL. Crowd-out rates also differ among the 0-50% of FPL group. For both

children and pregnant women, crowd-out increases. So far, we see the evidence that the state insurance serves its purpose by increasing its coverage for the poorest of the poor.

For the adult population, we see very different results. The poorest part of the population, with incomes below 50% of FPL, actually have a lower take-up rate than the overall population. There is a 7.6% decrease in the take-up rate among this group. This result is not that surprising, since the lowest income adults may have difficulty getting on OHP if they do not have a steady address or phone number. The crowd-out is again slightly higher but not significantly different between the income groups. Adding in a variable “ohp_event” (introduction of copayments after 2002) did not produce different results.

VII. Summary of Results

To reiterate, after running our regressions, we determined that if a child is eligible for a Medicaid program, the probability that the child will take-up public insurance is 40.5%. Being eligible also results in a likely 3.1% decline in private insurance coverage. Thus, we calculate crowd-out for children to be 7.7%. This value is substantially smaller than Cutler and Gruber’s estimate of a 31.5% crowd-out for children. This difference could be attributed to variations in methodology between our model and that of Cutler and Gruber, trends over time (changes from 1992-2003), or regional specificities (West Coast vs. the nation as a whole).

For pregnant females, our basic regression (with year and state dummies) yielded the result that being eligible for Medicaid leads to a 28% probability of taking up public insurance and a subsequent 36.9% likelihood of dropping private coverage. Though this

greater than 100% crowd-out is difficult to explain, Cutler and Gruber also found that crowd-out for pregnant women exceeded 100%, a point which they more or less ignore.

Lastly, we find a 103% crowd-out among the adult population. This suggests that there is some other factor that is correlated with being eligible for public insurance that has an effect on dropping private insurance. Since Cutler and Gruber do not examine general adult populations, we cannot compare this result with their estimates.

Table 6: Crowd-out Estimates

Effect of Medicaid Expansions on Insurance Coverage			
Coverage of:	<u>Change in probability of being covered</u>		Crowd-out
	Public	Private	
Children	0.405	-0.031	7.7%
Pregnant Females	0.280	-0.369	132%
Other Adults	0.318	-0.327	103%
Total	1.003	-.665	66%

We were also especially interested in the effect of OHP program changes (higher co-pays and premiums) in 2003. For children, the co-pay event had a statistically significant effect on private insurance drop-off, causing drop-off to be even more extreme. This result is not surprising given that Medicaid eligibility for children actually increased in the years after 2002. For adults, take-up rates, rather than drop-off rates were affected. After 2002, take-up rates for adults in Oregon went down. Since the newly implemented program changes made it more difficult to participate in OHP (and the state ultimately capped the program), this result is exactly what we would expect.

VIII. Concluding Remarks

Our research and analysis contributed several key features to the pre-existing literature on the effects of increases in eligibility on health insurance coverage. For one, we narrowed the study to include observations from only the West Coast (Washington, Oregon, and California), and added an interaction term to pick-up differences in the results for Oregon in particular. While this change from the initial national analysis may not be an improvement, per se, the results from our more focused study provide Oregon-specific results, which could be useful for health specialists and policymakers. Secondly, our project contributes to earlier studies by expanding the years covered. The most current literature (to our knowledge) on this issue up until now was that of Shore-Sheppard, and her analysis stopped at 1995. In order for this project to remain a resource for people in the field of health policy, it is important for the research to be current. Thirdly, our paper looks at the effects of Medicaid expansions on the non-pregnant female adult population. Since there is no federal mandate for states to provide health insurance to adults 19-65 (not including pregnant women), many states do not provide Medicaid assistance to these people. Cutler and Gruber do not address adults in their paper since most Medicaid programs that offer some form of public health insurance to low-income adults did not come into effect until the mid-1990s, after their study had already been completed.

We are fortunate to be able to use Oregon as the focus of our study. Oregon is one of the 14 states in the United States to provide some kind of Medicaid assistance to adults, including adults without children. Considering the fact that “low-income adults without

dependent children are more likely to be uninsured than are any other Americans”¹, research in this area is particularly relevant. In addition, since it is mostly adults 19-65 who are in the work force, it seems appropriate to have some analysis of whether these people are switching from employer-sponsored plans and taking up a public insurance program.

Future opportunities for research in this area could look at the actual costs to the state of individuals switching over from employer or privately-sponsored insurance plans to a state insurance program such as OHP. Additional funding goes into a program like the Oregon Health Plan in order to increase the eligibility levels, but if uninsurance levels remain constant, and previously covered individuals merely switch over in hopes of acquiring a cheaper plan, then the goal of expanding public insurance is not met, and the state incurs more costs. Based on the initial finding that crowd-out does occur, future researchers could potentially examine the financial implications of such crowd-out.

Finally, given that we found significant evidence of the “substitution effect” (i.e. crowd-out), we must consider the potential policy implications of our findings. The first question our results may elicit is whether expanding Medicaid programs is worth it. Certainly the state or federal government may incur more costs, and no more people may be covered, however, we cannot judge whether this is an overall welfare loss. The individuals switching over to public insurance plans may be saving money and may be receiving better benefits. As such, it would be difficult to analyze whether Medicaid expansions ought to be further pursued or restricted.

¹ Dorn, Stan et al (2004). “Medicaid and Other Public Programs for Low-Income Childless Adults: An Overview of Coverage in Eight States.” Kaiser Commission on Medicaid and the Uninsured. <http://www.statecoverage.net/statereports/multi34.pdf>

Appendix A: Variables Used in Regressions

Variable:	Continuous/Dummy	Description
numper	x	Indicates the number of people in the household. Explanatory variable.
sex	x	Dummy variable that equals 2 if female, 1 if male. Explanatory variable.
age	x	Continuous variable indicating the age of the individual. This variable is an independent variable, and was also used to code up the eligibility variable.
hhwork	x	Continuous variable measuring the number of workers in the household. Explanatory variable.
year	x	Continuous variable that measures what year it is. We used this variable to code up individual year dummies, e.g. 1 if year=2000, 0 otherwise.
state	x	This variable ascribes a number to every state, e.g. the code for Oregon is state=92. We used this variable to code up state dummies.
faminc	x	Continuous variable indicating family income. This variable is both an independent variable, and was used to code up the eligibility variable.
emp	x	Dummy variable that assumes the value of 1 if employed, 0 otherwise. This variable was taken from the variable "_esr". Explanatory.
ch_elig	x	Child eligibility dummy. This variable is a function of family income, number of people in the family, age of the individual, state elig. requirements, and FPL.
pf_elig2	x	Pregnant female eligibility dummy. A woman is assumed to be pregnant if there is an infant in the household. Once determined pregnant, same function as child.
a_elig	x	Adult eligibility dummy that equals 1 if eligible for public health insurance, 0 otherwise. Function of all the same components mentioned under ch_elig.
marcouple	x	Dummy variable indicating whether a married couple is the head unit of the household. Explanatory variable.
malehh	x	Dummy variable indicating whether a male is the head of household.
white	x	Dummy variable that equals 1 if white, 0 otherwise. Taken from the variable "_race." Explanatory variable.
stateins	x	Dependent, dummy variable that equals one if the individual has state/public health insurance (Medicaid), 0 otherwise.
othins	x	Dependent, dummy variable that equals one if the individual has private or employer-sponsored health insurance, 0 otherwise.

Appendix B: Eligibility Table

Percent of Federal Poverty Line Necessary for Public Health Insurance Coverage

	Infants & Children < 6			Children (ages 6-18)			Adults (ages 19-64)			Pregnant Women		
	OR	CA	WA	OR	CA	WA	OR	CA	WA	OR	CA	WA
1990	85% ²	185% ³	185% ⁴	n/a	n/a	n/a	n/a	n/a	200%	85%	185%	185%
1991	133%	185%	185%	100%	100%	100%	n/a	n/a	200%	133%	185%	185%
1992	133%	185%	185%	100%	100%	100%	n/a	n/a	200%	133%	185%	185%
1993	133%	185%	185%	100%	100%	100%	n/a	n/a	200%	133%	185%	185%
1994	133%	[200%] ⁵ [133%] ⁶	200%	100%	100%	200%	100%	n/a	200%	133%	185%	185%
1995	133%	[200%] [133%]	200%	100%	100%	200%	100%	n/a	200%	133%	200%	185%
1996	133%	[200%] [133%]	200%	100%	100%	200%	100%	n/a	200%	133%	200%	185%
1997	133%	[200%] [133%]	200%	100%	100%	200%	100%	n/a	200%	133%	200%	185%
1998	170% ⁷	200%	200%	170%	200%	200%	100%	n/a	200%	170%	300%	185%
1999	170%	200%	250%	170%	200%	250%	100%	n/a	200%	170%	300%	185%
2000	170%	200%	250%	170%	200%	250%	100%	n/a	200%	170%	300%	185%
2001	170%	200%	250%	170%	200%	250%	100%	n/a	200%	170%	300%	185%
2002	170%	200%	250%	170%	200%	250%	100%	n/a	200%	170%	300%	185%
2003	170%	200%	250%	170%	200%	250%	100%	n/a	200%	170%	300%	185%

² Covers children up to age 4

³ Covers infants only (up to age 1)

⁴ Covers children up to age 7

⁵ Infants (up to age 1)

⁶ Children (from age 1 to age 6)

⁷ Increase in eligibility a result of SCHIP funding

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