

IMPACTS OF OREGON HEALTH PLAN DISENROLLMENT ON  
CHILDREN'S ACCESS TO HEALTHCARE

By

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CERTIFICATE OF APPROVAL

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## **TABLE OF CONTENTS**

ACKNOWLEDGEMENTS.....	ii
ABSTRACT.....	1-2
BACKGROUND.....	3-9
RESEARCH QUESTIONS & SPECIFIC AIMS.....	10
METHODS.....	11-28
RESULTS.....	28-52
DISCUSSION.....	52-61
REFERENCES.....	62-65
APPENDIX A.....	66-77
APPENDIX B.....	78-85

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## **ABSTRACT**

**BACKGROUND:** Despite recent expansions in public insurance programs, it must be recognized that the effectiveness of public insurance programs has historically been compromised by high rates of disenrollment. One key barrier to the Oregon Health Plan's (OHP) effective expansion has been the lack of a thorough understanding of why people leave the program, and what happens to them when they do. In early 2007, the Division of Medical Assistance Programs (DMAP) commissioned a study on OHP disenrollment to address these questions. This secondary data analysis of data from this study focuses on children who were disenrolled from OHP.

**RESEARCH QUESTIONS:** 1) What factors are associated with a child's disenrollment from the Oregon Health Plan? 2) What are the impacts on children whose parents do not reapply to renew their OHP coverage with regard to healthcare utilization and health outcomes? (3) What factors predict the eventual attainment of health insurance?

**METHODS:** We used data from the 2007 OHP Disenrollment Study, a prospective cohort study, which identified a random cohort of children from a group of OHP applicants and re-applicants during a three-month sampling window. Parents or guardians of selected children were surveyed six months later using a validated survey tool about their child's insurance status and healthcare utilization. To address our research questions, we performed complete descriptive analyses as well as multivariate logistic regression modeling.

**RESULTS:** 585 children participated in this survey and 392 were included in this secondary analysis. This number was weighted to reflect the total eligible OHP population during the sampling window and to account for survey non-response. Compared with those who were accepted into the program and those that were denied coverage, children whose parents did not reapply to renew their coverage were more likely to come from families with employed parents (73.3%,  $p < 0.001$ ) and annual household incomes of more than \$15,000 (40.9%,  $p < 0.001$ ). Children whose parents did not reapply to renew their coverage had higher odds of unmet

healthcare needs compared with those who were accepted into the program (OR: 2.8, 95% CI: 1.3-6.1) and those who were denied coverage (OR: 1.8, 95% CI: 0.7-4.4). This association was explained by the fact that they were more likely to have a gap in insurance coverage than those in the other application groups. A gap in insurance coverage was strongly associated with having an unmet healthcare need (OR: 8.5, 95% CI: 2.9-24.8). Approximately one-third of parents cited burdensome process requirements as the primary deterrents to their child's OHP reenrollment. These children were far less likely than those who disenrolled due to improved circumstances to be insured at the end of the study period (65.8%,  $p < 0.01$ ).

**CONCLUSIONS:** This study confirms previous findings regarding the importance of continuous insurance coverage. Furthermore, many children are being disenrolled from OHP due to burdensome process requirements. Future efforts should focus on minimizing barriers to enrollment and reenrollment in public insurance programs in order to ensure continuous insurance coverage for all children.

## **I. BACKGROUND**

### **A. IMPORTANCE OF HEALTH INSURANCE**

Stable, continuous health insurance is essential to the health and well being of all children in the United States.<sup>1-4</sup> While health insurance alone does not guarantee access to high quality health care, it plays an integral role in determining whether children have access to needed healthcare. Uninsured children are less likely than their insured counterparts to have regular contact with a healthcare provider, to receive adequate preventive care, and to have a usual source of care.<sup>1,3-5</sup> They are more likely to have unmet healthcare needs, poorer health, and hospitalizations for preventable medical problems than those with insurance.<sup>4,6-8</sup> Moreover, the adverse effects of being uninsured are often worse for children in families with lower socioeconomic status, racial or ethnic minorities, recent immigrants and the undocumented, and children in underserved areas.<sup>8,9</sup> These adverse effects are often more pronounced for children with high healthcare needs as well.<sup>9</sup>

### **B. CURRENT ESTIMATES OF THE UNINSURED**

In 2010, almost fifty million Americans were uninsured for the entire year.<sup>10,11</sup> Approximately seven to eight million of the uninsured are children.<sup>10,12</sup> However, the number of uninsured children nearly doubles if one accounts for children with coverage gaps at some point during the year.<sup>13,14</sup> Nationally, individuals of racial and ethnic minorities are more likely to be uninsured than non-Hispanic whites.<sup>11</sup> Full-time employment increases the likelihood of having insurance, though one in seven full-time workers are still uninsured.<sup>11</sup> Likewise,

individuals with lower incomes are more likely to be uninsured, although more than one-third of all uninsured Americans have household incomes above \$50,000.<sup>11</sup> Recent estimates indicate that in Oregon approximately 52,000 children are currently uninsured.<sup>15</sup> This number has decreased in recent years due to program expansions that occurred following the Children's Health Insurance Program Reauthorization Act in 2009.<sup>16</sup>

### **C. PUBLIC HEALTH INSURANCE**

As the cost of private health insurance outpaces the earnings of many American families, millions continue to rely on Medicaid and the Children's Health Insurance Program (CHIP) to provide health insurance for their children.<sup>3, 17-20</sup> Currently, more than 27 million children are enrolled in Medicaid and an additional 8 million are enrolled in CHIP.<sup>21, 22</sup> Nationally, the number of children eligible for Medicaid and CHIP has increased significantly in recent years. Economic instability due to the recession and program expansions in a number of states have contributed to this growth.<sup>21, 23, 24</sup> Between 2008 and 2009, the number of children eligible for Medicaid/CHIP increased by an estimated 2.5 million, from 40.2 million to 42.7 million.<sup>24</sup> Since the start of the recession, an additional five million children enrolled in Medicaid, which accounts for more than half of total program growth across all eligibility groups during this period.<sup>21</sup>

Established in 1965, Medicaid is a joint federal-state entitlement program for certain low-income families, children, pregnant women, and individuals who are aged or disabled.<sup>12</sup> Medicaid requires every state to provide coverage to: 1) children under age 6 and pregnant women living just above the federal poverty level (FPL),



\$29,327 for a family of four, and 2) children ages 6-19 who are at or below the FPL, \$22,050 for a family of four.<sup>11</sup> States have the option to use Medicaid funds to provide coverage to: 1) pregnant women living at up to 185% of the FPL, \$40,792 for a family of four, and 2) children at any income level.<sup>12</sup>

Recognizing that many families were earning too much to qualify for Medicaid but not enough to coverage the costs associated with private or even employer-sponsored insurance, Congress created Children's Health Insurance Program (CHIP) in 1997. This program gives federal matching dollars to states offering low cost insurance options to children in families earning too much to be eligible for Medicaid. Every state is allowed to design its program in one of three ways: as a separate program, as a Medicaid expansion, or as a combination of these two approaches. Currently, all but four states cover children at or above 200% of the FPL, \$44,100 for a family of four.<sup>12</sup>

In 2009, the President signed into law the Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA). Under this law, states were given funding to strengthen their existing health care programs and bonus payments for adopting specific enrollment and retention strategies. States were also given financial incentives if they exceeded target enrollment levels. In response to CHIPRA, the Oregon Legislature created the Healthy Kids program within the Oregon Health Authority (OHA) to expand healthcare availability for Oregon children.<sup>25</sup> Healthy Kids offers three tiers of coverage (no-cost, low-cost, and full-cost), which determine the family contribution for insurance premiums.<sup>16</sup> The no-cost tier is reserved for families making less than \$44,100 for a family of four, 200%

or less of the federal poverty level. The low- and full-cost tiers are designed for families making \$44,100 and above.<sup>16, 25</sup> In 2010 the OHA estimated Medicaid child enrollment at approximately 250,000.<sup>25</sup>

#### **D. DISENROLLMENT FROM PUBLIC INSURANCE PROGRAMS**

Despite recent expansions in coverage options, it must be recognized that the effectiveness of public insurance programs has historically been compromised by high rates of disenrollment.<sup>20, 26, 27</sup> Disenrollment, coupled with low enrollment among some groups of eligible children, has caused millions of Medicaid or SCHIP eligible children to remain uninsured.<sup>19, 20, 28-30</sup> Several recent studies of Medicaid and CHIP have demonstrated high turnover rates, with estimates ranging from 18 to 48 percent annually.<sup>4, 31</sup> In 2009, despite increased overall participation rates, more than 4 million uninsured children were eligible for Medicaid or CHIP.<sup>24</sup>

Disenrollment from public insurance programs can occur for a variety of reasons. Recipients may lose eligibility through an increase in income; they can acquire other insurance; or they can lose coverage “unintentionally”, often while still eligible.<sup>19</sup> Unintentional disenrollment may occur due to confusion about program eligibility criteria or burdensome reenrollment processes.<sup>4, 28-30</sup> Previous studies have suggested that those who disenroll unintentionally” or as a result of programmatic changes are unlikely to obtain other forms of insurance, as they typically are not able to afford the premiums associated with private commercial health insurance.<sup>26, 32, 33</sup> Importantly, much of the previous research on disenrollment has failed to distinguish between the different causes of disenrollment and the fact that each likely has different policy implications that

must be dealt with independently.<sup>4</sup> Disenrollment due to acquisition of other insurance should not be seen as a policy failure, though these individuals may still suffer short gaps in coverage. On the other hand, if individuals are leaving the program only to reenter the realm of the uninsured, this should certainly be considered a policy failure.

Although Medicaid and CHIP are free or low-cost once a child is enrolled, there are a multitude of indirect costs associated with the application or reapplication process. These indirect costs include: transportation, time lost from work, childcare, and paperwork costs.<sup>4, 30, 34</sup> Furthermore, initial application or renewal process requirements for Medicaid and SCHIP vary widely among states and are subject to frequent changes. Program participants may be required to renew coverage once or twice annually and they may be expected to provide citizenship, residence or financial documentation.<sup>19, 30, 35</sup> As a result, while many individuals can successfully maneuver this system, others cannot and may lose much needed insurance coverage.

In terms of reasons for disenrollment, previous studies have suggested that among those who disenroll, approximately one-quarter do so “intentionally and the rest disenroll because they forgot to reenroll or were confused about the process.”<sup>4</sup> With regard to predictors of disenrollment, several studies demonstrated that older children were disenrolled at higher rates and that infants are less likely to lose eligibility than older children.<sup>4, 31, 34</sup> The data on the effect of race on disenrollment has been inconsistent.<sup>4, 31</sup> In one study, boys were less likely to be disenrolled than girls, which was thought to be due to the fact that boys have higher overall

healthcare utilization than girls.<sup>4</sup>

Disruption of Medicaid or CHIP coverage due to disenrollment may result in decreased continuity of care, delays in obtaining medical care, higher unmet healthcare needs,<sup>9, 36</sup> and increased out-of-pocket and overall medical expenditures.<sup>26, 37</sup> Additionally, disenrolled children are more likely than Medicaid or CHIP-insured children to receive health care in expensive sites such as the ED or hospital and less likely to receive care in an ambulatory setting.<sup>20, 32</sup>

## **E. SIGNIFICANCE**

Although Oregon does engage in routine evaluations of its Medicaid program, one key barrier to OHP's effective implementation has been a thorough understanding of why people leave the program, and what happens to them when they do. In early 2007, the Division of Medical Assistance Programs (DMAP) commissioned a study on disenrollment from the Oregon Health Plan to help address these questions. This secondary analysis of data from the 2007 OHP Disenrollment Study focuses on individuals who chose not to reapply to renew their child's OHP coverage. Studying this group will allow us to determine the drivers behind clients' decisions not to reapply and resultant health impacts on their children.

To date there have been few comparative analyses designed to determine whether the health care utilization behaviors and health outcomes of those who disenroll from OHP resemble those of individuals denied Medicaid coverage or those of individuals accepted into the program. This information is necessary in order to more effectively address the needs of this potentially vulnerable

population. Additionally, it is important to determine whether or not children whose parents do not reapply to renew their OHP coverage eventually obtain insurance and what factors are associated with the attainment of insurance. This information will facilitate the development of appropriate interventions designed to target those who remain uninsured, as they have likely not left the program due to improved circumstances.

Oregon is continuing to discuss and implement options for expanding children's health insurance. The expansion of public programs to cover all uninsured children has considerable public support<sup>38</sup> and the State has taken measures to facilitate this goal, most recently through the implementation of the Healthy Kids Initiative.<sup>16</sup> An understanding of the reasons that parents forgo public insurance options for their potentially eligible children will be essential to ensuring the success of the efforts.

## **II. RESEARCH QUESTIONS & SPECIFIC AIMS**

**Research Question 1:** *What factors are associated with a child's disenrollment from the Oregon Health Plan?*

**Specific Aim 1:**

- A. Describe the socio-demographic characteristics of families who did not renew their child's OHP coverage; and,
- B. Compare these characteristics with those of families in the other application groups--those who applied and were accepted and those who applied and were denied coverage.

**Research Question 2:** *What are the impacts on children whose parents do not reapply to renew their OHP coverage with regard to healthcare utilization and health outcomes? Are unmet healthcare needs associated with the decision not to reapply to renew OHP coverage?*

**Specific Aim 2:**

- A. Characterize the healthcare utilization, insurance outcomes, and health status of children whose parents did not reapply to renew their OHP coverage; and,
- B. Compare the likelihood of having an unmet healthcare need among the different application groups.

**Research Question 3:** *What factors predict the eventual attainment of health insurance among those who leave OHP?*

**Specific Aim 3:**

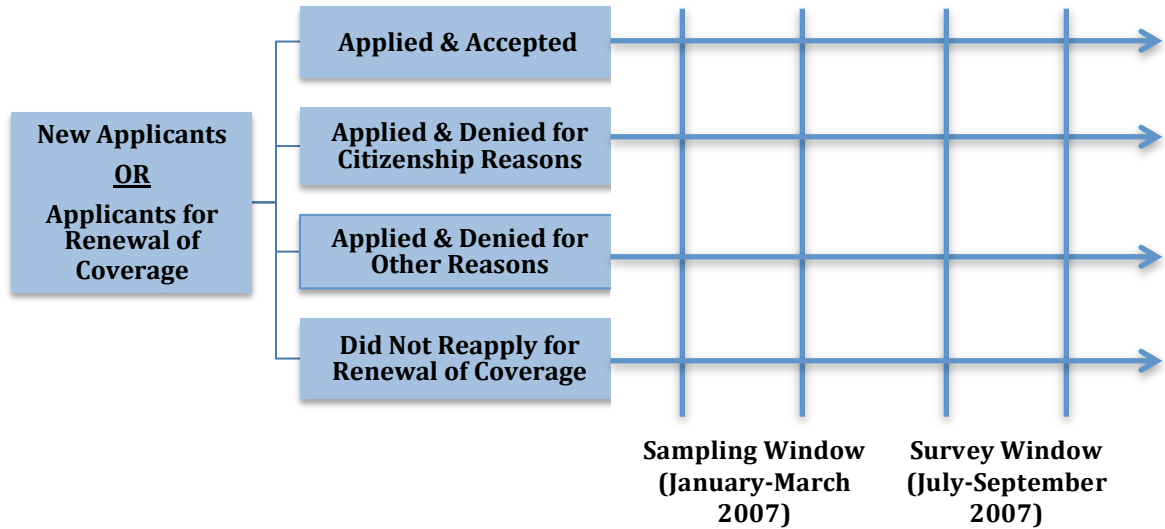
- A. Describe the insurance outcomes of children whose parents did not reapply to renew their OHP coverage;
- B. Describe the reasons for disenrollment among those who did not reapply; and,
- C. Determine what factors were associated with the attainment of health insurance in the subsequent 6 months.

### **III. METHODS**

#### **A. OVERVIEW**

This is a secondary analysis of data from the 2007 Oregon Health Plan Disenrollment Study.<sup>39</sup> The Division of Medical Assistance Programs (DMAP) commissioned the 2007 OHP Disenrollment Study to improve understanding regarding the impacts and drivers of OHP disenrollment. In this study a representative cohort of children was initially identified from a group of OHP applicants and re-applicants during a three-month sampling window, which took place between January and March of 2007. Parents or guardians of selected children were surveyed six months later using a validated instrument adapted from previous studies of the OHP population (Figure 1).<sup>39</sup>

The OHP Disenrollment Survey collected information from parents of selected children about their child's insurance status, access to and utilization of health care, and perceived health status during the six-month period following their scheduled OHP application window. The survey also collected information about the family's demographic characteristics. In addition, those who did not reapply to renew their child's coverage were questioned about what barriers to renewal they had encountered. Administrative data from DMAP, including application status as defined below, were used to identify and stratify the sample population.



**Figure 1. 2007 OHP Disenrollment Study Design**

## **B. SUBJECTS**

The 2007 OHP Disenrollment Study included children who were new applicants and re-applicants to the Oregon Health Plan as well as those who missed reapplication. This secondary analysis will be limited to children who were scheduled to reapply for coverage. New applicants were excluded because it was felt these individuals would be fundamentally different from those who had very recently been insured through the Oregon Health Plan. Specifically, this analysis focuses on children whose parents did not reapply to renew their coverage and compares their characteristics to those who were accepted into the program and those who attempted to enroll but were denied coverage. Studying this group will help to elucidate the drivers behind the client’s choice not to reapply and resultant health impacts on their children. Specific inclusion and exclusion criteria utilized in the original study are outlined in Table 1.

## **C. SAMPLING**



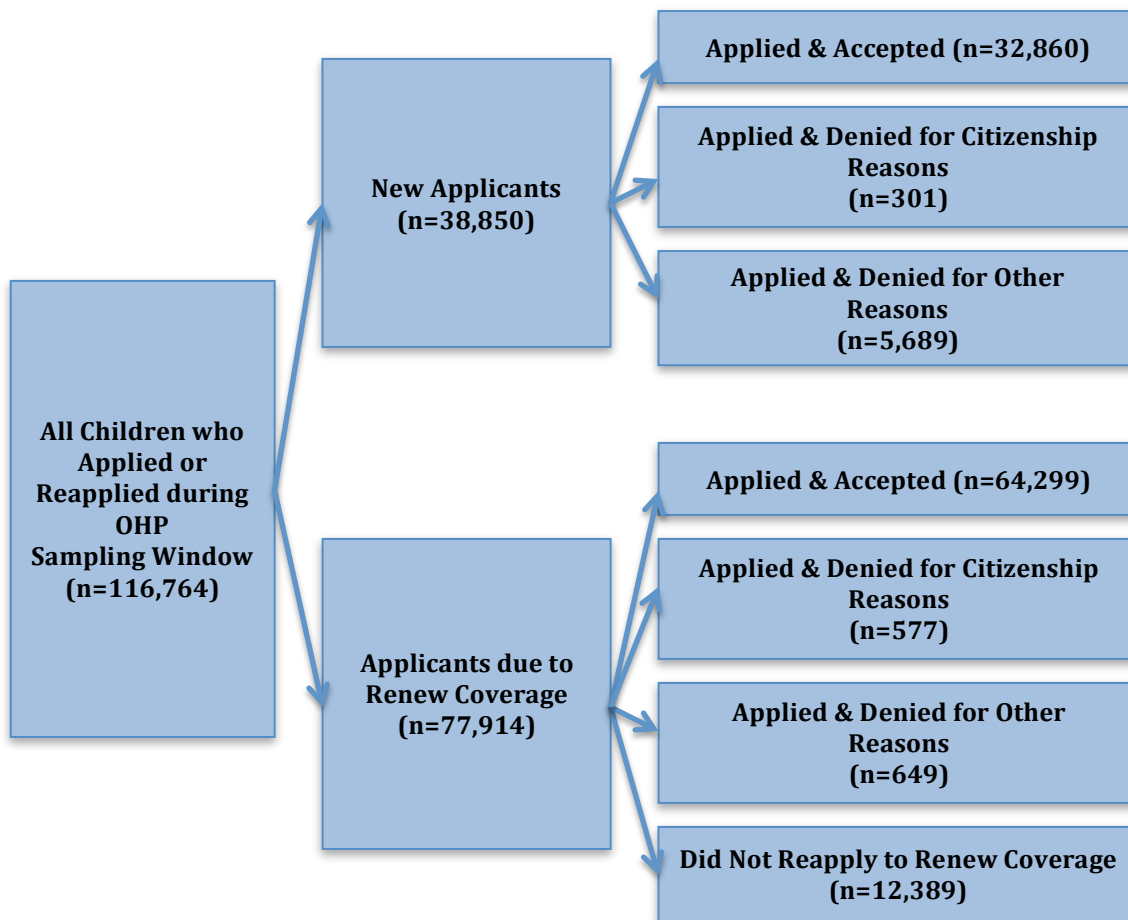
The OHP Disenrollment Study employed a multi-stage stratified random sampling technique to form a representative study panel across the four population strata. Random sampling was performed from an original population of 116,764 children (Figure 2). Investigators originally intended to recruit 500 children from four predefined strata and 1,000 from a final stratum for a total of 4,000 potential study participants (Table 7). Only one subject per household was eligible to participate. For households with multiple children, parents were asked to respond to questions only as they pertained to the focal child (Table 1).

**Table 1. Inclusion & Exclusion Criteria for Children in the 2007 OHP Disenrollment Study**

Inclusion Criteria	Exclusion Criteria
Child under 19 years of age	Individual $\geq$ 19 years of age
No child in same household already selected to participate	Child in same household was randomly selected to participate
Valid current address according to state OHP records	Listed current address according to state OHP records is invalid and no forwarding address available

#### **D. RECRUITMENT**

Approximately six months after the sampling window, in July 2007, potential subjects were mailed a postcard screener by the original investigators of the OHP Disenrollment Study in order to introduce the study (Figure 1). When the postcard screener was returned without a forwarding address, the subject was excluded. Two weeks after the arrival of the screener, the survey was delivered by mail with a prepaid response envelope and instructions for how to complete and return the survey. Those who had not returned the survey two weeks after its delivery were sent a follow-up postcard. If the survey had not been returned four weeks after its delivery, potential participants were sent a second copy of the survey and additional prepaid envelope. Participants were given a \$5 cash incentive once the completed survey was returned. The survey window was closed at the end of September 2007 and surveys received after this time were excluded (Figure 1).<sup>39</sup>



**Figure 2. Snapshot of Enrollment & Disenrollment During 3-Month OHP Disenrollment Survey Sampling Window**<sup>39</sup>

#### **D. RECRUITMENT**

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prepaid envelope. Participants were given a \$5 cash incentive once the completed survey was returned. The survey window was closed at the end of September 2007 and surveys received after this time were excluded (Figure 1).<sup>39</sup>

#### **E. DATA COLLECTION & MEASUREMENTS**

Administrative data from the Oregon Division of Medical Assistance Programs were available to identify and to stratify the sample population into the different application groups. After initial stratification, the Oregon Disenrollment Survey was the primary measurement tool. This survey was modeled after the Oregon Health Care Survey, a validated survey tool, which has been used to assess insurance coverage and access to health care among current and former Medicaid enrollees. Both Spanish and English surveys were provided based on the language preference of the parent/guardian according to state administrative records.

#### **F. DATA MANAGEMENT & WEIGHTING**

Investigators in the OHP Disenrollment Study created a database of all subjects wherein each subject was assigned a unique numeric code. Personal identifying information was removed for the remainder of the analyses. No personal identifiers remained in the data set when analyses were performed.<sup>39</sup>

Original investigators weighted the data collected in this survey to better reflect the full population. Specific information regarding weighting strategy can be found elsewhere<sup>39</sup>, but is described in brief as follows. First, they determined a base weight for each case from its probability of inclusion. Next, they adjusted the base weight to account for household size since only one individual from any given

household was selected. Finally, they implemented a non-response error adjustment by weighting each case according to response probabilities.

As demonstrated in Table 7, there is a slight discrepancy between the total weighted sample population and the actual population. These differences were likely due to minor limitations in the original regression analyses used to calculate survey weights. They were not expected to have any significant impact on the results of these analyses.

#### **G. SAMPLE SIZE & POWER**

All data for the 2007 OHP Disenrollment Study was complete when this secondary analysis was undertaken. Using the weighting procedures outlined previously, the total number of participants (n=585) was weighted to represent the full population of all children who were eligible for enrollment in Medicaid during the sampling window (n=116,764). Survey respondents who reported that their children were new applicants to OHP during this period were excluded from analysis as the intention of this analysis was to study those who were previously enrolled and due to renew their coverage. Furthermore, respondents with missing demographic data were excluded from analysis as this information was felt to be essential to the logistic regression analysis. Detailed information regarding the exclusion of missing data can be found in Tables 23-24 (Appendix A). After these exclusions, the total number of respondents included in these analyses was 392.

We performed numerous two-sided tests of proportions using Russell Lenth's Power Calculation Tool<sup>40</sup> in order to determine the minimum detectable differences between proportions that could be observed while maintaining a power

of 0.80 at a significance level of 0.05. Since children whose parents did not reapply to renew their OHP coverage (n=183) were evaluated against two comparison groups, the calculations were performed twice, once with those who were denied coverage (n=112) and once with those who were accepted into the program (n=97).

For specific aims 1 & 2, we estimated that a difference in proportions of approximately 15-18% between the comparison groups was needed to maintain adequate power (Table 3). For specific aim 3, we were only interested in the group that did not reapply to renew OHP coverage. Therefore, we compared the number of children within this group who had insurance (n=118) at the end of the 6-month study period with those who did not have insurance (n=60). We estimated that a difference in proportions of approximately 21-23% between the comparison groups was needed to achieve maintain adequate power (Table 3).

The exact proportions of our outcome variables were unknown prior to the initiation of our analyses. However, based on previous studies, we expected the actual proportions to be contained within the wide range of our estimated values. These calculations do not account for survey weights of the study. Given that the design effect of the original 2007 OHP Disenrollment study is close to one<sup>39</sup>, weighting does not significantly change the statistical power of this study.

**Table 2. Minimum Detectable Differences for Specific Aims 1 & 2**

Comparison Groups	Initial Proportions	Difference (P2-P1)	Power	Alpha
<b>Did Not Reapply (n=183) vs. Applied &amp; Denied (n=112)</b>	P1=0.5 vs. P2=0.67	0.17	0.80	0.05
	P1=0.4 vs. P2=0.58	0.18	0.80	0.05
	P1=0.3 vs. P2=0.47	0.17	0.80	0.05
	P1=0.2 vs. P2=0.35	0.15	0.80	0.05
<b>Did Not Reapply (n=183) vs. Applied &amp; Accepted (n=97)</b>	P1=0.5 vs. P2=0.68	0.18	0.80	0.05
	P1=0.4 vs. P2=0.58	0.18	0.80	0.05
	P1=0.3 vs. P2=0.475	0.175	0.80	0.05
	P1=0.2 vs. P2=0.36	0.16	0.80	0.05

**Table 3. Minimum Detectable Differences for Specific Aim 3**

Comparison Groups	Initial Proportions	Difference (P2-P1)	Power	Alpha
<b>Uninsured (n=60) vs. Insured (n=118)</b>	P1=0.5 vs. P2=0.72	0.22	0.80	0.05
	P1=0.4 vs. P2=0.63	0.23	0.80	0.05
	P1=0.3 vs. P2=0.53	0.23	0.80	0.05
	P1=0.2 vs. P2=0.41	0.21	0.80	0.05

## H. VARIABLES & ANALYSIS

### H.1 SPECIFIC AIM 1

To address the first specific aim, contingency tables were constructed to compare the demographic characteristics of each application group. Information about application status was obtained from administrative data gathered by the Department of Medical Assistance Programs in Oregon. For the purposes of this analysis, application status was treated as a three-level categorical variable: 1) those who did not reapply to renew OHP coverage, 2) those who did reapply and were denied coverage and 3) those who did reapply and were accepted into the program.

The demographic characteristics of interest in this aim are described in more detail in Table 4. As outlined below, the variable for age was dichotomized at a

several different cut-points and treated as a three-level categorical variable in multivariate logistic regression models. Therefore, these divisions were utilized in order to elucidate whether these relationships were also present in this study. The variable for income was dichotomized as well. In 2006, the year prior to when this survey was conducted, the federal poverty level for a family of two was approximately \$15,000 and, for a family of four, approximately \$23,000.<sup>41</sup> Precise estimates of family size were frequently unavailable in the collected survey data. Therefore, an annual income cut-off of \$15,000 was felt to be a conservative estimate of poverty in this population.

Weighted analyses of the aforementioned contingency tables were performed using Stata 11.2.<sup>42</sup> Design-based F tests were applied to weighted data analyses to evaluate whether global differences existed among the three comparison groups and weighted percentages in each application group were reported. Furthermore, in order to more fully characterize the nature of these global differences, families who did not renew their child's OHP coverage were compared separately with those who were accepted into the program as well as those who were denied coverage.

**Table 4. Variables for Specific Aim 1**

<b>Variable</b>	<b>Survey Question</b>	<b>Response</b>	<b>Coding</b>
<b>Application Status</b>	<i>Data from DMAP</i>	- Applied & accepted - Applied & denied - Did not reapply	<b>Categorical</b> (3-Level)
<b>Gender</b>	Is your child male or female?	- Male - Female	<b>Dichotomous</b> - Male - Female
<b>Age</b>	What year was your child born?	<i>Write in year.</i>	<b>Dichotomous</b> - ≥2 years vs. <2 years - <12 years vs. ≥12 years  <b>Categorical (3-Level)</b> - ≤2years - >2 & <12 years - ≥12 years <i>*For multivariate logistic regression models only</i>
<b>Race</b>	How would you describe your child's race?	- White - Black or African American - American Indian or Alaska Native - Native Hawaiian or Pacific Islander - Other	<b>Dichotomous</b> -White -Non-white
<b>Ethnicity</b>	Would you describe yourself as Spanish, Hispanic or Latino?	-Yes -No	<b>Dichotomous</b> - Hispanic - Non-Hispanic
<b>Birthplace</b>	Was your child born in United States?	- Yes - No	<b>Dichotomous</b> -U.S. Born - Foreign Born
<b>Parental Education</b>	What is the highest level of education you have completed?	- Less than high school - High school diploma or GED - Vocational training or 2-year degree - A 4-year college degree or more	<b>Dichotomous</b> - ≤High School - >High School
<b>Parental Employment</b>	Are you (the parent) currently employed or self-employed?	- Yes, employed (1) - Yes, self-employed (2) - Not currently employed (3) - I am retired (4)	<b>Dichotomous</b> -Employed (1 or 2) - Unemployed (3 or 4)
<b>Household Income</b>	What was your gross household income (before taxes and deductions are taken out) last year (2006)?	- \$0 - \$1 - \$2,500 - ...(\$2,500 intervals)... - \$47,500 - \$50,000 - \$50,001 or more	<b>Dichotomous</b> - ≤\$15,000 - >\$15,000
<b>Chronic Disease</b>	Have you ever been told by a doctor or other health professional that your child has any of the following?	- Asthma - Diabetes or sugar diabetes - Another chronic health condition	<b>Dichotomous</b> - Chronic condition - No chronic condition



## **H.2 SPECIFIC AIM 2**

To address the second specific aim, contingency tables were constructed to compare the health status and the healthcare utilization behaviors of children in each of the three application groups. A variety of outcomes were assessed, including: the presence of unmet healthcare needs, use of the emergency department in the last six months, having a medical visit in the last six months, having a usual source of care, having current debt because of medical bills, having difficulty paying medical bills, and having a change in health over the last six months (Tables 5a-b). Design-based F tests were applied to weighted data analyses in order to evaluate whether global differences existed among the three comparison groups and weighted percentages in each application group were reported.

In addition, we were specifically interested in whether or not those children whose parents did not reapply to renew their OHP coverage (i.e. those who “disenrolled” from OHP) were more likely to have unmet healthcare needs than those in the other application groups. Therefore, multivariate logistic regression was utilized to assess the relationship between our primary predictor variable, OHP application status, which was treated as a three-level categorical variable and the presence of one or more unmet healthcare needs (Table 5a). An unmet health care need was defined as a “no” response to one or more of three separate questions regarding ability to access medical care, dental care and prescription medications. Children with no medical, dental or prescription needs were excluded from these analyses. Again, contingency tables were utilized to identify potential confounders or effect modifiers of the primary relationship of interest. The demographic

characteristics described in Table 4 were considered in this portion of the analysis and those variables that were associated with either the predictor or outcome variable ( $p$ -value $<0.25$ ) were included in our preliminary main effects model. We also included those variables that we theorized should have an effect on either the predictor or outcome variables.

Once the preliminary main effects model was determined, a backwards-stepwise modeling procedure was undertaken. Variables that achieved statistical significance ( $p<0.05$ ) as well as those that contributed significantly to the model were included in the final main effects logistic regression model. After the final main effects model was selected, interactions between application status and a number of other independent variables were assessed for statistical significance. Adjusted odds ratios and 95% confidence intervals for the association between each OHP application status and the outcome of having one or more unmet healthcare needs were calculated and are reported below. Model fit was assessed using a Hosmer & Lemeshow F-adjusted mean test for complex weighted samples.<sup>43</sup>

**Table 5a. Variables for Specific Aim 2**

Variable	Survey Question	Response	Coding
<b>Application Status (Primary Predictor)</b>	<i>Data from DMAP</i>	- Applied & accepted - Applied & denied - Did not reapply	<b>Categorical</b> (3-level)
<b>Unmet Healthcare Need (Primary Outcome)</b>	1. If your child needed medical care in the last six months, did he or she get ALL the medical care that was needed?	-Yes -No	<b>Dichotomous</b> - Unmet need (Yes, to ≥ 1 of the 3 questions) - No unmet need
	2. If your child needed prescription medications in the last six months, did he or she get ALL the needed medications?	-Yes -No	
	3. If your child needed dental care in the last six months, did he or she get ALL needed care?	-Yes -No	
<b>Usual Source of Care</b>	Is there a place your child usually goes to receive medical care?	-Yes -No	<b>Dichotomous</b> -Has USC - No USC
<b>Recent Medical Visit</b>	In the last 6 months, how many times did your child go to a doctor's office, clinic, or other health care provider to get care? <i>Don't include emergency room or hospital visits.</i>	- None - 1 time - 2 times - 3 or more times	<b>Dichotomous</b> - No visits - ≥ 1 visit
<b>Recent ED Visit</b>	In the last 6 months, how many times did your child go to an emergency room to get care?	- None - 1 time - 2 times - 3 or more times	<b>Dichotomous</b> - No ED visits - ≥ 1 ED visits
<b>Current Medical Debt</b>	Do you currently owe money to a health care provider, credit card company, or anyone else for your child's medical expenses?	-Yes -No	<b>Dichotomous</b> -Has medical debt - No medical debt

**Table 5b. Variables for Specific Aim 2**

<b>Variable</b>	<b>Survey Question</b>	<b>Response</b>	<b>Coding</b>
<b>Continuous Insurance</b>	For how many of the last six months did your child have some kind of health insurance?	- No insurance for last 6 months (1) - 1 . . . 5 months (2) - Insured for all of last 6 months (3)	<b>Dichotomous</b> -Continuous (3) -Discontinuous (1 or 2)
<b>Current Insurance Status</b>	Does your child currently have health insurance through any of the following? <i>Check all that apply.</i>	- OHP or Medicaid (1) - Medicare (2) -Yours or family member’s employer (3) - A private plan I pay for myself (4) - Other coverage: ____ (5) - My child has no insurance now (6) - I don’t know (7)	<b>Dichotomous</b> -Insured (1-5) -Uninsured (6)
<b>Child’s Overall Health</b>	In general, would you say your child’s health is:	- Excellent - Very Good - Good - Fair - Poor	<b>Dichotomous</b> -Poor-Fair - Good-Excellent
<b>Change in Health Status</b>	How has your child’s health changed in the last six months?	-Gotten better (1) -About the same (2) -Gotten Worse (3)	<b>Dichotomous</b> - Not declined (1 or 2) - Declined (3)
<b>Health Interfering with Daily Activities</b>	In the past six months, have problems with your child’s health interfered with any of the following? <i>Check all that apply.</i>	- School - Social activities with friends - Family activities	<b>Dichotomous</b> - Yes (Any) -No

**H.3 SPECIFIC AIM 3**

For the third specific aim, our analysis was limited to children whose parents did not reapply to renew their OHP coverage. The primary outcome variable was the child’s insurance status at the time the survey was completed, which was treated as a two-level categorical variable (Insured vs. Uninsured). Contingency tables were created to determine whether the family’s socio-demographic characteristics or the child’s health status were predictors of the child’s attainment of health insurance by the time of survey completion (Table 6). In addition, we considered whether or not the parent’s stated reason for OHP disenrollment was an important predictor of this

outcome as well. In order to do this it was necessary to experiment with a number of ways classifying reasons for disenrollment, which are outlined in Table 6. Ultimately, we chose to broadly classify the reasons for disenrollment as either due to burdensome process requirements or improved circumstances. Certainly, we recognize that dichotomous descriptions will not be able to capture the entire spectrum of these individuals' motivations. Nevertheless, this classification scheme proved to be helpful and informative for the purposes of these analyses. Potential responses for those whose disenrollment was due to improved circumstances included: "My income or assets were too high" or "I found other insurance for my child". Potential responses for those whose disenrollment was due to burdensome process requirements included: "The paperwork is too much of a hassle", "I couldn't find my paperwork to prove child's citizenship", "I could not find other paperwork (proof of income, etc.)", or "I just forgot". Individuals who claimed that they "Did reapply" to renew their child's OHP coverage were excluded from these analyses. In addition, those who cited "Some other reason" or "I don't know why" as their reason for disenrollment were excluded because it would have been impossible to classify them appropriately.

Ultimately, variables that were associated with our outcome variable based on these weighted contingency tables ( $p < 0.25$ ) or had some theoretical relevance were included in our preliminary main effects model. Then, a backwards-stepwise model building procedure was utilized and variables that achieved statistical significance ( $p < 0.05$ ) as well as those that contributed significantly to the model were included in the final main effects logistic regression model.<sup>43</sup> Interactions

between numerous independent variables were assessed and included if they were found to be statistically significant as well. Finally, we assessed our final multivariate logistic regression model for goodness of fit utilizing an F-adjusted mean residual test for complex weighted samples.<sup>43</sup>

**Table 6. Variables for Specific Aim 3**

Variable	Survey Question	Response	Coding
<b>Current Insurance Status</b>	Does your child currently have health insurance through any of the following? <i>Check all that apply.</i>	- OHP or Medicaid (1) - Medicare (2) - Yours or family member's employer (3) - A private plan I pay for myself (4) - Other coverage: ____ (5) - My child has no insurance now (6) - I don't know (7)	<b>Dichotomous</b> - Insured (1-5) - Uninsured (6)
<b>Continuous Insurance</b>	For how many of the last six months did your child have some kind of health insurance?	- No insurance for last 6 months (1) - 1 . . . 5 months (2) - Insured for all of last 6 months (3)	<b>Dichotomous</b> - Continuous (3) - Discontinuous (1 or 2)
<b>Insurance Type</b>	Does your child currently have health insurance through any of the following? <i>Check all that apply.</i>	- OHP or Medicaid - Medicare - Yours or family member's employer - A private plan I pay for myself - Other coverage: ____ - My child has no insurance now - I don't know	<b>Categorical</b> - Private Insurance - Public Insurance - Uninsured
<b>Reason for Disenrollment</b>	Our records show that your child's Oregon Health Plan (OHP) membership expired between September 2006 and May 2007, and that you did NOT reapply at that time. Why didn't you reapply to OHP for your child? <i>Check all that apply.</i>	- My income or assets were too high (1) - Found other insurance for my child (2) - I just forgot (3) - The paperwork is too much of a hassle (4) - I was dissatisfied with the program (5) - I could not find my paperwork to prove child's citizenship (6) - I could not find other paperwork (proof of income, etc.) (7) - Some other reason: ____ (8) - I don't know why (9) - I did reapply for my child's coverage during that time period (10)	<b>Categorical</b> - Income Too High (1) vs. Other (2-9) - Burdensome Process (3,4,6,7) vs. Improved Circumstances (1,2)  <i>*Individuals who cited some other reason (8) did not cite a reason (9) or thought they did reapply (10) were excluded in multivariate logistic regression modeling</i>

#### **H.4 COLLINEARITY**

In order to determine whether or not variables were too similar to be evaluated concurrently in the subsequent multivariate modeling, multiple variables were evaluated for collinearity using simple logistic regression. Variables were considered to be too similar if the simple logistic regression yielded an odds ratio of  $<0.5$  or  $>2.0$  to be included in the model separately without additional consideration and justification.<sup>43</sup> Based on these criteria, the decision was made to create a combined variable for race and ethnicity (OR: 5.371,  $p=0.001$ ) as well as poverty and employment (OR: 0.245,  $p<0.001$ ) (Appendix A, Table 25). In addition, numerous other variables were found to be highly collinear but were retained independently due to the fact that each provided unique information about the individual. Thus, using the dichotomous combined variable for race and ethnicity individuals were classified as white, non-Hispanic or non-White or Hispanic. Using the dichotomous, combined variable for poverty and employment individuals were classified based on the presence of one or more risk factors for socio-economic instability. Those who were classified as socio-economically unstable reported either being unemployed or having an annual household income of \$15,000 or less or both.

#### **H.5 MISSING DATA**

Surveys with missing demographic information were excluded from analyses if the variable was relevant to the research question being addressed. Furthermore, surveys with missing age data were excluded outright, given that it would have been impossible to determine whether individuals in question were less than 19 years

old at the time of survey completion. Imputation of demographic information was not considered to be a viable option as this would inevitably lead to imprecise misclassification. Of all eligible survey respondents, 72 out of 392 (18.4%) had missing demographic information.

Characteristics of those with complete surveys as compared to those with incomplete surveys are described in detail (Appendix A, Tables 23-24). Parents who returned incomplete surveys were more likely to have a non-white or Hispanic child. Furthermore, these children were more likely to be less than 2 years old and to come from Spanish-speaking households. The difference in race was statistically significant and the other differences trended towards significance. In addition, those with complete surveys were more likely to have continuous insurance throughout the study period than those with incomplete surveys (Appendix A, Table 24).

## **IV. RESULTS**

### **A. STUDY PARTICIPATION**

The original investigators estimated that 116, 674 children either applied to or were scheduled to reapply for OHP coverage during the three-month sampling window (Figure 2). They had intended to survey approximately 4,000 participants drawing from the five population strata listed below (Table 7). However, due to the fact that sufficient numbers were not present in one of the strata (i.e. there were only 301 new applicants denied for citizenship reasons), they were only able to survey 3,801 families.



The OHP population is a highly mobile one and, as such, their addresses change frequently. As outlined previously, the original investigators sent postcards to individuals at their on-file addresses and also used commercially available tracking databases to identify replacement addresses for those who could not be reached initially. Despite these efforts, valid addresses could not be found for approximately 18% of these families.<sup>39</sup>

Out of the 2,925 individuals with valid addresses, 585 individuals returned the surveys, which yielded a survey response rate of 20% (Table 7). Achieving a high response rate on any survey of the Medicaid population, particularly a disenrollment survey, is challenging and, in fact, this response rate is slightly lower than that of other surveys of Medicaid populations.<sup>7, 44, 45</sup> Nevertheless, inclusion of a non-response weight in this survey reduces the potential for non-response bias.

Response rates were approximately equal across all strata and slightly lower among new applicants who applied and were denied coverage. However, given that new applicants were excluded from these analyses, this discrepancy had no impact on our results. After excluding new applicants, the number of individuals included in this secondary analysis was 392 (Table 7).

**Table 7. Survey Response in 2007 OHP Disenrollment Study**

Population Strata	OHP Population	Desired Sample	Actual Sample	Eligible*	Responded **	Weighted
<b>New Applicant: Accepted</b>	32,860	500	500	461	93 (20.2%)	32,487
<b>Re-Applicant: Accepted</b>	64,299	500	500	473	101 (21.3%)	61,867
<b>New Applicant: Denied (Citizenship &amp; Other Reasons)</b>	5,990	1,000	801	542	87 (16.1%)	6,389
<b>Re-applicant: Denied (Citizenship &amp; Other Reasons)</b>	1,226	1,000	1000	589	113 (19.2%)	1,172
<b>Did Not Reapply</b>	12,389	1,000	1,000	860	191 (22.2%)	12,080
<b>Total</b>	<b>116, 674</b>	<b>4,000</b>	<b>3,801</b>	<b>2,925</b>	<b>585 (20.0%)</b>	<b>114,015</b>

\* Eligibility was determined among potential participants with valid address by inclusion/exclusion criteria described in Table 1.

\*\* The unweighted percentage cited here equals the proportion of eligible individuals who completed the survey within each population strata.

## **B. GENERAL CHARACTERISTICS OF CHILDREN IN THE 2007 OHP DISENROLLMENT STUDY POPULATION**

Initial analyses of weighted data revealed that the vast majority of children who were applied to or reapplied to the Oregon Health Plan during the sampling window were accepted into the program (Appendix A, Table 25). In addition, it appears that the reenrollment process is not as burdensome as the initial enrollment process for new applicants. Only two percent of children who were reenrolling were denied coverage compared with approximately seven percent who were denied when applying for new coverage. Overall, it was more common for children to be disenrolled from OHP rather than to reapply and be denied coverage (Appendix A, Table 25).

Collectively, children in this study ranged in age from 1 month to 18 years with a median age of 8 years. After the exclusion of new applicants, weighted analyses of survey respondents revealed that approximately half of the children in this study were male (51.5%). Almost three-quarters of children in this study were white (75.0%) and non-Hispanic (70.0%). Furthermore, the vast majority was reportedly born in the United States (93.5%). Less than one-quarter identified Spanish as the primary language spoken in the household (15.6%). More than two-thirds of children came from households where the parent or guardian reported an educational attainment of high school or less (70.7%). More than half of their parents or guardians were unemployed at the time of survey administration (54.6%). More than half came from families with an annual household income of \$15,000 or less (61.8%). Almost one-quarter of these children were reported to have a chronic disease such as diabetes or asthma (23.7%).

### **C. SPECIFIC AIM 1**

Analyses of our weighted sample revealed that children whose parents did not reapply for OHP coverage tended to younger than 12 years of age (78.5%), white (78.3%), and non-Hispanic (74.6%). Most of these children were reportedly born in the U.S. (94.5%) and most spoke English as the primary language in the household (82.1%). More than half (55.8%) came from households where the survey respondent (i.e. a parent or guardian) reported an educational attainment of high school or less. Only one-quarter of individuals in this group reported being unemployed at the time of survey administration. Still, many reported an annual household income of less than or equal to \$15,000 per year (40.6%), which

indicates that these families likely fell below the federal poverty line at that time (Table 8).

In general, the demographic characteristics of race, ethnicity, birthplace, and primary language were similar among the different application groups. However, there were several notable differences among the application groups (Table 8). Statistically significant differences were seen with respect to proportions of children older than 12 years old ( $p=0.0039$ ) and less than 2 years old ( $p=0.0070$ ). Additionally, differences were seen with respect to the percentages of parents or guardians reporting unemployment ( $p=0.0006$ ), parents reporting an educational attainment of high school or less ( $p=0.0131$ ), and those with household incomes of \$15,000 or less ( $p=0.0006$ ). Differences were also seen between the application groups with regard to the reporting of one or more factors for socio-economic instability ( $p=0.0007$ ).

The weighted row percentages and bivariate comparisons assist in the further characterization of these global differences (Tables 8 & Appendix A, Table 27). Compared with children who were accepted into OHP during this reapplication cycle, children whose parents did not reapply to renew their OHP coverage were more likely to be younger than 12 years of age ( $p=0.0047$ ). They were also more likely to be younger than 2 years of age ( $p=0.0070$ ). Furthermore, compared with those who were accepted into the program, children whose parents did not reapply for OHP were less likely to come from households with one or more risk factors for socio-economic instability, ( $p=0.0008$ ). In addition, they were more likely to come

from households with higher parental educational attainment than children in the other application groups (Appendix A, Table 27).

**Table 8. Comparisons of Demographic Characteristics According to Application Status (Weighted Percentages)**

Demographic Characteristics		Accepted (n=97)	Denied (n=112)	Did Not Reapply (n=183)	Design Based F-Test p-value
<b>Gender</b>					0.4311
	Male	50.0%	50.9%	57.6%	
	Female	50.0%	49.1%	42.4%	
<b>Age</b>					0.0039*
	< 12 Years	59.9%	74.1%	78.5%	
	≥ 12 Years	40.1%	25.9%	21.5%	
<b>Infant</b>					0.0070*
	> 2 Years	91.1%	83.6%	75.0%	
	≤ 2 Years	8.9%	16.4%	25.0%	
<b>Race</b>					0.5181
	White	74.3%	65.6%	78.3%	
	Non-white	25.7%	34.4%	21.7%	
<b>Ethnicity</b>					0.4572
	Non-Hispanic	68.8%	66.2%	74.6%	
	Hispanic	31.2%	33.8%	25.4%	
<b>Race/Ethnicity</b>					0.2211
	White, Non-Hispanic	58.4%	57.4%	68.4%	
	Non-White or Hispanic	41.6%	42.6%	31.7%	
<b>U.S. Born</b>					0.6262
	Yes	93.1%	96.8%	94.5%	
	No	6.9%	3.2%	6.5%	
<b>Language</b>					0.5775
	English	85.2%	79.0%	82.1%	
	Spanish	14.8%	21.0%	17.9%	
<b>Parental Education</b>					0.0131*
	≤ High School	74.4%	70.7%	55.8%	
	> High School	25.6%	29.3%	44.2%	
<b>Parental Employment</b>					0.0006*
	Employed	50.1%	52.1%	73.3%	
	Unemployed	49.9%	47.9%	26.7%	
<b>Household Income</b>					0.0006*
	≤\$15,000	67.4%	55.8%	40.9%	
	>\$15,000	32.6%	44.2%	59.1%	
<b>Socio-Economic Instability</b>					0.0007*
	Yes	76.6%	68.9%	51.3%	
	No	23.4%	31.1%	48.7%	
<b>Child has a Chronic Disease</b>					0.4555
	Yes	24.3%	36.5%	19.7%	
	No	75.7%	63.5%	80.3%	

\*p<0.05; \*\*p<0.10

## B. SPECIFIC AIM 2

Out of 392 survey respondents, 340 (87.2%) reported that their child needed medical, prescription, or dental care during the 6-month study period. The majority reported that their child needed medical care (Table 9). More than half reported that their child needed either dental care or prescription medications during the study period (Table 9). Almost one quarter of respondents who reported that their child needed care also reported that their child went without needed medical care and nearly one half reported that their child went without needed dental care (Table 9).

**Table 9. Prevalence of Healthcare Needs (Unweighted Data)**

Healthcare Need	Percentage of Respondents with Healthcare Need (n)	Percentage of Respondents with Unmet Need (n)
Medical Care	71.5% (276)	22.6% (61)
Dental Care	57.7% (221)	42.2% (92)
Prescription Care	55.2% (213)	17.8% (37)

There were significant differences among application groups with regards to the reporting of unmet healthcare needs (Table 10,  $p=0.0026$ ). Children whose parents did not reapply for their OHP coverage were far more likely than those who were accepted into the program to report an unmet healthcare need (Table 13,  $p=0.0030$ ). Furthermore, these children were more likely than those who were denied coverage to report an unmet need, although this result was not statistically significant (Table 13,  $p=0.3513$ ). With regard to specific types of unmet need, children whose parents did not reapply for OHP coverage were more likely to experience an unmet medical or dental need than those who were accepted into the program ( $p=0.0148$  and  $0.0005$ , respectively). No differences were seen with

respect to unmet prescription needs (Table 13). We had anticipated that significant differences would exist between those whose parents did not reapply for OHP and those who were accepted into the program with respect to unmet need. However, we expected that those who were denied coverage would report similar levels of unmet need given that they too were vulnerable to significant coverage gaps.

**Table 10. Associations between Application Status & Unmet Healthcare Needs (Weighted Percentages)**

Unmet Healthcare Need		Accepted (n=97)	Denied (n=112)	Did Not Reapply (n=183)	Design Based F- Test p-value
<b>Any Unmet Need</b>					0.0026*
	Yes	23.7%	36.1%	46.9%	
	No	76.3%	63.9%	53.1%	
<b>Medical Care</b>					0.0153*
	Yes	11.4%	16.4%	29.4%	
	No	88.6%	83.6%	70.6%	
<b>Dental Care</b>					0.0003*
	Yes	19.4%	44.1%	54.7%	
	No	80.6%	55.9%	45.3%	
<b>Prescription Care</b>					0.4334
	Yes	15.0%	14.5%	22.7 %	
	No	85.0%	85.5%	77.3%	

\* p<0.05 ; \*\*p<0.25

Contingency tables were also utilized to examine the relationship between application status and a variety of outcomes related to insurance status, financial burden and healthcare utilization. Not surprisingly, there was a strong association between application status and whether or not the child was insured at the end of the study period (Table 11, p<0.001). Children who were accepted into OHP were more likely than those in the other application groups to have insurance at the end of the six-month study period. However, more than seven percent still reported being uninsured at the time of survey administration (Table 11). These individuals may have “churned” off OHP during the prior six months and encountered their

reapplication window shortly before they received the survey at which time they either failed to reapply or were denied coverage. Another possibility is that these individuals were misclassified based on parental response. A recent study demonstrated that approximately 13% of parents were uncertain about their child's insurance status.<sup>46</sup> More interesting perhaps is the fact that children whose parents did not reapply for OHP were even less likely to have insurance at the end of the study period than those who were denied coverage (Table 13,  $p < 0.001$ ). Furthermore, they were less likely to be continuously insured throughout the study period than those who were denied coverage (Table 13,  $p = 0.0086$ ).

There were other notable differences among the application groups (Table 11). Parents who did not apply to renew their child's OHP coverage reported that they had fewer medical visits in the last six months (Table 13,  $p = 0.0633$ ) despite a reportedly high level of medical need. These respondents were also more likely to report that their child's health was fair or poor as compared with those who were accepted into the program (Table 13,  $p = 0.0781$ ) and those that applied but were denied coverage (Table 13,  $p = 0.0020$ ). Additionally, parents who did not reenroll their child in OHP were more likely to report significant medical debt than either those who were accepted into the program or those who were denied coverage (Table 13,  $p < 0.001$  and  $0.0407$ , respectively). Finally, despite clear differences in other access indicators, there were no significant differences among the groups with regard to having a usual source of care (Table 13,  $p = 0.4189$ ). Unadjusted odds ratios for associations between application status and various outcomes are presented as well (Appendix A, Table 28).



**Table 11. Associations between Application Status, Healthcare Utilization and Insurance Status (Weighted Percentages)**

Healthcare Utilization	Accepted (n=97)	Denied (n=112)	Did Not Reapply (n=183)	Design Based F-Test p-value
<b>Continuous Insurance</b>				<0.001*
Continuous	86.7%	68.8%	43.5%	
Not Continuous	13.3%	31.2%	56.5%	
<b>Current Insurance Status</b>				<0.001*
Insured	92.4%	88.6%	62.0%	
Uninsured	7.6%	11.4%	38.0%	
<b>Difficulty with Medical Bills</b>				<0.001*
Yes	6.4%	23.2%	29.2%	
No	93.6%	76.8%	70.8%	
<b>Current Medical Debt</b>				<0.001*
Yes	12.1%	27.3%	46.4%	
No	87.9%	72.7%	53.6%	
<b>Recent Medical Visit</b>				0.0633**
Yes	82.9%	83.0%	71.0%	
No	17.1%	17.0%	29.0%	
<b>Recent ED Visit</b>				0.1306**
Yes	16.5%	33.4%	25.7%	
No	83.5%	66.6%	74.3%	
<b>Usual Source of Care</b>				0.4189
Yes	89.9%	89.6%	86.0%	
No	10.1%	10.4%	14.0%	

\* p<0.05; \*\*p<0.25

**Table 12. Associations between Application Status & Health Indicators (Weighted Percentages)**

Health Indicator	Accepted (n=97)	Denied (n=112)	Did Not Reapply (n=183)	Design Based F-Test p-value
<b>Child's Health</b>				0.0538**
Poor-Fair	54.9%	37.5%	68.1%	
Good-Excellent	45.1%	62.5%	31.9%	
<b>Health Change</b>				0.2424**
Same-Better	99.0%	96.4%	96.5%	
Worse	1.0%	3.6%	3.5%	
<b>Health Interference</b>				0.2756
Yes	41.6%	57.3%	34.9%	
No	58.4%	42.7%	65.1%	

\* p<0.05 ; \*\*p<0.25

**Table 13. Comparisons of Unmet Needs and Other Outcomes among Application Groups (Weighted Percentages)**

	<b>Did Not Reapply (n=183) vs. Applied &amp; Accepted (n=97)</b>	<b>Did Not Reapply (n=183) vs. Applied &amp; Denied (n=112)</b>
<b>Outcome of Interest</b>	<b>Design Based F-Test p-value</b>	<b>Design Based F-Test p-value</b>
<b>Any Unmet Need</b>	0.0030*	0.3513
<b>Unmet Medical Need</b>	0.0148*	0.1769
<b>Unmet Dental Need</b>	0.0005*	0.3649
<b>Continuous Insurance</b>	<0.001*	0.0086*
<b>Current Insurance</b>	<0.001*	<0.001*
<b>Difficulty with Medical Bills</b>	<0.001*	0.4391
<b>Current Medical Debt</b>	<0.001*	0.0407*
<b>Recent Medical Visit</b>	0.0584**	0.0870**
<b>Recent ED Visit</b>	0.1310	0.5490
<b>Child's Health</b>	0.0781**	0.0020*
<b>Health Change</b>	0.2339	0.9459

\* p<0.05; \*\*p<0.10

Contingency tables were also constructed to identify whether or not any of the available demographic characteristics could be potential confounders of the relationship between application status and having an unmet healthcare need (Table 14). Children two years old or younger were reported to have more unmet healthcare needs than older children (p=0.0327). Those who were white and non-Hispanic were more likely to report an unmet healthcare need (p=0.0978). Parents with an educational attainment beyond high school were more likely to report that their child had an unmet healthcare need (p=0.0363). Furthermore, those with at least one risk factor for socioeconomic instability were more likely to report that their child had an unmet healthcare need (p=0.0895). Finally, children with a chronic disease were more likely to have unmet healthcare needs (p=0.1733). As a result of this initial analysis, our preliminary main effects model included the

variables for age, race-ethnicity, chronic disease, parental education, and the aggregate variable for socio-economic stability. Each of these variables was both theoretically relevant and also achieved a statistical significance level of  $p < 0.25$ .

In addition to the aforementioned demographic variables, respondents whose children were uninsured at the time of survey administration were far more likely to report that they had an unmet healthcare need than those who were insured (Table 15,  $p < 0.001$ ). Also, respondents whose children experienced gaps in their insurance coverage (1 month or greater) throughout the study period were more likely to report that they had an unmet healthcare need than those who were continuously covered ( $p < 0.001$ ). These strong associations indicate that current insurance status as well as the presence or absence of continuous coverage could function as either mediators or confounders of the relationship between application status and unmet need. Therefore, the potential consequences of their inclusion in the model were assessed. The specific model-building procedure is described in Appendix A (Table 29).

**Table 14. Associations between Unmet Healthcare Needs and Demographic Characteristics (Weighted Percentages)**

Demographic Characteristics	No Unmet Need	Unmet Need	Design Based F-Test p-value
<b>Gender</b>			0.4734
Male	74.3%	25.7%	
Female	68.6%	31.4%	
<b>Age</b>			0.3348
< 12 Years	74.3%	25.7%	
≥ 12 Years	66.4%	33.6%	
<b>Infant</b>			0.0327*
> 2 Years	74.2%	25.8%	
≤ 2 Years	46.7%	53.3%	
<b>Race</b>			0.3281
White	69.3%	30.7%	
Non-white	79.2%	20.8%	
<b>Ethnicity</b>			0.3092
Non-Hispanic	67.7%	32.3%	
Hispanic	77.3%	22.7%	
<b>Combined Race/Ethnicity</b>			0.0978**
White, Non-Hispanic	65.1%	34.9%	
Non-White or Hispanic	79.5%	20.5%	
<b>U.S. Born</b>			0.2951
Yes	70.9%	29.1%	
No	86.6%	13.4%	
<b>Language</b>			0.4546
English	70.4%	29.6%	
Spanish	78.4%	21.6%	
<b>Parental Education</b>			0.0363*
≤ High School	77.4%	22.6%	
> High School	59.6%	40.4%	
<b>Parental Employment</b>			0.2966
Employed	76.3%	23.7%	
Unemployed	68.0%	32.0%	
<b>Household Income</b>			0.2126*
≤\$15,000	74.4%	25.6%	
>\$15,000	64.2%	35.8%	
<b>Socio-Economic Instability</b>			0.0895**
Unstable	60.0%	40.0%	
Stable	75.0%	25.0%	
<b>Chronic Disease</b>			0.1733*
Yes	62.0%	38.0%	
No	74.8%	25.2%	

\*p<0.05, \*\*p<0.25

**Table 15. Associations between Unmet Healthcare Needs and Insurance Status (Weighted Row Percentages)**

<b>Outcome</b>		<b>No Unmet Need</b>	<b>Unmet Need</b>	<b>Design Based F-Test p-value</b>
<b>Continuous Insurance</b>				<0.001*
	Continuous	80.1%	19.9%	
	Not Continuous	32.0%	68.0%	
<b>Current Insurance Status</b>				<0.001*
	Insured	77.3%	22.7%	
	Uninsured	29.2%	70.8%	

\*p<0.05, \*\*p<0.25

Ultimately, our preliminary model included the categorical variable for age as well as application status. The variables for age trended towards but did not achieve statistical significance (Table 16). However, given that these variables significantly impacted the regression coefficients for application status when they were included in the model, they were felt to represent potentially important confounders and were included in our final main effects model. Also, their inclusion improved the overall fit of this model (F-adjusted mean residual p-value=0.847).

After adjusting for age, children whose parents did not reapply to renew their OHP coverage had almost three times the odds of having an unmet healthcare need as compared with those who were accepted into the program (OR: 2.8, 95% CI: 1.3-6.1). Additionally, they had higher odds of having an unmet healthcare need compared with those who reapplied to OHP but were denied coverage (OR: 1.6, 95% CI: 0.7-3.8) although this difference was not statistically significant (Table 16).

**Table 16. Potential Models for Specific Aim 2: Association between Application Status and Unmet Need (Adjusted Odds Ratios & 95% CIs)**

<b>Independent Variable</b>	<b>Preliminary Model</b>	<b>Preliminary Model + Current Insurance</b>	<b>Preliminary Model + Continuous Insurance</b>	<b>Preliminary Model + Both</b>
<b>Application Status</b> Accepted Denied Did Not Reapply	1.0 1.8 (0.7-4.4) 2.8 (1.3-6.1)*	1.0 1.6 (0.6-4.2) 1.6 (0.7-3.6)	1.0 1.2 (0.4-3.5) 1.0 (0.4-2.7)	1.0 1.2 (0.4-3.7) 0.9 (0.4-2.3)
<b>Age</b> >2 to <12 years old ≤ 2 years old ≥ 12 years old	1.0 3.5 (0.9-13.4)** 2.2 (1.0-5.2)**	1.0 2.7 (0.6-12.0) 1.9 (0.8-4.4)	1.0 2.8 (0.6-12.5) 2.4 (1.0-6.2)**	1.0 2.7 (0.6-12.3) 2.2 (0.9-5.7)
<b>Current Insurance</b> Insured Uninsured		1.0 5.8 (2.0-16.8)*		1.0 1.5 (0.4-5.7)
<b>Continuous Insurance</b> Continuous Not Continuous			1.0 8.5 (2.9-24.8)*	1.0 6.8 (1.6-29.3)*

\*p<0.05, \*\*p<0.10

After selecting our preliminary model, we examined the impact of adding information about continuous insurance as well as current insurance status to determine whether or not the apparent relationship between application status and unmet healthcare need would still persist. These variables were assessed independently and then included together with the preliminary model (Table 16). After adjusting for application status and age, children who were uninsured at the time of survey administration were much more likely to have an unmet healthcare need than those who were insured (OR: 5.8, 95% CI: 2.0-16.8). Similarly, after adjusting for application status and age, those who reported having any gap in insurance coverage were much likely to have an unmet healthcare need compared

with those who were continuously insured (OR: 8.5, 95% CI: 2.9-24.8). When the variables were added together to the preliminary model, the variable describing current insurance status did not achieve statistical significance. Also, not surprisingly, there was a high degree of collinearity ( $p < 0.001$ ) between current insurance status and continuous insurance and the inclusion of both variables in the model resulted in model instability. The fit of the model was significantly improved with the inclusion of the continuous insurance variable only (F-adjusted mean residual  $p$ -value=0.936). Thus, current insurance status was ultimately excluded from consideration in the final model.

Finally, contingency table analyses of the relationship between continuous insurance and unmet healthcare needs when the data were stratified by application status led to the hypothesis that interaction may be occurring between these variables. Thus, an interaction term for application status and continuous insurance was considered. However, there was not adequate cell size to reliably utilize this interaction term in our model (Appendix A, Table 29). In addition, when the interaction term was included in the model it was not statistically significant. Therefore, no interaction term was included in our final model. The final selected model was tested for goodness of fit using the F-adjusted mean residual test (Table 18). Based on the results of this test, there was no evidence of lack of fit for this model (F-adjusted test statistic=0.205,  $p$ -value=0.936).

**Table 17. Final Model: Likelihood of Unmet Healthcare Needs**

<b>Independent Variable</b>	<b>Adjusted Odds Ratio</b>	<b>95% CI</b>	<b>Wald Test p-value</b>
<b>Application Status</b>			
Applied & Accepted	1.0		
Applied & Denied	1.2	0.4-3.5	0.769
Did Not Reapply	1.0	0.4-2.7	0.959
<b>Continuous Insurance</b>			
Continuous	1.0		
Not Continuous	<b>8.5</b>	<b>2.9-24.8</b>	<b>&lt;0.001*</b>
<b>Age</b>			
>2 to <12 years old	1.0		
≤ 2 years old	2.8 (0.6-12.5)	0.6-12.5	0.182
≥ 12 years old	2.4 (1.0-6.2)**	1.0-6.2	0.062

\*p<0.05, \*\*p<0.10

Initially, there appeared to be an association between application status and the presence of an unmet healthcare needs. After adjusting for age, compared to those who were accepted into the program, the odds of having an unmet healthcare need was almost three times higher for those children whose parents did not reapply for OHP during their anticipated reapplication window (OR: 2.8, 95% CI: 1.3-6.1). Furthermore, they also had a greater tendency towards unmet need than even those who were denied OHP coverage. This difference was not statistically significant but does point to the possibility of an inherent vulnerability in this population that may have previously been unrecognized.

As was discovered with the inclusion of the continuous insurance variable in the model, this vulnerability may come in the form of a greater proclivity towards gaps in insurance coverage. As demonstrated previously, children whose parents did not reapply for OHP were much more likely than those who were denied



coverage to have a gap in their health insurance of one month or greater (Table 13,  $p=0.0086$ ). On average those whose parents did not reapply to renew their coverage were uninsured for longer periods of time than those who were denied coverage (2.4 vs. 1.8 months). The distribution of months uninsured among the different application groups is shown in Figure 4 (Appendix A).

When the variable for continuous coverage was included in the model, it completely attenuated the association between application status and unmet healthcare needs, which suggested that it was acting as a mediator of the relationship of interest. As a result, whether or not the child had continuous coverage was the only statistically significant predictor of unmet healthcare need. After adjusting for application status and age, children with a gap in insurance coverage of one month or greater had significantly higher odds of having an unmet healthcare need than those with continuous coverage (OR: 8.5, 95% CI: 2.9-24.8).

### **C. SPECIFIC AIM 3**

At the end of the six-month study period, approximately two-thirds (62.0%) of children whose parents did not apply to renew their child's OHP coverage had obtained some form of health insurance. One-third (35.8%) of these children were enrolled in a public insurance program and one-quarter (26.2%) was enrolled in a private insurance plan. More than one-third (38.0%) of all children whose parents did not reapply for OHP were uninsured at the end of the six-month study period (Appendix A, Figure 4).

**Table 19. Reasons for OHP Disenrollment\*\***

Reason for Disenrollment	Weighted % (n)
<b>Improved Circumstances</b>	
Income too high	22.3% (35)
Found other insurance	22.8% (35)
<b>Burdensome Process Requirements</b>	
Forgot to reapply	4.2% (10)
Paperwork too much of a hassle	3.2% (7)
Could not find paperwork to prove citizenship	4.3% (9)
Could not find other required paperwork	6.3% (15)
<b>Other*</b>	
Dissatisfied with the program	3.3% (7)
Some other reason	21.0% (39)
Do not know why	3.5% (3)
Did reapply during that time period	9.1% (22)

*\*Individuals with responses in this category were excluded from multivariate logistic regression modeling*

*\*\* Weighted percentages do not sum to 100%*

First, we wanted to elucidate the reasons why parents were not applying to renew their child’s OHP coverage. Approximately twenty percent of respondents claimed that their “Income was too high” to reenroll their child in the program (Table 19). Similar proportions also claimed that they had “found other insurance”. Parents also frequently cited program barriers, such as paperwork to prove citizenship or income, as the principal deterrents to their child’s reenrollment in OHP (13.8%). Finally, almost ten percent (9.1%) of parents who did not apply to renew their child’s OHP coverage believed that they actually had.

Excluding those who stated that they did reapply during this time period, one-quarter of survey respondents (24.5%) in this group gave “Income too high” as their reason for not renewing their child’s OHP coverage. Approximately thirty

percent (28.5%) cited burdensome process requirements as the primary deterrents to OHP reenrollment. Children whose parents cited burdensome process requirements as the principle deterrent to OHP reenrollment were less likely to be insured at the end of the study period than those who disenrolled presumably due to improved circumstances (Table 20, p=0.0039).

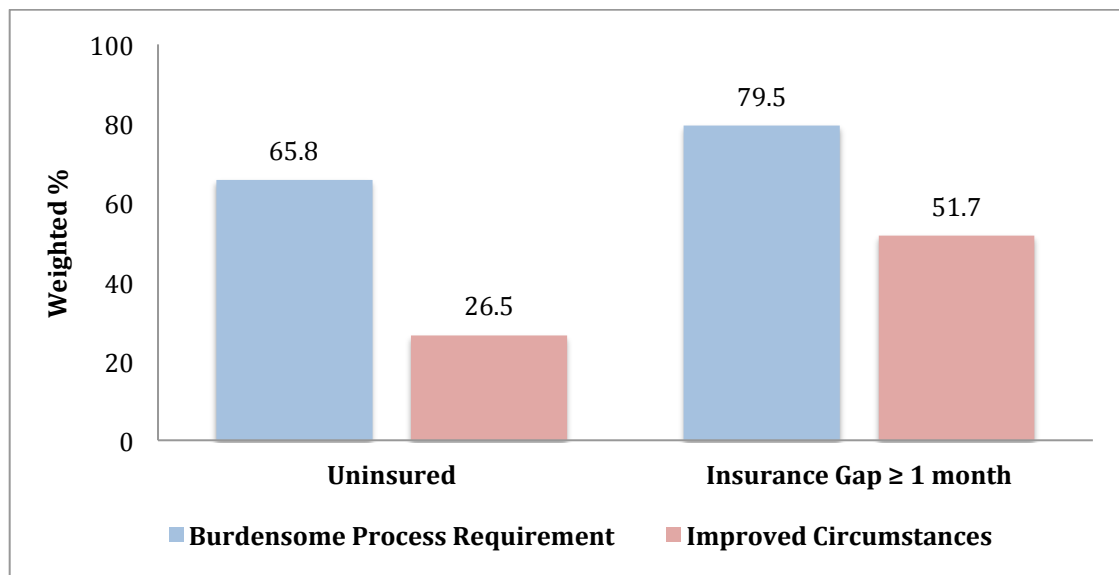
Not surprisingly, children from households with an annual income of \$15,000 or less were more likely to cite burdensome process requirements as opposed to improved circumstances as their reason for OHP disenrollment (p=0.0521; Appendix A, Table 36). However, nearly twenty percent of those who were disenrolled due to improved circumstances fell below the federal poverty limit (19.5%; Appendix A, Table 36). Overall, nearly forty percent of children who remained uninsured at the end of the study period came from households with an annual income of \$15,000 or less (Table 21). This indicates that at least based on income eligibility criteria, many of the uninsured were likely still eligible for the Oregon Health Plan at the time of their disenrollment.

**Table 20. Comparisons of Reasons for OHP Disenrollment According to Insurance Status (Weighted Row Percentages)**

Reason for OHP Disenrollment	Current Insurance		Design Based F-Test p-value
	Insured (n=118)	Uninsured (n=60)	
<b>Income Too High</b>			0.8735
<b>Yes</b>	63.3%	36.7%	
<b>No</b>	60.9%	39.1%	
<b>Burdensome Process Requirements</b>			0.0039*
<b>Yes</b>	34.2%	65.8%	
<b>No</b>	73.5%	26.5%	

\*p<0.05

Only one third of children whose parents did not apply to renew their OHP coverage due to burdensome process requirements were insured by the end of the study period. Furthermore, almost 80% of children who were disenrolled due to burdensome process requirements had a gap in their insurance coverage of one month or greater (Figure 3). In comparison, nearly three-quarters of children who were disenrolled due to improved circumstances had obtained insurance for them by the end of the study period. Approximately half of these children reportedly had an insurance gap of one month or greater as well (Figure 3). The differences between the proportions of those who were currently insured and continuously insured were statistically significant ( $p=0.0039$  and  $0.0214$ , respectively).



**Figure 3. Insurance outcomes according to reason for OHP disenrollment**

Contingency tables were constructed to determine whether any of the available demographic characteristics were associated with a child’s attainment of health insurance by the end of the six-month study period. As shown below in Table 21, among those whose parents did not apply to renew their OHP coverage, several demographic characteristics were associated with the attainment of health

insurance. Children two years old or younger were less likely to be insured at the time of survey administration ( $p=0.1675$ ). Additionally those who were not born in the U.S. and those whose primary language was Spanish were less likely to be insured ( $p=0.2100$  and  $0.2375$ , respectively). Finally, children whose parents were employed were less likely to be insured at the time of survey administration ( $p=0.1385$ ). Due to both their statistical and theoretical significance, these variables were included in our preliminary main effects model. In addition, the dichotomous variable designed to capture a parent's reason for not applying to renew their child's OHP coverage (burdensome process versus improved circumstances) was included in the preliminary main effects model. The selected demographic variables were also strongly associated with an individual's reason for disenrollment, which strengthened the justification for their inclusion in the model (Appendix A, Table 36). Our specific model-building procedure is described in Appendix A (Table 32).

Ultimately, our final main effects model included the following variables: reason for disenrollment (burdensome process versus improved circumstances), age (less than or equal to 2 years old versus greater than 2 years old), and parental employment (employment versus unemployed). Age and parental employment were not statistically significant but their inclusion in the model significantly impacted the regression coefficient for the other statistically significant variables and thus they were felt to represent important confounders. Numerous interaction terms were evaluated in the model but none was found to be statistically significant (Appendix A, Table 33).

Our final model with adjusted odds ratios and 95% confidence intervals is presented in Table 22. Based on an F-adjusted mean residual test, there was no evidence of lack of fit for this model (F-adjusted test statistic=0.320, p-value=0.900). After adjusting for parental employment and age, children who disenrolled from OHP as the result of burdensome process requirements had significantly lower odds of attaining health insurance by the end of the study period (OR: 0.25, 95% CI: 0.09-0.73). Furthermore, although the result was not statistically significant, those whose parents were unemployed were more likely to have obtained insurance by the end of the study period (OR: 2.07, 95% CI: 0.65-6.64). As it turns out, children of parents who were unemployed were more likely to have churned back on to a public insurance program than those who were employed (Appendix A, Table 37).

**Table 21. Comparisons of Demographic Characteristics According to Insurance Status (Weighted Row Percentages)**

Demographic Characteristics	Current Insurance		Design Based F-Test p-value
	No	Yes	
<b>Gender</b>			0.6617
	Male	36.0%	64.0%
	Female	40.8%	59.2%
<b>Age</b>			0.2548
	< 12 Years	35.4%	64.6%
	≥ 12 Years	49.1%	50.9%
<b>Infant</b>			0.1675**
	> 2 Years	33.9%	66.1%
	≤ 2 Years	50.2%	49.8%
<b>Race</b>			0.7071
	White	37.1%	62.9%
	Non-white	41.6%	58.4%
<b>Ethnicity</b>			0.9968
	Non-Hispanic	38.2%	61.8%
	Hispanic	38.2%	61.8%
<b>Race/Ethnicity</b>			0.4292
	White, Non-Hispanic	35.6%	64.4%
	Non-White or Hispanic	44.1%	55.9%
<b>U.S. Born</b>			0.2100**
	Yes	36.3%	62.7%
	No	54.5%	45.5%
<b>Language</b>			0.2375**
	English	35.8%	64.2%
	Spanish	48.8%	51.2%
<b>Parental Education</b>			0.6467
	≤ High School	35.7%	64.3%
	> High School	40.9%	67.1%
<b>Parental Employment</b>			0.1385**
	Employed	48.5%	51.5%
	Unemployed	32.9%	67.1%
<b>Household Income</b>			0.8314
	≤\$15,000	39.5%	60.5%
	>\$15,000	37.1%	62.9%
<b>Socio-Economic Instability</b>			0.6479
	Yes	34.1%	65.9%
	No	39.4%	60.6%
<b>Chronic Disease</b>			0.8581
	Yes	40.2%	59.8%
	No	37.5%	62.5%

\*p<0.05; \*\*p<0.25

**Table 22. Final Multivariate Logistic Regression Model: Predictors for the Attainment of Health Insurance (Adjusted Odds Ratios & 95% CIs)**

Predictor Variable	Odds Ratio	95% CI	Wald Test p-value
<b>Reason for Disenrollment</b>			
Improved Circumstances	1.0		
Burdensome Process Requirements	0.25	0.09-0.73	0.012*
<b>Age</b>			
>2 years old	1.0		
≤ 2 Years old	1.43	0.42-4.86	0.563
<b>Parental Employment</b>			
Employed	1.0		
Unemployed	2.07	0.65-6.64	0.217

\*p<0.05, \*\*p<0.10

## **V. DISCUSSION**

Three hundred and ninety two children were included in this secondary data analysis and this number was weighted back to a population of approximately 114,000. This analysis reveals that the vast majority of children who were new applicants or re-applicants to the Oregon Health Plan during the OHP Disenrollment Study’s sampling window were accepted into the program. Nevertheless, challenges to successful reenrollment exist for many families.

The first aim of this study was to identify potential predictors of disenrollment and to understand whether or not demographic differences existed between those who did and those who did not apply to renew OHP coverage. In general, the demographic characteristics among the application groups were quite similar although some interesting exceptions did emerge. Most notably, children whose parents did not apply to renew their coverage tended to report higher educational attainment than those in the other application groups. Also, these



children were less likely to come from households with one or more risk factors for socio-economic instability (i.e. poverty or unemployment). Individuals with more socioeconomic stability may have perceived that their children would not qualify due to their employment status or income. Unfortunately, in many cases, this perception may have been incorrect given that among those who did not reapply to renew their child's coverage, more than forty percent were living in poverty at the time of survey. Finally, there were no differences among the application groups with respect to the proportions of parents or guardians who reported that their child had a chronic disease, such as asthma or diabetes. We might expect that those children whose parents did not renew their OHP coverage would be less likely to have a chronic condition necessitating frequent medical visits. However, in this particular population, we did not observe this trend. Furthermore, as opposed to what has been observed in prior studies,<sup>4</sup> higher proportions of children whose parents did not reapply to renew their coverage were younger than 12 years old and younger than 2 years old compared with those in other application groups.

With regard to the impacts of disenrollment on children on access to healthcare and healthcare utilization, we identified numerous important differences among the application groups. First, parents who did not reapply to renew their child's OHP coverage were more likely than those in the other application groups to report that their child had poor or fair health. However, they had fewer medical and ED visits than those in the other application groups. These observations indicate that these individuals were unlikely to seek either emergent or scheduled care despite the fact that their child's health status would suggest higher overall need.

Furthermore, parents who did not apply to renew their child's coverage were more likely to report a significant financial burden related to medical debt than their counterparts in either comparison group. Thus, while they may have enjoyed less unemployment or poverty, they were likely not financially stable enough to obtain or sustain another type of insurance.

Overall, parents who did not reenroll their child in OHP were more likely than those in the other application groups to report that their child had an unmet healthcare need. In particular, they were more likely to experience unmet medical or dental needs. No differences were seen with respect to unmet prescription needs. It was anticipated that significant differences would exist between those whose parents did not reapply for OHP and those who were accepted into the program with respect to unmet need. However, it was expected that those who were denied coverage would report similar levels of unmet need, as they too were vulnerable to significant coverage gaps.

Ultimately, the association between OHP disenrollment and the presence of an unmet healthcare needs was explained by the fact that these children were more likely to have gaps in insurance coverage than children in either comparison group. In other words, the presence or absence of continuous insurance coverage functioned as a mediator of this relationship. Furthermore, not only were children whose parents did not reapply to renew their coverage more likely to have a gap of one month or greater, their gaps in coverage were longer on average than those who denied coverage. Prior literature has demonstrated that increasing lengths of coverage gaps are associated increasing odds of unmet needs.<sup>14</sup> This study again

confirms these findings about the importance of continuous coverage. Those with a one-month or greater gap in coverage had more than eight times the odds of having an unmet need compared to those with continuous coverage. The magnitude of this association is even larger than what has previously been reported and reinforces the fact that every effort should be made to minimize barriers to continuous coverage for children.

Another important component of this study was attempting to understand the drivers of disenrollment in this group of previously Medicaid eligible children and the eventual insurance outcomes of those who leave OHP. Ideally, all children who leave the program would do so as a result of improved circumstances and would ultimately obtain insurance with minimal interruptions in coverage. In this study population, nearly forty percent of all children whose parents did not apply to renew their coverage were uninsured at the end of the six-month study period. This outcome was even worse for those who left due to burdensome process requirements, with nearly two-thirds remaining uninsured. Even among those who left due to improved circumstances, nearly one-quarter remained uninsured. Additionally, twenty percent of those who did not reapply due to improved circumstances were living in poverty and thus their children may have actually qualified for the Oregon Health Plan. These results indicate that many parents are not leaving the program based on their own discretion. Those who experience the aforementioned financial and structural barriers to OHP reapplication are often unable to obtain insurance coverage for their children elsewhere.

## VI. HEALTH POLICY IMPLICATIONS

Since 2007 when this survey data was collected, numerous policies have been implemented which are designed to expand health insurance coverage options for children. With the reauthorization of CHIP in 2009, states were given new funding to sustain and expand existing coverage and to reach more uninsured children.<sup>47</sup> Despite the economic challenges many states are experiencing, many are holding steady in their coverage levels.<sup>47</sup> Oregon has taken many steps to ease the burden of application and reapplication in addition to the creation of a three tier insurance program under the Healthy Kids Initiative. These include: instituting a policy of 12 months of continuous eligibility, mandating a shorter uninsured waiting period (2 months) prior to initial application, and creating an online application form.<sup>48</sup> Currently, the uninsured rate for children is 9.8%, one of the lowest in the past two decades.<sup>47</sup> However, among those who remain uninsured, 65% are eligible for coverage under current Medicaid and CHIP rules but not enrolled.<sup>49</sup>

Nationally, the changes mandated in the Affordable Care Act (ACA) will expand Medicaid coverage to all individuals below 138% of the FPL. In addition, for eligible individuals below 400% of the FPL, the federal government will provide a tax credit to support the purchase of an insurance plan through an exchange.<sup>47</sup> Congress chose to require states to maintain their existing Medicaid and CHIP eligibility through 2019 through a “maintenance of efforts” clause. Although not guaranteed, if these current eligibility levels for Medicaid and CHIP are maintained, it is anticipated that changes under the ACA will extend coverage to an additional three to four million children.<sup>50, 23, 24, 47</sup> A recent simulation study estimated that

among the four million children who will remain uninsured, more than half would be eligible for Medicaid or CHIP but not enrolled; fifteen percent would be ineligible due to immigration status; and the remaining would be in families expected to enroll in employer-based or exchange coverage plans.<sup>47</sup>

These numbers suggest that coverage will be improved but still not guaranteed as a result of current health care reforms, provided that they are implemented as currently outlined. In lieu of a true, nationwide commitment to providing universal coverage for all children, health policy makers must continue to find ways to reduce the burden of application and reapplication to public insurance programs. In Oregon, many positive steps have been taken, but a recent evaluation of the Healthy Kids program suggests that parents are still confronting many of the same barriers faced by participants in this study in spite of the streamlined processes.<sup>51</sup> Further simplification of the application, institution of passive re-enrollment, and elimination of the 2-month waiting period are just a few measures that could be taken to reduce the possibility that eligible children will remain uninsured and suffer untoward health effects as a result. As was demonstrated in our results, shorter gaps in coverage make a difference and greatly increase a child's odds of experiencing unmet healthcare needs. As a result, measures aimed at ensuring continuous coverage for all children will ultimately result in considerable financial and societal benefits.

## **VII. LIMITATIONS**

Despite the strength of the associations presented here, interpreting these data requires the consideration of several important factors. First, this survey was

conducted in Oregon among English and Spanish speakers only. Therefore, the results of this study may not be generalizable to other states with different application requirements. It also fails to capture data from non-Spanish speaking immigrants. In addition, this study was conducted in 2007 prior to many of the recent legislative attempts designed to expand coverage and improve enrollment processes. Nevertheless, many of the barriers faced by families in this study are still in existence today.<sup>51</sup> Thus, the results of this study should be interpreted in this context in order to more successfully inform future efforts to improve enrollment and retention in public insurance programs.

Given that this is survey data, the potential for recall bias exists. However, the questions utilized in this survey were similar to those used previously in a number of well-validated surveys.<sup>7, 39</sup> Also, parents or guardians were only asked to recall the preceding six months rather, as opposed to a longer time period, in order to minimize recall bias. The principal outcome variables used in this analysis were based on self-report and are thus subject to bias as well. It is unknown whether or not individuals who claimed to have unmet need actually did. Similarly, some individuals with unmet needs may not have reported them. Therefore, the effects of any misclassification would most likely be non-differential and bias any results towards the null.

In addition, as this was a mail response survey, there are several important considerations to take into account. First, the use of mail survey leads to the selection of a more stable population than the general Medicaid or low-income population in Oregon. Furthermore, 18% of selected individuals were without valid

addresses. These numbers were approximately equal in all application groups but overall these families may have been more financially unstable and may have had more difficulty accessing needed care regardless of their insurance status.<sup>39</sup> Also, those who successfully returned the mail survey were different in some respects from those who either could not or chose not to navigate this task. Importantly, the percentages of those with a valid address who responded to the survey were approximately equal among our study groups. If larger proportions of individuals who did not apply to renew their child's coverage had failed to respond to the survey, it would have further underestimated the effects seen in this study.

Overall, the response rate in the OHP Disenrollment Study was slightly lower than what has been previously seen in other studies of the Oregon Medicaid population.<sup>7</sup> However, the use of non-response survey weights is a strength of this study and mitigates some of the potential for non-response bias that inherently exists in studies with low survey response rates. Administrative data was available to calculate the non-response survey weight and ensures that the demographic features of the responders and non-responders were approximately equal. There was no information available for non-responders with respect to insurance status or unmet need. It would be anticipated though that non-responders were more likely to be uninsured and to have more unmet need than those who had responded. Thus, their exclusion likely underestimates the strength of the associations seen in this secondary analysis.

## VII. CONCLUSIONS & FUTURE RESEARCH

Despite these limitations, the results of this study provide further insight into the drivers and impacts of disenrollment from public health insurance programs. In this study, many individuals left OHP due to burdensome process requirements and among those who left for these reasons, few were able to find other forms of insurance for their child. Furthermore, children whose parents did not reapply to renew their OHP coverage typically experienced a gap in their insurance coverage. Gaps in insurance coverage, even short ones, were strongly associated with unmet healthcare needs.

Clearly, the results of this study indicate that those who disenroll from OHP are vulnerable to negative health outcomes. In many cases, their departure represents a program failure rather than an improvement in their circumstances. Moving forward it will be imperative to reevaluate programs as they continue to revise their enrollment and reenrollment processes. This process is already in motion with the recent Healthy Kids evaluation.<sup>51</sup> However, gathering survey data and utilizing multivariate analytic methods will be essential to expanding upon information gathered from focus groups. Additionally, another study with a longer follow up period could potentially allow us to determine if and when children who left the program actually obtained insurance again.

Finally, the OHP Disenrollment Study obtained information from adults. The data on adults has been described elsewhere but not yet analyzed with multivariate regression analysis techniques. Therefore, in many respects, it is currently



unknown how their outcomes compare with those of the children in this study. The effects of uninsurance can be devastating at any age and thus their experience certainly merits attention in the near future.

## REFERENCES

1. Sommers BD. Enrolling eligible children in Medicaid and CHIP: A research update. *Health Aff (Millwood)*. 2010;29(7):1350-1355.
2. DeVoe JE, Krois L, Edlund C, Smith J, Carlson NE. Uninsured but eligible children: Are their parents insured? Recent findings from Oregon. *Med Care*. 2008;46(1):3-8.
3. Kempe A, Beaty BL, Crane LA, et al. Disenrollment from a state child health insurance plan: Are families jumping S(c)HIP? *Ambul Pediatr*. 2004;4(2):154-161.
4. Sommers BD. Why millions of children eligible for Medicaid and SCHIP are uninsured: Poor retention versus poor take-up. *Health Aff*. 2007;26(5):w560-w567. Available from: <http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=34485080&site=ehost-live>.
5. Yu J, Harman JS, Hall AG, Duncan RP. Impact of Medicaid/SCHIP disenrollment on health care utilization and expenditures among children: A longitudinal analysis. *Med Care Res Rev*. 2010.
6. Newacheck PW, Stoddard JJ, Hughes DC, Pearl M. Health insurance and access to primary care for children. *N Engl J Med*. 1998;338(8):513-519.
7. Lewitt E, Bennett C, Behrman R. Health insurance for children: Analysis and recommendations. *Future Child*. 2003;13(5):29.
8. Selden TM, Hudson JL. Access to care and utilization among children: Estimating the effects of public and private coverage. *Med Care*. 2006;44(5 Suppl):I19-26.
9. Sommers BD. From medicaid to uninsured: Drop-out among children in public insurance programs. *Health Serv Res*. 2005;40(1):59-78.
10. Andrulis DP, Bauer TA, Hopkins S. Strategies to increase enrollment in children's health insurance programs: A report of the New York academy of medicine. *J Urban Health*. 1999;76(2):247-279.
11. Vivier PM. The impact of Medicaid on children's healthcare and health. *Curr Opin Pediatr*. 2005;17(6):759-763.
12. Carlson MJ, DeVoe J, Wright BJ. Short-term impacts of coverage loss in a Medicaid population: Early results from a prospective cohort study of the Oregon health plan. *Ann Fam Med*. 2006;4(5):391-398.

13. Stevens GD, Seid M, Halfon N. Enrolling vulnerable, uninsured but eligible children in public health insurance: Association with health status and primary care access. *Pediatrics*. 2006;117(4):e751-759.
14. Cummings JR, Lavarreda SA, Rice T, Brown ER. The effects of varying periods of uninsurance on children's access to health care. *Pediatrics*. 2009;123(3):e411-8.
15. CDC. Fast stats: Health insurance coverage. <http://www.cdc.gov/nchs/fastats/hinsure.htm>. Accessed March 4, 2012.
16. Overview of the uninsured in the United States: A summary of the 2011 current population survey. <http://aspe.hhs.gov/health/reports/2011/CPSHealthIns2011/ib.shtml>. Accessed March 1, 2012.
17. Profile of America's uninsured children, 2010. <http://www.childrensdefense.org/child-research-data-publications/data/data-uninsured-children-by-state-2010.pdf>. Accessed March 4, 2012.
18. Satchell M, Pati S. Insurance gaps among vulnerable children in the United States, 1999-2001. *Pediatrics*. 2005;116(5):1155-1161.
19. DeVoe JE, Graham A, Krois L, Smith J, Fairbrother GL. "Mind the gap" in children's health insurance coverage: Does the length of a child's coverage gap matter? *Ambul Pediatr*. 2008;8(2):129-134.
20. 2011 Oregon health insurance survey: Initial results. [www.oregon.gov/OHA/.../Uninsured/2011\\_OHIS\\_Initial\\_Results.pdf](http://www.oregon.gov/OHA/.../Uninsured/2011_OHIS_Initial_Results.pdf). Accessed March 4, 2012.
21. Oregon healthy kids. <http://www.oregon.gov/DHS/healthykids/>. Accessed November 10, 2010.
22. Meurer Jea. American academy of pediatrics: Medicaid policy statement. *Pediatrics*. 2005;116:274.
23. Davis MM. Medicaid, underinsurance, and the dawn of an era for children's coverage. *Pediatrics*. 2010;125(4):817-819.
24. Kaiser Family Foundation. Medicaid enrollment: December 2010 snapshot. <http://www.kff.org/medicaid/upload/8050-04.pdf>. Accessed March 4, 2012.
25. Children's health insurance program reauthorization act of 2009. Washington, D.C.: Kaiser Commission on Medicaid and the Uninsured; 2009 Accessed November 10, 2010.

26. Holahan J, Headen I. Medicaid coverage and spending in health reform: National and state-by-state results for adults at or below 133% FPL. Washington, DC: Kaiser Family Foundation; 2010.
27. Kenney GM, Lynch V, Haley J, Huntress M, Resnick D, Coyer C. Gains for children: Increased participation in medicaid and CHIP in 2009. <http://www.rwjf.org/files/research/20110816coveragegainsforkidsfull.pdf>. Accessed March 1st, 2012.
28. Brown K, Blackmer G. Oregon health authority: Improve controls over child enrollment reporting and advertising expenditures. 2011;2011-19.
29. Kempe A, Beaty BL, Crane LA, et al. Disenrollment from a state child health insurance plan: Are families jumping S(c)HIP? *Ambul Pediatr*. 2004;4(2):154-161.
30. Mitchell JB, Haber SG, Hoover S. What happens to children who lose public health insurance coverage? *Med Care Res Rev*. 2006;63(5):623-635.
31. Shenkman EA, Vogel B, Boyett JM, Naff R. Disenrollment and re-enrollment patterns in a SCHIP. *Health Care Financ Rev*. 2002;23(3):47-63.
32. Cunningham PJ. Medicaid/SCHIP cuts and hospital emergency department use. *Health Aff (Millwood)*. 2006;25(1):237-247.
33. Sommers BD. Enrolling eligible children in Medicaid and CHIP: A research update. *Health Aff (Millwood)*. 2010;29(7):1350-1355.
34. Davidoff AJ, Garrett B. Determinants of public and private insurance enrollment among Medicaid-eligible children. *Med Care*. 2001;39(6):523-535.
35. Sommers BD. The impact of program structure on children's disenrollment from Medicaid and SCHIP. *Health Aff (Millwood)*. 2005;24(6):1611-1618.
36. Ku L, Lin M, Broaddus M. Improving children's health: A chart book about the roles of Medicaid and SCHIP. Washington, D.C.: Center on Budget and Policy Priorities; 2007 Accessed November 10, 2010.
37. Irvin C, Peikes D, Trenholm C, Khan N. Discontinuous coverage in Medicaid and the implications for 12-month continuous coverage for children. Cambridge, MA: Mathematica Policy Research, Inc; 2001.
38. Berman S. Universal coverage for children: Alternatives, key issues, and political opportunities. *Health Aff (Millwood)*. 2007;26(2):394-404.
39. Wright BW, Holmgren A, Rustvold L, Carlson MJ. OHP enrollment study: Final report. Portland, OR:2010 Accessed April 4, 2010.

40. Lenth R. Java applets for power and sample size. <http://www.stat.uiowa.edu/~rlenth/Power>. Accessed January 2, 2011.
41. Poverty thresholds by size of family. <http://www.census.gov/hhes/www/poverty/data/threshld/index.html>. Accessed June 1, 2011.
42. STATA statistical software: Release 11.2. College Station, TX: StataCorp LP; 2011.
43. Hosmer D, Lemeshow S. *Applied Logistic Regression*. 2nd ed. New York: John Wiley & Sons, Inc.; 2000.
44. Solotaroff R, Devoe J, Wright BJ, et al. Medicaid programme changes and the chronically ill: Early results from a prospective cohort study of the Oregon health plan. *Chronic Illn*. 2005;1(3):191-205.
45. Wright BJ, Carlson MJ, Edlund T, DeVoe J, Gallia C, Smith J. The impact of increased cost sharing on Medicaid enrollees. *Health Aff (Millwood)*. 2005;24(4):1106-1116.
46. DeVoe JE, Ray M, Krois L, Carlson MJ. Uncertain health insurance coverage and unmet children's health care needs. *Fam Med*. 2010;42(2):121-132.
47. Kenney GM, Buettgens M, Guyer J, Heberlein M. Improving coverage for children under health reform will require maintaining current eligibility standards for Medicaid and CHIP. *Health Aff (Millwood)*. 2011;30(12):2371-2381.
48. Kaiser Family Foundation. Health coverage & uninsured: Kaiser state health facts. <http://www.statehealthfacts.org>. Accessed December 19, 2012.
49. Kenney GM, Lynch V, Cook A, Phong S. Who and where are the children yet to enroll in Medicaid and the children's health insurance program? *Health Aff (Millwood)*. 2010;29(10):1920-1929.
50. Buettgens M, Garrett B, Holahan J. America under the affordable care act. Washington, DC: The Urban Institute; 2010.
51. McGee J, Evers M. Suggestions for improving the healthy kids application process: A summary of findings from four evaluation research studies. Vancouver, WA: Portland State University; 2011 Accessed March 3, 2012.

VIII. APPENDIX A: TABLES & CHARTS

Table 23. Demographic Characteristics: Incomplete vs. Complete

Demographic Characteristics	Complete	Incomplete	Design Based F-Test p-value
<b>Application Status</b>			0.4468
Accepted	81.1%	18.9%	
Denied	82.4%	17.6%	
Did not reapply	85.6%	14.4%	
<b>Gender</b>			0.5633
Male	84.2%	15.8%	
Female	80.2%	19.8%	
<b>Age</b>			0.1355
≥ 12 Years	85.9%	14.1%	
< 12 Years	70.3%	61.4%	
<b>Infant</b>			0.0896**
> 2 Years	84.1%	15.8%	
≤ 2 Years	67.2%	32.8%	
<b>Race</b>			0.0304*
White	86.4%	13.6%	
Non-white	23.6%	50.9%	
<b>Ethnicity</b>			0.0772**
Non-Hispanic	89.5%	10.5%	
Hispanic	77.6%	22.4%	
<b>Race/Ethnicity</b>			0.0916**
White, Non-Hispanic	90.1%	9.9%	
Non-White or Hispanic	79.5%	20.5%	
<b>U.S. Born</b>			0.5857
Yes	82.9%	17.1%	
No	75.8%	24.2%	
<b>Language</b>			0.0467*
English	84.9%	15.1%	
Spanish	66.7%	33.3%	
<b>Parental Education</b>			0.1813
≤ High School	79.9%	20.1%	
> High School	89.6%	10.4%	
<b>Parental Employment</b>			0.4268
Employed	79.5%	20.5%	
Unemployed	85.0%	15.0%	
<b>Household Income</b>			0.6746
≤\$15,000	87.6%	12.4%	
>\$15,000	85.1%	14.9%	
<b>Socio-economic Instability</b>			0.5113
Unstable	89.2%	10.8%	
Stable	85.2%	14.8%	
<b>Chronic Disease</b>			0.4937
Yes	86.7%	13.3%	
No	80.6%	19.4%	
<b>Health Status</b>			0.3069
Good-Excellent	78.2%	21.8%	
Fair-Poor	85.3%	14.7%	

\*p<0.05; \*\*p<0.10

**Table 24 . Outcome Variables: Incomplete vs. Complete**

Outcome Variable		Complete	Incomplete	Design Based F-Test p-value
<b>Unmet Healthcare Need</b>				0.4344
	Unmet Need	93.1%	6.9%	
	No Unmet Need	96.4%	3.6%	
<b>Current Insurance</b>				0.2670
	Uninsured	74.6%	25.4%	
	Insured	84.6%	15.4%	
<b>Continuous Insurance</b>				0.0389
	Not Continuous	71.5%	28.5%	
	Continuous	87.3%	12.7%	

\*p<0.05; \*\*p<0.10

**Table 25. Evaluation of Collinearity in Demographic Variables**

Demographic Characteristic	OR	95% CI	p-value
Race & Ethnicity	5.371*	2.055-14.040	0.001
Birthplace & Ethnicity	3.501*	1.173-10.451	0.025
Birthplace & Race	0.114*	0.027-0.486	0.003
Poverty & Employment	0.245*	0.114 -0.526	<0.001
Education & Poverty	1.868	0.888-3.927	0.099
Education & Employment	0.668	0.315-1.416	0.292
Race & Poverty	0.681	0.287-1.617	0.383
Race & Employment	1.329	.0558-3.168	0.520
Race & Education	4.354*	1.403-13.509	0.011
Ethnicity & Poverty	1.127	0.510-2.489	0.767
Ethnicity & Employment	1.073	0.478-2.411	0.864
Ethnicity & Education	2.415*	0.948-6.157	0.065

\*OR<0.5 or >2.0

**Table 26. Demographic Characteristics of the 2007 OHP Disenrollment Study Population: With & Without New Applicants (Weighted Percentages)**

Demographic Characteristics	With New Applicants (n=585)	Without New Applicants (n=392)
<b>Application Status</b>		
Accepted	80.2%	78.4%
Denied	6.9%	2.1%
Did Not Reapply	12.9%	19.5%
<b>Gender</b>		
Male	50.7%	51.5%
Female	49.3%	48.5%
<b>Race</b>		
White	70.7%	75.0%
Non-white	29.3%	25.0%
<b>Ethnicity</b>		
Non-Hispanic	65.5%	70.0%
Hispanic	34.5%	30.0%
<b>U.S. Born</b>		
Yes	92.5%	93.5%
No	7.5%	6.5%
<b>Language</b>		
English	79.2%	84.4%
Spanish	20.8%	15.6%
<b>Parental Education</b>		
≤ High School	70.9%	70.7%
> High School	29.1%	29.3%
<b>Parental Employment</b>		
Employed	43.4%	45.4%
Unemployed	56.6%	54.6%
<b>Household Income</b>		
≤\$15,000	58.7%	61.8%
>\$15,000	41.3%	38.2%
<b>Chronic Disease</b>		
Yes	22.4%	23.7%
No	77.6%	76.3%



**Table 27. Comparisons of Demographic Characteristics According to Application Status**

<b>Demographic Characteristic</b>	<b>Did Not Reapply vs. Applied &amp; Accepted Design based F-test p-value</b>	<b>Did Not Reapply vs. Applied &amp; Denied Design based F-test p-value</b>
<b>Gender</b>	0.3199	0.5640
<b>Age (≥ 12 Years)</b>	0.0047*	0.5723
<b>Infant (≤ 2 Years)</b>	0.0070*	0.2221
<b>Race</b>	0.5320	0.1387
<b>Ethnicity</b>	0.3648	0.3321
<b>Combined Race/Ethnicity</b>	0.1662	0.2800
<b>U.S. Born</b>	0.6816	0.3457
<b>Language</b>	0.5480	0.6565
<b>Parental Education (≤ High School)</b>	0.0126*	0.1186
<b>Parental Employment</b>	0.0006*	0.0491*
<b>Annual Household Income (≤ \$15,000)</b>	0.0008*	0.1869
<b>Socio-Economic Instability (Yes)</b>	0.0008*	0.0829**
<b>Chronic Disease</b>	0.4737	0.1441

\*p<0.05; \*\*p<0.10

**Table 28. Associations between a Child’s Application Status, Unmet Healthcare Needs, Insurance Status, and Medical Debt (Unadjusted Odds Ratios)**

<b>Outcome</b>	<b>Unadjusted Odds Ratio (95% CI)</b>	<b>p-value</b>
<b>Unmet Healthcare Need (Yes)</b>	1.0	
Applied & Accepted	1.8 (0.7-4.7)	0.222
Applied & Denied	<b>2.8 (1.4-5.7)</b>	<b>0.004*</b>
Did Not Reapply		
<b>Continuous Insurance (Yes)</b>	1.0	
Applied & Accepted	<b>0.3 (0.1-0.9)</b>	<b>0.023*</b>
Applied & Denied	<b>0.1 (0.1-0.3)</b>	<b>&lt;0.001*</b>
Did Not Reapply		
<b>Current Insurance Status (Insured)</b>	1.0	
Applied & Accepted	0.6 (0.2-1.8)	0.395
Applied & Denied	<b>0.1 (0.1-0.3)</b>	<b>&lt;0.001*</b>
Did Not Reapply		
<b>Difficulty Paying Medical Bills (Yes)</b>	1.0	
Applied & Accepted	<b>4.4 (1.5-13.0)</b>	<b>0.007*</b>
Applied & Denied	<b>6.1 (2.4-15.6)</b>	<b>&lt;0.001*</b>
Did Not Reapply		
<b>Current Medical Debt (Yes)</b>	1.0	
Applied & Accepted	<b>2.7 (1.1-6.9)</b>	<b>0.035*</b>
Applied & Denied	<b>6.3 (2.9-13.6)</b>	<b>&lt;0.001*</b>
Did Not Reapply		
<b>Recent Medical Visit (Yes)</b>	1.0	
Applied & Accepted	1.0 (0.4-2.4)	0.979
Applied & Denied	0.5 (0.2-1.0)	0.061
Did Not Reapply		
<b>Recent ED Visit (Yes)</b>	1.0	
Applied & Accepted	2.5 (0.7-9.1)	0.153
Applied & Denied	1.8 (0.8-3.7)	0.134
Did Not Reapply		
<b>Usual Source of Care (Yes)</b>	1.0	
Applied & Accepted	1.0 (0.4-2.6)	0.946
Applied & Denied	0.7 (0.3-1.6)	0.370
Did Not Reapply		

\*p<0.05

**Table 29. Model-Building for Specific Aim 2**

Variable (Referent Group)	Model Odds Ratio (95% Confidence Intervals) <i>p-value</i>						
	1	2	3	4	5	6	7
Application Status (DNR, when Accepted=1.0)	2.0 (0.9-4.6) <i>0.087</i>	2.1 (1.0-4.6) <i>0.062</i>	2.0 (0.9-4.5) <i>0.073</i>	2.1 (1.0-4.4) <i>0.065</i>	2.4 (1.1-5.2) <i>0.029</i>	2.8 (1.3-6.1) <i>0.010</i>	3.3 (1.5-6.9) <i>0.002</i>
Application Status (DNR, when Denied=1.0)	1.3 (0.5-3.8) <i>0.593</i>	1.4 (0.5-3.9) <i>0.517</i>	1.3 (0.5-3.3) <i>0.585</i>	1.3 (0.5-3.4) <i>0.572</i>	1.4 (0.5-3.6) <i>0.518</i>	1.6 (0.7-3.8) <i>0.314</i>	1.6 (0.7-4.0) <i>0.285</i>
Current Health (Fair to Poor=1.0)	0.9 (0.4-2.0) <i>0.769</i>						
Chronic Disease (No=1.0)	1.4 (0.6-3.6) <i>0.437</i>	1.4 (0.6-3.6) <i>0.452</i>					
Parental Education (>High School =1.0)	0.7 (0.3-1.6) <i>0.444</i>	0.7 (0.3-1.6) <i>0.421</i>	0.7 (0.3-1.6) <i>0.390</i>				
Socio-economic stability (Unstable=1.0)	0.7 (0.3-1.5) <i>0.328</i>	0.7 (0.3-1.6) <i>0.359</i>	0.7 (0.3-1.5) <i>0.350</i>	0.6 (0.3-1.3) <i>0.198</i>			
Race/Ethnicity (White, Non-Hispanic=1.0)	0.5 (0.2-1.1) <i>0.087</i>	0.5 (0.2-1.2) <i>0.099</i>	0.5 (0.2-1.2) <i>0.101</i>	0.4 (0.2-1.0) <i>0.064</i>	0.5 (0.2-1.1) <i>0.098</i>		
Age ≤ 2 (Age 2-12=1.0)	3.9 (1.1-14.1) <i>0.037</i>	4.0 (1.1-14.2) <i>0.033</i>	4.3 (1.2-15.1) <i>0.023</i>	4.4 (1.2-15.8) <i>0.023</i>	4.5 (1.1-17.8) <i>0.034</i>	3.5 (0.9-13.4) <i>0.071</i>	
Age ≥ 12 (Age 2-12=1.0)	1.8 (0.7-4.2) <i>0.196</i>	1.8 (0.7-4.2) <i>0.207</i>	1.9 (0.8-4.4) <i>0.135</i>	2.1 (0.9-5.0) <i>0.079</i>	2.2 (1.0-5.1) <i>0.064</i>	2.2 (1.0-5.2) <i>0.064</i>	1.8 (0.7-9.2) <i>0.166</i>

**Table 30. Odds of Unmet Healthcare Needs in Children with and without Continuous Insurance, Stratified by Application Status (Unweighted Data)**

Applied & Accepted		No Unmet Need	Unmet Need	Odds Ratio
	<b>Not Continuous</b>	1 (14.3%)	6 (85.7%)	1.0
	<b>Continuous</b>	60 (79.0%)	16 (21.0%)	0.04
Applied & Denied				
	<b>Not Continuous</b>	17 (51.5%)	16 (48.5%)	1.0
	<b>Continuous</b>	40 (66.7%)	20 (33.3%)	0.53
Did Not Reapply				
	<b>Not Continuous</b>	33 (32.3%)	51 (60.7%)	1.0
	<b>Continuous</b>	53 (73.6%)	19 (26.4%)	0.23

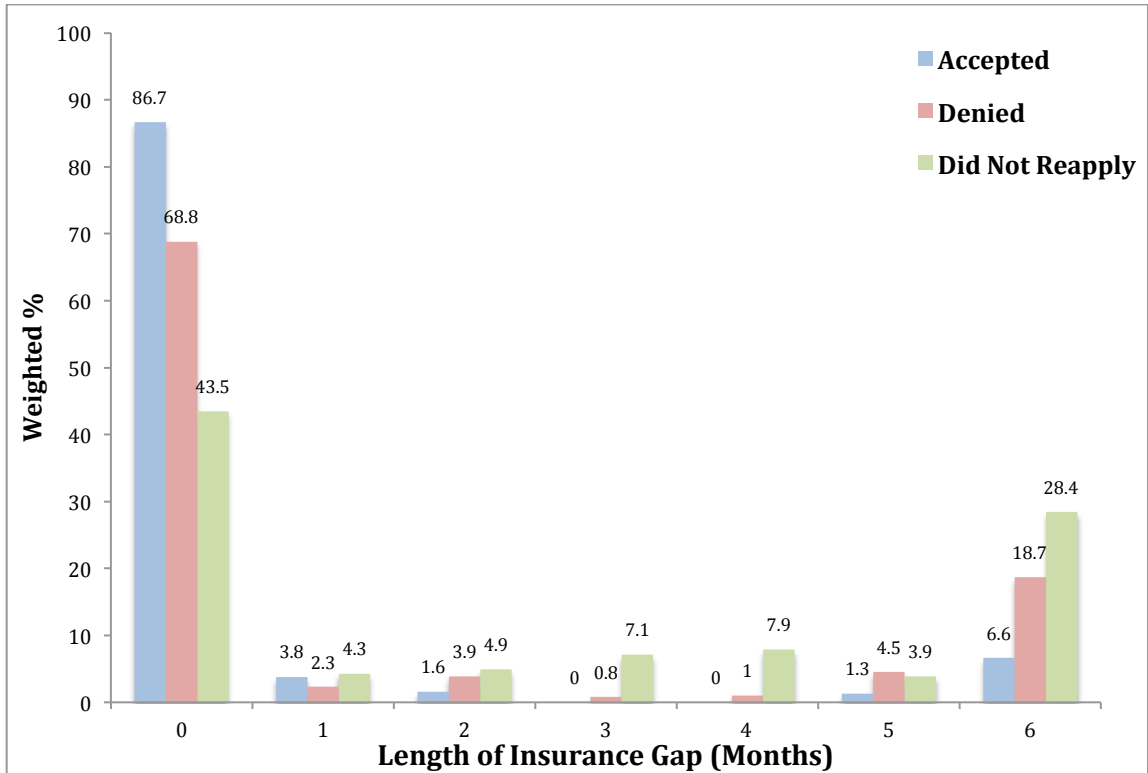
**Table 31. Parameters for Final Multivariate Logistic Regression Model: Specific Aim 2 (Unmet Healthcare Needs)**

Independent Variable	$\beta$	Std. Error	Wald Test p-value
<b>Application Status</b>			
Applied & Denied	0.164	0.559	0.769
Did Not Reapply	0.025	0.491	0.959
<b>Continuous Insurance</b>	-2.134	0.548	<0.001*
<b>Age <math>\geq 12</math></b>	0.888	0.474	0.062**
<b>Age <math>\leq 2</math></b>	1.023	0.765	0.182
<b>Intercept</b>	0.279	0.650	0.668

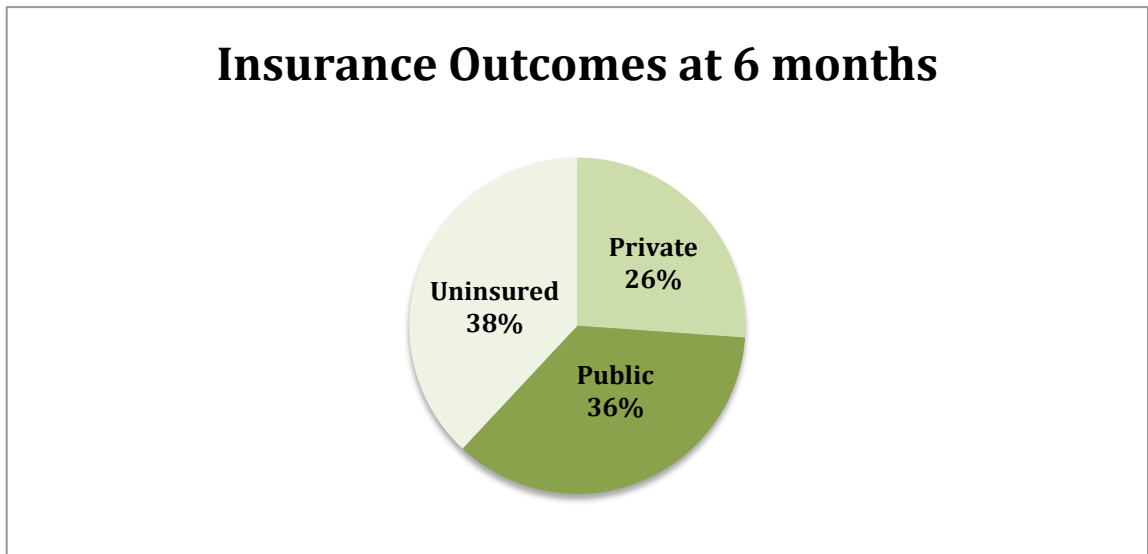
\*p<0.05, \*\*p<0.10

**Estimated Logit Equation: Specific Aim 2 (Unmet Healthcare Needs)**

$$g(\text{Unmet Healthcare Need}) = 0.279 + 0.164 * (\text{Application Status: Denied}) + 0.025 * (\text{Application Status: Did Not Reapply}) + 0.888 * (\text{Age} \geq 12) + 1.023 (\text{Age} \leq 2) - 2.134 * (\text{Continuous Insurance})$$



**Figure 4. Prevalence of insurance gaps by application status**



**Figure 4. Types of health insurance at 6 months among children who were disenrolled from the Oregon Health Plan**

**Table 32. Reasons for OHP Disenrollment and Current Insurance Status**

Reason for not Reapplying	Current Insurance	
	Yes	No
Income too high	63.3%	36.7%
Found other insurance	83.2%	16.8%
Forgot to reapply	37.0%	63.0%
Paperwork too much of a hassle	50.4%	49.6%
Dissatisfied with the program	31.1%	68.9%
Could not find paperwork to prove citizenship	28.8%	71.2%
Could not find other required paperwork	31.2%	68.8%
Some other reason	70.4%	29.6%
Do not know why	16.5%	83.5%
Did reapply during that time period	66.5%	33.5%

**Table 33. Model-Building for Specific Aim 3: Predictors for Attainment of Health Insurance**

Variable (Referent Group)	Model Odds Ratio (95% CI) <i>p-value</i>				
	1	2	3	4	5
U.S. Born (Yes=1.0)	<b>1.04</b> (0.28-3.85) <i>0.954</i>				
Language (English=1.0)	0.78 (0.24-2.56) <i>0.685</i>	<b>0.77</b> (0.24-2.51) <i>0.668</i>			
Infant (Age>2=1.0)	1.39 (0.39-5.01) <i>0.607</i>	1.40 (0.39-4.95) <i>0.601</i>	<b>1.43</b> (0.42-4.86) <i>0.563</i>		
Parental Employment (Employed=1.0)	2.06 (0.65-6.50) <i>0.217</i>	2.05 (0.66-6.38) <i>0.212</i>	2.07 (0.65-6.64) <i>0.217</i>	<b>2.16</b> (0.70-6.72) <i>0.179</i>	
Burdensome Process (No=1.0)	0.27 (0.10-0.74) <i>0.012</i>	0.27 (0.09-0.75) <i>0.012</i>	0.25 (0.09-0.73) <i>0.012</i>	0.27 (0.09-0.86) <i>0.027</i>	<b>0.19</b> (0.06-0.61) <i>0.006</i>

\*p<0.05

**Table 34. Potential Interaction Terms for Specific Aim 3**

Interaction Term	Adjusted Wald F-Test	p-value
Burdensome Process*Gender	1.72	0.088
Burdensome Process*Age (≥ 12)	0.14	0.079
Burdensome Process*Age (<2)	0.95	0.342
Burdensome Process*Race	0.98	0.330
Burdensome Process*Ethnicity	-0.06	0.949
Burdensome Process*Race/Ethnicity	-0.15	0.884
Burdensome Process*Birthplace	0.12	0.901
Burdensome Process *Language	0.16	0.871
Burdensome Process*Education	0.34	0.732
Burdensome Process*Employment	1.03	0.304
Burdensome Process*Poverty	-0.93	0.357
Burdensome Process*Socioeconomic Instability	-1.79	0.076
Burdensome Process*Chronic Disease	-0.16	0.876

\*p&lt;0.05

**Table 35. Parameters for Final Multivariate Logistic Regression Model: Specific Aim 3 (Attainment of Health Insurance)**

Predictor Variable	$\beta$	Std. Error	Wald Test p-value	95% CI
<b>Burdensome Process</b>	-1.38	0.54	0.012*	-2.44, -0.31
<b>Parental Employment</b>	0.73	0.59	0.217	-0.44, 1.89
<b>Age (≤ 2 years old)</b>	0.36	0.58	0.563	-0.86, 1.58
<b>Intercept</b>	0.34	0.51	0.509	-0.67, 1.35

\*p&lt;0.05

**Estimated Logit Equation: Specific Aim 3 (Attainment of Health Insurance)**

$$g(\text{Current Insurance}) = 0.34 - 1.38 * (\text{Burdensome Process}) + 0.73 * (\text{Parental Employment}) + 0.36 (\text{Age} \leq 2 \text{ years old})$$

**Table 36. Demographic Characteristics: Burdensome Process Requirements vs. Improved Circumstances**

Demographic Characteristics		Improved Circumstances	Burdensome Process	Design Based F-Test p-value
<b>Gender</b>				0.3741
	Male	75.5%	24.5%	
	Female	66.0%	34.0%	
<b>Age</b>				0.3590
	≥ 12 Years	60.9%	39.1%	
	< 12 Years	73.8%	26.2%	
<b>Infant</b>				0.0262*
	> 2 Years	76.7%	23.3%	
	≤ 2 Years	52.5%	47.5%	
<b>Race</b>				0.0196*
	White	76.3%	23.7%	
	Non-white	48.6%	51.4%	
<b>Ethnicity</b>				0.0001*
	Non-Hispanic	81.5%	18.5%	
	Hispanic	37.6%	62.4%	
<b>Race/Ethnicity</b>				0.0002*
	White, Non-Hispanic	82.2%	17.8%	
	Non-White or Hispanic	42.5%	57.5%	
<b>U.S. Born</b>				0.1042
	Yes	76.1%	46.9%	
	No	53.2%	23.8%	
<b>Language</b>				0.0005*
	English	79.7%	20.3%	
	Spanish	37.5%	62.5%	
<b>Parental Education</b>				0.0028*
	≤ High School	57.2%	42.8%	
	> High School	86.7%	13.3%	
<b>Parental Employment</b>				0.0013*
	Employed	45.8%	54.2%	
	Unemployed	81.4%	18.6%	
<b>Household Income</b>				0.0521**
	≤\$15,000	54.0%	46.0%	
	>\$15,000	80.5%	19.5%	
<b>Socio-economic Instability</b>				0.0011*
	Unstable	89.3%	10.7%	
	Stable	55.0%	45.0%	
<b>Chronic Disease</b>				0.4583
	Yes	78.0%	22.0%	
	No	69.4%	30.6%	

\*p<0.05; \*\*p<0.10



**Table 37. Type of Insurance at 6 Months by Employment Status**

	<b>Type of Insurance</b>		
<b>Employment Status</b>	<b>Private</b>	<b>Public</b>	<b>Uninsured</b>
<b>Employed</b>	29.7%	21.8%	48.5%
<b>Unemployed</b>	25.7%	41.4%	32.9%

IX. APPENDIX B

# Oregon Health Plan Survey

For Parents of Children Who Applied for New or Renewed Coverage

Thank you for helping us better understand health insurance and health care for children in Oregon. All questions on this survey refer to health care for your child. If you have more than one child, please answer for the child named in the letter you received with this survey. When finished, please put the survey in the postage-paid envelope and mail it. If you have questions about this survey, please call 1-800-647-0907.

### Survey Instructions

1. Answer all the questions by checking the box to the left of the answer.
2. You are sometimes told to skip over questions in this survey. When this happens, you will see an arrow with a note that tells you what question to answer next, like this:  
 Yes → [GO TO QUESTION 1]  
 No

### START HERE ↓

#### Your Child's Health Coverage

1. Our records show that you applied or re-applied for your child to receive the Oregon Health Plan (OHP) between September 2006 and May 2007. Was your child's application approved?  
 Yes → (Skip to Question 3)  
 No, it was denied  
 No, I was told it was pending or that I had to send more paperwork  
 I'm not sure  
 I didn't apply or reapply to OHP for my child → (Skip to Question 3)
2. If the application was denied, what was the main reason? *Check all that apply.*  
 Our income or assets were too high  
 I was told my child hadn't been uninsured long enough to qualify  
 I was late turning the application in  
 I could not send paperwork to prove my child's citizenship (birth certificate, naturalization papers, etc.)  
 Some other reason: \_\_\_\_\_  
 I don't know why
3. Does your child **currently** have health insurance through any of the following? *Check all that apply.*  
 Oregon Health Plan or Medicaid  
 Medicare  
 Yours or a family member's employer.  
 A private plan I pay for myself.  
 Other coverage: \_\_\_\_\_  
 My child has no insurance now.  
 I don't know
4. For how many of the last six months did your child have some kind of health insurance?  
 No insurance during last 6 months  
 1 Month  
 2 Months  
 3 Months  
 4 Months  
 5 Months  
 Insured for all of the last 6 months



## Your Child's Health Care

5. Is there a place your child usually goes to receive medical care?
- Yes
- No → (Skip to Question 7)
6. Where does your child usually go to receive medical care? *Mark only one.*
- A private doctor's office or clinic
- A public health clinic, community health center, or tribal clinic
- A hospital-based clinic
- A hospital emergency room
- An urgent care clinic
- Some other place not listed here
- I don't have a usual place
- I don't know
7. Was there a time in the last 6 months when your child needed medical care?
- Yes
- No → (Skip to Question 10)
8. If your child needed medical care in the last six months, did he or she get ALL the medical care that was needed?
- Yes
- No
- My child didn't need care in the last six months
9. The *most recent time* your child went without needed medical care, what were the main reasons? *Check all that apply.*
- It cost too much
- My child doesn't have insurance
- The doctor wouldn't take our insurance
- I owed money to the care provider
- I couldn't get an appointment quickly enough
- The office wasn't open when I could get there with my child
- My child has no doctor
- Some other reason: \_\_\_\_\_
- I don't know
10. In the last 6 months, has your child needed any prescription medications?
- Yes
- No → (Skip to Question 13)
11. If your child needed prescription medications in the last six months, did he or she get ALL the needed medications?
- Yes
- No
- My child didn't need medications in the last six months
12. The *most recent time* your child went without prescription medications he or she needed, what were the main reasons? *Check all that apply.*
- They cost too much
- My child has no insurance
- My child has no doctor
- I couldn't get a prescription
- I couldn't get to the pharmacy
- Some other reason: \_\_\_\_\_
- I don't know
13. In the last 6 months, has your child needed any dental care?
- Yes
- No → (Skip to Question 15)
14. If your child needed dental care in the last six months, did he or she get all needed care?
- Yes
- No
- My child didn't need dental care in the last six months
15. In the last 6 months, how many times did your child go to a doctor's office, clinic, or other health care provider to get care? *Don't include emergency room or hospital visits. Your best estimate is fine.*
- None
- 1 time
- 2 times
- 3 or more times



16. In the last 6 months, how many times did your child go to an emergency room to get care? *Your best estimate is fine.*

- None
- 1 time
- 2 times
- 3 or more times

17. What was the reason your child went to the emergency room instead of somewhere else for health care? *Mark all that apply.*

- My child needed emergency care
- Doctors' offices/clinics were closed
- I couldn't get an appointment to see a regular doctor soon enough
- My child has no regular doctor
- I couldn't afford the copay for my child to see a doctor
- My child needed a prescription drug
- I don't know where else to take my child
- Some other reason: \_\_\_\_\_
- I don't know

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### Your Child's Health Care Costs


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18. In the last 6 months, have you had to borrow money, skip paying other bills, or pay other bills late to pay your child's health bills?

- No
- Yes

19. Do you currently owe money to a health care provider, credit card company, or anyone else for your child's medical expenses?

- No
- Yes

 If yes, about how much do you owe? \_\_\_\_\_

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### Your Child's Health

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20. In general, would you say your child's health is:

- Excellent
- Very Good
- Good
- Fair
- Poor

21. How has your child's health changed in the last six months?

- His or her health has gotten better
- His or her health is about the same
- His or her health has gotten worse

22. In the past six months, have problems with your child's health interfered with any of the following? *Check all that apply.*

- School
- Social activities with friends
- Family activities

23. Have you ever been told by a doctor or other health professional that your child has any of the following? *Check all that apply.*

- Diabetes or sugar diabetes
- Asthma
- Another chronic health condition (tell us): \_\_\_\_\_

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### About Your Family

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24. Is your child male or female?

- Male
- Female

25. What YEAR was your child born? \_\_\_\_\_

26. Was your child born in the United States?

- Yes
- No





27. If your child was born in the U.S., in what city and State was he or she born?  
 City \_\_\_\_\_  
 State \_\_\_\_\_
28. Are you (the parent) currently employed or self employed? *Mark only one.*
- Yes, employed
  - Yes, self-employed
  - Not currently employed
  - I am retired
29. About how many hours per week, on average, do you work at your current job?
- Less than 20 hours per week
  - 20-29 hours per week
  - 30 or more hours per week
30. What was your gross household income (before taxes and deductions are taken out) for last year (2006?) *Your best estimate is fine.*
- \$0
  - \$1 to \$2,500
  - \$2,501 to \$5,000
  - \$5,001 to \$7,500
  - \$7,501 to \$10,000
  - \$10,001 to \$12,500
  - \$12,501 to \$15,000
  - \$15,001 to \$17,500
  - \$17,501 to \$20,000
  - \$20,001 to \$22,500
  - \$22,501 to \$25,000
  - \$25,001 to \$27,500
  - \$27,501 to \$30,000
  - \$30,001 to \$32,500
  - \$32,501 to \$35,000
  - \$35,501 to \$37,500
  - \$37,501 to \$40,000
  - \$40,001 to \$42,500
  - \$42,500 to \$45,000
  - \$45,001 to \$47,500
  - \$47,500 to \$50,000
  - \$50,001 or more
31. Would you describe your child as Spanish, Hispanic, or Latino?
- Yes
  - No
32. How would you describe your child's race?
- White
  - Black or African-American
  - American Indian or Alaska Native
  - Asian
  - Native Hawaiian or Pacific Islander
  - Other: \_\_\_\_\_
33. What is the highest level of education you (the parent) have completed?
- Less than high school
  - High school diploma or GED
  - Vocational training or 2-year degree
  - A 4-year college degree or more
34. How many family members, including yourself, counting all adults and children, are living in your home? \_\_\_\_\_
35. Of the family members living in your house, how many are under 19? \_\_\_\_\_
36. Thinking about the family members in your house under 19 years of age, how many are currently covered by some kind of health insurance?  
 \_\_\_\_\_
- Thank you very much for taking the time to complete this survey. Please place it in the postage-paid envelope and mail it.

# Oregon Health Plan Survey

## For Parents of Children Who Did Not Apply to Renew Coverage

Thank you for helping us better understand health insurance and health care for children in Oregon. All questions on this survey refer to health care for your child. If you have more than one child, please answer for the child named in the letter you received with this survey. When finished, please put the survey in the postage-paid envelope and mail it. If you have questions about this survey, please call 1-800-647-0907.

### Survey Instructions

1. Answer all the questions by checking the box to the left of the answer.
2. You are sometimes told to skip over questions in this survey. When this happens, you will see an arrow with a note that tells you what question to answer next, like this:
  - Yes → [GO TO QUESTION 1]
  - No

### START HERE ↓

#### Your Child's Health Coverage

1. Our records show that your child's Oregon Health Plan (OHP) membership expired between September 2006 and May 2007, and that you did NOT reapply at that time. Why didn't you reapply to OHP for your child? *Check all that apply.*
  - My income or assets were too high
  - Found other insurance for my child
  - I just forgot
  - The paperwork is too much of a hassle
  - I was dissatisfied with the program
  - I could not find my paperwork to prove my child's citizenship (birth certificate, naturalization papers, etc.)
  - I could not find other required paperwork (proof of income, etc)
  - Some other reason: \_\_\_\_\_
  - I don't know why
  - I did reapply for my child's coverage during that time period
2. Does your child **currently** have health insurance through any of the following? *Check all that apply.*
  - Oregon Health Plan or Medicaid
  - Medicare
  - Yours or a family member's employer
  - A private plan I pay for myself
  - Other coverage: \_\_\_\_\_
  - My child has no insurance now
  - I don't know
3. For how many of the last six months did your child have some kind of health insurance?
  - No insurance during last 6 months
  - 1 Month
  - 2 Months
  - 3 Months
  - 4 Months
  - 5 Months
  - Insured for all of the last 6 months



## Your Child's Health Care

4. Is there a place your child usually goes to receive medical care?
- Yes
- No → (Skip to Question 7)
5. Where does your child usually go to receive medical care? *Mark only one.*
- A private doctor's office or clinic
- A public health clinic, community health center, or tribal clinic
- A hospital-based clinic
- A hospital emergency room
- An urgent care clinic
- Some other place not listed here
- I don't have a usual place
- I don't know
6. Was there a time in the last 6 months when your child needed medical care?
- Yes
- No → (Skip to Question 9)
7. If your child needed medical care in the last six months, did he or she get ALL the medical care that was needed?
- Yes
- No
- My child didn't need care in the last six months
8. The *most recent time* your child went without needed medical care, what were the main reasons? *Check all that apply.*
- It cost too much
- My child doesn't have insurance
- The doctor wouldn't take our insurance
- I owed money to the care provider
- I couldn't get an appointment quickly enough
- The office wasn't open when I could get there with my child
- My child has no doctor
- Some other reason: \_\_\_\_\_
- I don't know
9. In the last 6 months, has your child needed any prescription medications?
- Yes
- No → (Skip to Question 13)
10. If your child needed prescription medications in the last six months, did he or she get ALL the needed medications?
- Yes
- No
- My child didn't need medications in the last six months
11. The *most recent time* your child went without prescription medications he or she needed, what were the main reasons? *Check all that apply.*
- They cost too much
- My child has no insurance
- My child has no doctor
- I couldn't get a prescription
- I couldn't get to the pharmacy
- Some other reason: \_\_\_\_\_
- I don't know
12. In the last 6 months, has your child needed any dental care?
- Yes
- No → (Skip to Question 14)
13. If your child needed dental care in the last six months, did he or she get all needed care?
- Yes
- No
- My child didn't need dental care in the last six months
14. In the last 6 months, how many times did your child go to a doctor's office, clinic, or other health care provider to get care? *Don't include emergency room or hospital visits. Your best estimate is fine.*
- None
- 1 time
- 2 times
- 3 or more times





15. In the last 6 months, how many times did your child go to an emergency room to get care? *Your best estimate is fine.*

- None
- 1 time
- 2 times
- 3 or more times

16. What was the reason your child went to the emergency room instead of somewhere else for health care? *Mark all that apply.*

- My child needed emergency care
- Doctors' offices/clinics were closed
- I couldn't get an appointment to see a regular doctor soon enough
- My child has no regular doctor
- I couldn't afford the copay for my child to see a doctor
- My child needed a prescription drug
- I don't know where else to take my child
- Some other reason: \_\_\_\_\_
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---

### Your Child's Health Care Costs


---

17. In the last 6 months, have you had to borrow money, skip paying other bills, or pay other bills late to pay your child's health bills?

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18. Do you currently owe money to a health care provider, credit card company, or anyone else for your child's medical expenses?

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- Yes

 If yes, about how much do you owe? \_\_\_\_\_

---

### Your Child's Health

---

19. In general, would you say your child's health is:

- Excellent
- Very Good
- Good
- Fair
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20. How has your child's health changed in the last six months?

- His or her health has gotten better
- His or her health is about the same
- His or her health has gotten worse

21. In the past six months, have problems with your child's health interfered with any of the following? *Check all that apply.*

- School
- Social activities with friends
- Family activities

22. Have you ever been told by a doctor or other health professional that your child has any of the following? *Check all that apply.*

- Diabetes or sugar diabetes
- Asthma
- Another chronic health condition (tell us): \_\_\_\_\_

---

### About Your Family

---

23. Is your child male or female?

- Male
- Female

24. What YEAR was your child born? \_\_\_\_\_

25. Was your child born in the United States?

- Yes
- No





26. If your child was born in the U.S., in what city and State was he or she born?  
 City \_\_\_\_\_  
 State \_\_\_\_\_
27. Are you (the parent) currently employed or self employed? *Mark only one.*
- Yes, employed
  - Yes, self-employed
  - Not currently employed
  - I am retired
27. About how many hours per week, on average, do you work at your current job?
- Less than 20 hours per week
  - 20-29 hours per week
  - 30 or more hours per week
29. What was your gross household income (before taxes and deductions are taken out) for last year (2006?) *Your best estimate is fine.*
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  - \$15,001 to \$17,500
  - \$17,501 to \$20,000
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  - \$22,501 to \$25,000
  - \$25,001 to \$27,500
  - \$27,501 to \$30,000
  - \$30,001 to \$32,500
  - \$32,501 to \$35,000
  - \$35,501 to \$37,500
  - \$37,501 to \$40,000
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  - \$42,500 to \$45,000
  - \$45,001 to \$47,500
  - \$47,500 to \$50,000
  - \$50,001 or more
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  - Black or African-American
  - American Indian or Alaska Native
  - Asian
  - Native Hawaiian or Pacific Islander
  - Other: \_\_\_\_\_
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  - High school diploma or GED
  - Vocational training or 2-year degree
  - A 4-year college degree or more
33. How many family members, including yourself, counting all adults and children, are living in your home? \_\_\_\_\_
34. Of the family members living in your house, how many are under 19? \_\_\_\_\_
35. Thinking about the family members in your house under 19 years of age, how many are currently covered by some kind of health insurance?  
 \_\_\_\_\_
- Thank you very much for taking the time to complete this survey. Please place it in the postage-paid envelope and mail it.