



A Cohort Study of Public Health Insurance Coverage Loss among Oregon Adolescents

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# A Cohort Study of Public Health Insurance Coverage Loss among Oregon Adolescents

## Abstract

### ABSTRACT

**Introduction:** Churning on and off and/or experiencing coverage gaps is common among public health insurance recipients. Although the Affordable Care Act (ACA) provisions to extend parental coverage for adolescents transitioning to young adulthood on private insurance plans were implemented in 2010, no such protection was mandated for adolescents with public health insurance.

**Methods:** Oregon public health insurance enrollment and electronic health record data from community health centers were used to conduct a retrospective, observational cohort study of Oregon adolescents (17-19 years of age) with public coverage [January 1, 2011-December 31, 2013 (n=51,988)] to assess loss. Time-to-event methods determined the association of coverage loss with sociodemographic characteristics.

**Results:** Although adolescents are vulnerable to coverage loss as they age *out* of child public health insurance coverage, >35% of 19 year olds in this study kept their coverage for up to one year after their 19<sup>th</sup> birthday.

**Conclusions:** Our findings suggest that the support many community health centers offer to help their patients maintain insurance coverage may be having an impact, especially during this important transition period. Additional research to understand how these 19 year olds were able to keep coverage will provide recommendations for future adolescents as they transition to young adulthood.

## Keywords

Medicaid; health insurance; adolescents; young adults

## Cover Page Footnote

We thank the practice-based research network (PBRN) and all clinics in the PBRN for making this research possible.

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## **A Cohort Study of Public Health Insurance Coverage Loss among Oregon Adolescents**

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### **ABSTRACT**

Churning on and off and/or experiencing coverage gaps is common among public health insurance recipients. Although Affordable Care Act provisions to extend parental coverage for adolescents transitioning to young adulthood on private insurance plans were implemented in 2010, no such protection was mandated for adolescents with public health insurance. Oregon public health insurance enrollment and electronic health record data from community health centers were used to conduct a retrospective, observational cohort study of Oregon adolescents (17-19 years of age) with public coverage [January 1, 2011-December 31, 2013 (n=51,988)] to assess loss. Time-to-event methods determined the association of coverage loss with sociodemographic characteristics. Although adolescents are vulnerable to coverage loss as they age *out* of child public health insurance coverage, >35% of 19 year olds in this study kept their coverage for up to one year after their 19<sup>th</sup> birthday. Our findings suggest that the support many community health centers offer to help their patients maintain insurance coverage may be having an impact, especially during this important transition period. Additional research to understand how these 19 year olds were able to keep coverage will provide recommendations for future adolescents as they transition to young adulthood.

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**Keywords:** Medicaid; health insurance; adolescents; young adults; Affordable Care Act

## INTRODUCTION

There is strong evidence that having continuous health insurance coverage improves timely access to healthcare services.(Aiken, Freed, & Davis, 2004; Guevara et al., 2014; Olson, Tang, & Newacheck, 2005; Schoen & DesRoches, 2000) Yet, for complex reasons, millions of individuals in the United States (US) have difficulty maintaining continuous coverage. ‘Churning’ on and off of insurance programs and/or experiencing significant coverage gaps is common, especially for children enrolled in state public health insurance programs.(Collins, Robertson, Garber, & Doty, 2012; P. F. Short, Graefe, & Schoen, 2003; Pamela Farley Short, Graefe, Swartz, & Uberoi, 2012)

Many health problems, such as motor vehicle injuries, substance abuse, and sexually transmitted infections peak during young adulthood making access to healthcare critical during this time.(Park, Paul Mulye, Adams, Brindis, & Irwin, 2006; Sharma, O'Hare, Antonelli, & Sawicki, 2014) However, the transition from adolescence to young adulthood is a time when individuals may be particularly susceptible to churning because Children’s Health Insurance Program (CHIP) coverage usually ends at the age of 19 and has different income eligibility thresholds and availability than adult Medicaid programs.(DeVoe et al., 2015; Henry J. Kaiser Family Foundation, 2010, 2016) For example, eligibility for children allow higher family income than those for adults. Further, adolescents often struggle with the transition to management of their own healthcare as they move into adulthood, especially those with chronic conditions, special needs, and from low-income families.(Neinstein & Irwin, 2013; Sharma et al., 2014) Prior cross-sectional studies reported lower rates of coverage among 19 year-olds, compared to younger adolescents (Nicholson et al., 2009; Trenholm, Harrington, & Dye, 2015) and a 42% decrease in Medicaid coverage after turning 19 years of age.(Henry J. Kaiser Family Foundation, 2010) Many past studies relied on self-report to explore age-associated health insurance coverage loss, which can be subject to bias.(Bhandari & Wagner, 2006; Choi & Pak, 2005; Henry J. Kaiser Family Foundation, 2014) This study applies a more objective measure of coverage by using Oregon public health insurance enrollment and electronic health record (EHR) data to determine the health coverage status of adolescents.

The Affordable Care Act (ACA) implemented provisions in 2010 to extend parental private health insurance coverage for adolescents transitioning to young adulthood, increasing the inclusion from 18 to 26 years of age.(Grace et al., 2015; Sommers & Kronick, 2012) Similar protection for adolescents on public health insurance plans was not mandated and those who age out are likely to become uninsured.(Henry J. Kaiser Family Foundation, 2010) Current data also show there is a 7% increase in uninsured rates when adolescents turn 19 years of age and 4% at age 26 corresponding to the end of CHIP and additional private coverage provisions, respectively.(U.S. Centers for Medicare & Medicaid Services, 2016) Thus, transition preparation and support for insurance maintenance is especially important during this critical time period.(Harrington, 2015) The purpose of this study was to identify the sociodemographics of adolescents transitioning to young adulthood who lost public health insurance which could inform future health policies for this vulnerable population.

## METHODS

### Data Sources

In Oregon those with Medicaid and CHIP are covered by the Oregon Health Plan (OHP). CHIP income eligibility during the study period (2011-2013) was  $\leq 250\%$  of the federal poverty level (FPL) for the family, while Medicaid income eligibility was  $< 50\%$  FPL for parents (more limited for adults without children). (Heberlein, Brooks, Guyer, Artiga, & Stephens, 2012) We linked OHP enrollment data to OCHIN (not an acronym) EHR data using the unique OHP identification number available in both data sources to assess healthcare visits. OCHIN provides and maintains an Epic<sup>®</sup> EHR for community health centers (CHCs) in over 420 clinic locations in 18 states; patients have one unique identifier across all clinics. (DeVoe, Gold, et al., 2011; DeVoe & Sears, 2013)

#### Study Population

Using OHP enrollment data, we identified adolescents (aged 17 to 19 years) with OHP coverage on and prior to their birthday(s) between January 1, 2011 and December 31, 2013, who were covered under general eligibility standards, not special statuses (e.g., pregnancy, disability, etc.) (n=56,986). We excluded those missing information on urban/rural residency status (n=4,025) and/or family income (n=973). Adolescents could have been excluded for one or both of the aforementioned reasons. The final study sample included 51,988 *distinct* Oregon adolescents. Adolescents were included in the analysis for each age cohort during the three-year study time frame: some adolescents were included in more than one age cohort. The number of adolescents assigned to the following age cohorts were: 17 year olds=31,306; 18 year olds=29,222; and 19 year olds=21,390. See appendix for more information.

#### Measures

We examined time from 17<sup>th</sup>, 18<sup>th</sup>, or 19<sup>th</sup> birthday to OHP coverage loss using start and end dates of coverage from OHP enrollment data. Any gaps in coverage of  $\leq 45$  days were considered administrative gaps and deemed continuous coverage. (DeVoe, Gold, et al., 2011; Dombkowski, Lantz, & Freed, 2004; Shin, Sharac, Zur, Rosenbaum, & Paradise, 2015)

Independent variables included sociodemographic characteristics: age, sex, race, ethnicity, language, percentage of FPL based on family income and size, history of a healthcare visit to a CHC included in the OCHIN network during the study period (2011-2013), and urbanicity. We included visits to an OCHIN CHC as we hypothesized that these clinics may provide a usual source of care for patients which might help patients stay insured. (DeVoe, Tillotson, et al., 2011; DeVoe, Tillotson, Wallace, Lesko, & Angier, 2012) Residential zip code at the time of each adolescent's birthday was classified as either urban or rural as defined by Oregon Office of Rural Health. (DeVoe, Ray, Krois, & Carlson, 2010) Federal poverty level was categorized by adolescent's program eligibility reporting code at the time of his/her birthday. In multivariable analyses, race, ethnicity, and language were combined into one 5-category variable to avoid multicollinearity of these individual variables. Race/ethnicity categories included: 1) Hispanic and/or Spanish-speaking; 2) Hispanic and English-speaking; 3) Non-Hispanic, white, and English-speaking; 4) Non-Hispanic, Asian/Pacific Islander, American Indian/Alaska Native, Black, unknown race, and English-speaking (referred to as 'Non-Hispanic, non-white, English'); and, 5) Other, those with unknown ethnicity of any race and/or language other than Spanish or English, Non-Hispanic, white and unknown/other language, or unknown ethnicity with unknown/other language.

#### Analysis

We stratified by age and depicted the sociodemographic characteristics of the study cohort using descriptive statistics. We examined median days to OHP coverage loss and probability of

losing coverage within one and six months, and one year of each birthday using Kaplan-Meier product-limit life table analysis.(Tsai, Jewell, & Wang, 1987) Using Cox proportional hazards regression,(Cox, 1972) we examined the association of each independent variable with time to OHP coverage loss while adjusting for all other covariates. Multivariable models examined OHP coverage loss within one year after each birthday and met proportional hazards assumptions.

Analyses were conducted using SAS Enterprise Guide Version 7.1 (SAS Institute, Inc., Cary, NC). Statistical tests were two-sided and significance was defined as a p-value <0.05. This study was approved by the institutional review board at our institution.

## RESULTS

### Sociodemographic Characteristics

Among 17, 18, and 19 year olds, the majority of the sample of Oregon adolescents covered by OHP were male (17 year olds: 52.3%, 18 year olds: 53.8%, 19 year olds: 54.6%), non-Hispanic, white, and English-speaking (52.5%, 54.0%, and 57.2%, respectively), resided in an urban area (57.1%, 56.7%, and 56.3%, respectively), lived in a household earning <100% FPL (56.6%, 58.5%, and 72.9%, respectively), and did not receive healthcare at an OCHIN CHC (75.8%, 77.6%, and 79.3%, respectively).

**Table 1.** Characteristics of Oregon Adolescents with Oregon Health Plan Coverage in 2011-2013, Stratified by Age

<b>Adolescent Characteristics</b>	<b>17 Year Olds n=31,306</b>	<b>18 Year Olds n=29,222</b>	<b>19 Year Olds n=21,390</b>
Sex			
Female	14,936 (47.7)	13,533 (46.3)	9,741 (45.4)
Male	16,370 (52.3)	15,689 (53.8)	11,649 (54.6)
Race/Ethnicity/Language <sup>a</sup>			
Non-Hispanic, white, English-speaking	16,441 (52.5)	15,784 (54.0)	12,244 (57.2)
Hispanic and/or Spanish-speaking	5,410 (17.3)	4,276 (14.6)	2,407 (11.3)
Hispanic and English-speaking	2,950 (9.4)	3,099 (10.6)	2,367 (11.1)
Non-Hispanic, non-white, English-speaking	3,590 (11.5)	3,335 (11.4)	2,392 (11.2)
Other	2,915 (9.3)	2,728 (9.3)	1,980 (9.3)
Urbanicity <sup>b</sup>			
Urban	17,883 (57.1)	16,563 (56.7)	12,038 (56.3)
Rural	13,423 (42.9)	12,659 (43.3)	9,352 (43.7)
Income as % of FPL			
<100% FPL	17,720 (56.6)	17,107 (58.5)	15,594 (72.9)
≥100%FPL	13,586 (43.4)	12,115 (41.5)	5,796 (27.1)
≥ 1 Healthcare visit at an OCHIN CHC			
Yes	7,587 (24.2)	6,544 (22.4)	4,428 (20.7)
No	23,719 (75.8)	22,678 (77.6)	16,962 (79.3)

FPL=Federal Poverty Level; CHC=Community Health Center

Both Medicaid and the Children's Health Insurance Program are covered by the Oregon Health Plan

Age groups were not mutually exclusive; see appendix for the complete breakdown of age cohort inclusion

<sup>a</sup>Non-Hispanic, non-white, English-speaking= non-Hispanic and Asian/Pacific Islander, American Indian/Alaska Native, Black, or unknown race, and English-speaking

Other= unknown ethnicity of any race and/or language other than Spanish or English, Non-Hispanic, white and unknown/other language, or unknown ethnicity with unknown/other language

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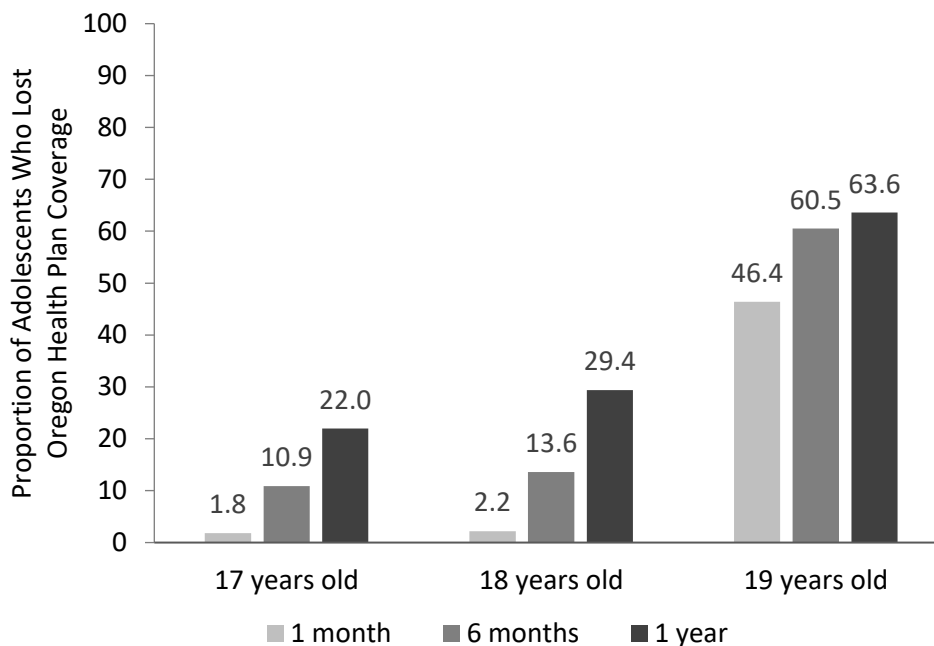
<sup>b</sup>Urban/rural status from zip code of record closest to each birthday

### OHP Coverage

As shown in Figure 1, each year of advancing age—moving from 17<sup>th</sup>, 18<sup>th</sup>, and 19<sup>th</sup> birthdays—resulted in an increased likelihood of OHP coverage loss, as estimated by Kaplan-Meier life table analysis. Within six months of their 19<sup>th</sup> birthday, 60.5% of adolescents had lost OHP coverage, while 39.5% maintained it. Findings were similar within one year of their 19<sup>th</sup> birthday; 63.6% lost OHP coverage, while 36.4% maintained it.

For 19 year olds seen at an OCHIN CHC during the study period (n=4428), 27.4% remained continuously OHP insured for *two years* after turning 19 years of age. Of those who lost coverage, only 1.3% regained OHP, while the majority had no further visits (59%) for two years following coverage loss (data not shown).

**Figure 1.** Proportion of Oregon adolescents who lost Oregon Health Plan coverage within one month, six months, and one year of birthday, by age



Estimates from Kaplan-Meier life table analysis

Both Medicaid and the Children's Health Insurance Program are covered by the Oregon Health Plan

Age groups were not mutually exclusive; see appendix for the complete breakdown of age cohort inclusion

### OHP Coverage across Sociodemographic Characteristics

Among 17 and 18 year olds, OHP coverage loss was highest among non-Hispanic, non-white, English-speaking adolescents [17 year olds=aHR: 1.09, 95% confidence interval (CI): 1.01-1.18; 18 year olds=aHR: 1.13, 95% CI: 1.05-1.21] and lowest among Hispanic and/or Spanish-speaking adolescents (17 year olds=aHR: 0.60, 95% CI: 0.55-0.65; 18 year olds=aHR: 0.70, 95% CI: 0.64-0.75) relative to non-Hispanic white, English-speaking adolescents. As compared to their

female counterparts, 18 (aHR: 1.09, 95% CI: 1.04-1.14) and 19 (aHR: 1.23, 95% CI: 1.19-1.27) year old males were more likely to experience OHP coverage loss.

For 19 year olds, Hispanic/Spanish-speakers (aHR: 1.46, 95% CI: 1.36-1.52) and those with unknown ethnicity and/or language other than Spanish or English (aHR: 1.35, 95% CI: 1.28-1.43) were more likely to lose OHP coverage than were non-Hispanic, white, English-speakers. Nineteen year olds living in households earning  $\geq 100\%$  FPL (aHR: 0.95, 95% CI: 0.92-0.99) were less likely to lose OHP coverage as compared to those households earning  $< 100\%$  FPL. Across all age groups, adolescents who did not receive healthcare at an OCHIN CHC were more likely to experience OHP coverage loss compared to those who did receive care at an OCHIN CHC (17 year olds=aHR: 1.35, 95% CI: 1.26-1.44; 18 year olds=aHR: 1.34, 95% CI: 1.26-1.42; 19 year olds=aHR: 1.26, 95% CI: 1.21-1.32).

**Table 2.** Adjusted Hazard Ratios from Cox Regression Multivariable for time to Oregon Health Plan Coverage Loss by Age, Among Oregon Adolescents 17-19 Years

Adolescent Characteristics	Adjusted Hazard Ratios (95% Confidence Intervals)		
	17 Year Olds n=31,306	18 Year Olds n=29,222	19 Year Olds n=21,390
Sex			
Female (ref)	1.00	1.00	1.00
Male	1.01 (0.96-1.07)	<b>1.09 (1.04-1.14)</b>	<b>1.23 (1.19-1.27)</b>
Race/Ethnicity/Language <sup>a</sup>			
Non-Hispanic, white, English-speaking (ref)	1.00	1.00	1.00
Hispanic and/or Spanish-speaking	<b>0.60 (0.55-0.65)</b>	<b>0.70 (0.64-0.75)</b>	<b>1.46 (1.36-1.52)</b>
Hispanic and English-speaking	<b>0.80 (0.73-0.87)</b>	<b>0.83 (0.76-0.90)</b>	0.98 (0.92-1.04)
Non-Hispanic, non-white, English-speaking	<b>1.09 (1.01-1.18)</b>	<b>1.13 (1.05-1.21)</b>	0.99 (0.93-1.05)
Other	<b>0.83 (0.75-0.91)</b>	<b>0.88 (0.81-0.96)</b>	<b>1.35 (1.28-1.43)</b>
Urbanicity <sup>b</sup>			
Urban (ref)	1.00	1.00	1.00
Rural	<b>0.94 (0.89-0.99)</b>	0.99 (0.94-1.04)	1.01 (0.97-1.04)
Income as % of FPL			
$< 100\%$ FPL (ref)	1.00	1.00	1.00
$\geq 100\%$ FPL	<b>1.17 (1.12-1.24)</b>	<b>1.12 (1.07-1.17)</b>	<b>0.95 (0.92-0.99)</b>
$\geq 1$ Healthcare visit at an OCHIN CHC			
Yes (ref)	1.00	1.00	1.00
No	<b>1.35 (1.26-1.44)</b>	<b>1.34 (1.26-1.42)</b>	<b>1.26 (1.21-1.32)</b>

Ref=reference; FPL=Federal Poverty Level; CHC=Community Health Center

Both Medicaid and the Children's Health Insurance Program are covered by the Oregon Health Plan

Age groups were not mutually exclusive; see appendix for the complete breakdown of age cohort inclusion

<sup>a</sup>Non-Hispanic, non-white, English-speaking= non-Hispanic and Asian/Pacific Islander, American Indian/Alaska Native, Black, or unknown race and English-speaking

Other= unknown ethnicity of any race and/or language other than Spanish or English; Non-Hispanic, white and unknown/other language; and unknown ethnicity with unknown/other language

<sup>b</sup>Urban/rural status from zip code of record closest to each birthday

BOLD signifies statistical significance at  $p < 0.05$ .

## DISCUSSION



While 17- and 18-year old Oregon adolescents lost OHP coverage at similar rates, 19-year olds lost coverage at much higher rates. These findings are similar to previous studies and underscore the vulnerability of adolescents as they age *out* of child public health insurance coverage and may not be able to obtain coverage as adults.(Heberlein et al., 2012; Henry J. Kaiser Family Foundation, 2010; Nicholson & Collins, 2009; Nicholson et al., 2009) These findings also agree with past studies that describe the challenges adolescents face as they transition to their own healthcare management and suggest additional support is critical for a seamless transition.(Harrington, 2015; Neinstein & Irwin, 2013; Sharma et al., 2014)

Interestingly, we found that more than 35% of adolescents remained insured one year (and almost 30% of adolescents seen in OCHIN CHCs remained insured for two years) following their 19<sup>th</sup> birthday. Also, 19-year-olds seen in OCHIN CHCs and those living in families earning  $\geq 100\%$  FPL were less likely to lose OHP coverage as compared to those not seen in OCHIN CHCs and those living  $< 100\%$  FPL. Lastly, 19-year old Hispanics were more likely to lose coverage, which could imply that they may be less likely to be eligible for OHP as adults. Our findings suggest that the support many CHCs offer to help their patients maintain insurance coverage may be having an impact, especially during the important transition period from adolescence to adulthood. For example, OCHIN CHCs employ enrollment specialists who educate current patients about potential health insurance programs and help enroll patients into appropriate programs through application assistance and follow-up.(Hall et al., 2017) Further work is needed to study the insurance support offered by CHCs in more detail to determine the extent to which they are playing a key role in ensuring coverage stability. More research is also needed to better understand why 19 year olds with higher incomes were less likely to lose OHP coverage.

The ACA offers increased access to health insurance including expansion of Medicaid eligibility to adults with household earnings  $\leq 138\%$  FPL. Therefore, the drop off from Medicaid at age 19 should be lower now than at the time this study was conducted, especially since Oregon chose to expand Medicaid.(Henry J. Kaiser Family Foundation, 2015) Differences in loss of Medicaid coverage for adolescents will be variable across the US and eligibility criteria are usually more generous for CHIP. For example, more than half of US states now cover children in families with incomes  $\leq 250\%$  FPL and many cover them at  $\leq 300\%$  FPL.(Henry J. Kaiser Family Foundation, 2014) These differences in eligibility criteria will likely continue to be problematic for adolescents transitioning to young adulthood.(Medicaid.gov, 2015)

The findings from this study should be considered within the context of several limitations. Our study population was limited to adolescents from Oregon. While our sample represented a large number of Oregon adolescents, our findings may not be generalizable to other states especially since states vary in income eligibility requirements for CHIP and Medicaid and implementation of programs to increase or streamline enrollment.(Heberlein et al., 2012) Analyses employed in this study were exploratory. As such, further research is warranted to pinpoint contributing factors associated with health insurance loss and maintenance across the transition from child to adult coverage. Data used in this study were observational and as a result associations observed do not prove a causal relationship. It will be important to repeat this type of analysis in the years following ACA implementation and compare similar cohorts of adolescents residing in states that did and did not expand Medicaid coverage. Data on whether those who lost OHP coverage obtained other health insurance were not available. However, previous research showed only about 10% enrolled in private health insurance after losing public coverage at age 19 (Henry J. Kaiser Family Foundation, 2010) and more recent data found a 7% increase in uninsured rates

when adolescents turned 19 years of age (U.S. Centers for Medicare & Medicaid Services, 2016) suggesting that young adults who are no longer eligible for CHIP are becoming uninsured. Lastly, data on the mechanism of churning (such as change in employment, economical, and educational situation) of those in our study was not available. Future research is needed to understand the reasons associated with losing or gaining health insurance in this group.

## CONCLUSION

Nineteen-year-old Oregon adolescents lost public health insurance coverage at higher rates than 17- and 18-year olds, yet >35% of 19 year olds kept their coverage for up to one year after their 19<sup>th</sup> birthday. Our findings suggest that the support many community health centers offer to help their patients maintain insurance coverage may be having an impact, especially during this important transition period. Additional research to understand how these 19 year olds were able to keep coverage will provide recommendations for future adolescents as they transition to young adulthood.

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**Appendix.** Sample sizes for each age group

Mutually Exclusive Groups	N	%
Age Group 17 Only	14,096	27.1
Age Groups 17 and 18	9,702	18.7
Age Groups 17 and 19	1,019	2.0
Age Groups 17, 18, and 19	6,489	12.5
Age Group 18 Only	6,800	13.1
Age Group 18 and 19	6,231	12.0
Age Group 19 Only	7,651	14.7
Total	51,988	100.0
Non-Mutually Exclusive Groups		
Age 17	31,306	60.2
Age 18	29,222	56.2
Age 19	21,390	41.1
Total	51,988	100.0