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I. Sampling Methodology

This section outlines the sampling process used during the 2017 Oregon Health Insurance Survey (OR HIS). The sampling process consisted of two stages including 25 geographic strata and an over sample based on race.

The separate document **OHA Oregon Health Insurance Survey 2017 Sampling Plan** is the guiding document for sampling protocols for the 2017 Oregon Health Insurance Survey.

Initial discussion on sampling occurred on December 20, 2016 with a draft sampling plan submitted to OHA for review on January 9, 2017. The final approved sampling plan was submitted to OHA on February 6, 2017.

Target Population

The target population for the 2017 OR HIS consisted of all persons in families living in the state of Oregon. Persons residing in group homes with nine or more persons, group quarters such as dormitories, military barracks and institutions, and those with no fixed household address (i.e., the homeless or residents of institutional group quarters such as jails or hospitals) were excluded from this survey¹. In addition, the sample excluded non-permanent residences and vacation residences (qualified households will be considered those in which someone resided at least six months of the year).

Since the sampling approach relied on the use of a landline and cell phone sample, the sample population only included those households (and residents therein) with working telephones.

Sample Definition

The goal of the sampling approach was to obtain statewide population information on health insurance status, health care usage and access, barrier to care and other demographic and health variables. The sampling protocols relied on a two-stage design:

- During the first stage, the sampling methodology was based on a dual frame RDD design that included both randomly selected listed landline and random digit dial (RDD) cell phone numbers. Sampling at this stage was done within 25 geographic strata.
- During the second stage, an over sample was drawn from listed land line and cell phone numbers that targeted African American and Asian residents.

Overall, the target was to complete surveys with 9,000 Oregon households.

Based on estimates of the cell phone penetration among the target population, the goal was to complete approximately 67% of the surveys via cell phone and 33% via landline.

¹ The initial screening will code as ineligible such group quarters. In this survey, group quarters' telephone numbers were considered those where a number of unrelated people living in more than one "unit" relied on the same telephone. An example of a unit in this case might be a fraternity house where all those residing in the house use the same phone.

Sample Stratification and Race/Ethnic Minority Oversample

In prior administrations of the OR HIS, sampling included fifteen distinct geographic regions. In consultation with OHA, MDR further divided the regions into a total of 25 sub-regions, each sub-region made up of counties comprising at least 20,000 residents in total. Each of these sub-regions is contained completely within one of OHA's existing regions.

The proposed number of surveys within each of the 25 sub-regions is summarized in Table 1. The sampling plan set a minimum number of surveys to complete within each of the 25 strata, totaling to 8,150 surveys. The remaining 850 surveys (to reach the total of 9,000) were set aside in order to meet targets for completed surveys among African American, Asian, Hispanic, and Native American Households. These targets are presented in Table 2.

Sample Generation

All the landline and cell phone samples used for this project were generated by Marketing Systems Group. This included:

- Random listed landline sample for each of the 25 geographic strata
- RDD cell phone sample for each of the 25 geographic sample strata
- A listed landline sample targeting African American households
- A listed landline sample targeting Asian households
- A listed cell phone sample targeting African American households
- A listed cell phone sample targeting Asian households

In all, a total of 201,648 telephone numbers were generated for use in the survey.

Table 1: Target Surveys by Sub-Region

Strata	County	Sample Minimum
1	Union, Wallowa, Baker	250
2	Umatilla	250
3	Morrow, Wheeler, Sherman, Gilliam, Grant, Crook	250
4	Wasco	250
5	Jefferson	250
6	Hood River	250
7	Malheur, Harney, Lake	250
8	Klamath	250
9	Deschutes	400
10	Clatsop, Tillamook	250
11	Lincoln	250
12	Columbia	250
13	Benton	250
14	Linn	300
15	Lane	500
16	Curry, Coos	250
17	Josephine	250
18	Jackson	400
19	Douglas	300
20	Marion	500
21	Polk	250
22	Yamhill	300
23	Multnomah	600
24	Clackamas	500
25	Washington	600
	<i>Surveys Assigned to Sub-Regions</i>	<i>8,150</i>
--	Additional Oversample Surveys	850
	Total Surveys	9,000

Table 2: Target Surveys by Racial/Ethnic Category

Survey Group	Rate in Population	Target for Household Surveys
Black or African American	2.7%	300
American Indian and Alaska Native	3.0%	300
Asian	5.4%	300
Hispanic or Latino (of any race)	12.3%	700

Sample Screening: Surveys with Residents Aged 65 and Older

A consistent issue with broad based telephone surveys is overrepresentation of older Americans. For a number of reasons individuals aged 65+ are more likely to answer telephone surveys, crowding out resources that could be dedicated toward completing surveys with more varied groups of respondents. The sampling protocols included steps to help reduce the number of households containing only individuals aged 65 with the goal to keep the rate of those 65 and older completing the survey close to that actual percentage in Oregon (about 16.5%). These step included:

- An initial pre-screen of all listed landline sample to identify households with residents age 65 and older. The prescreening was based on demographic information appended to each landline record about the age of the head of the household.
- An initial pre-screen of all RDD Cell sample to identify households with residents age 65 and older. The prescreening was based on demographic information, when available, appended to each cell phone record about the age of the cell phone owner. In all, age information was available for 12% of RDD cell phone records
- All cell phone records which identified the cell phone owner as 65 or older were removed from the sample prior to calling.
- For the landline sample, sample replicates entered for calling from the beginning of data collection (on March 11, 2017) until 4/25/2017 had 50% of the records for which the head of household was 65 or older removed prior to calling.
- For the landline sample, sample replicates entered for calling from 5/30/2017 until 6/16/2017 had 100% of the records for which the head of household was 65 or older removed prior to calling.

Additionally, sample was screened with a pre-interview question. Individuals answering 'no' when asked if any individuals in their household were under the age of 65 were considered ineligible and did not complete the survey. The percent of individuals asked this question was adjusted as data collection progressed in response to the rate of individuals over the age of 65 appearing in the data. Refer to Table 3 for dates at which interview screens were increased, and the rate of screening implemented. No interviews prior to 4/11/2017 were screened.

Table 3: Dates of Survey Screening Changes

Date of screen increase	Rate of screen
4/11/2017	30%
6/28/2017	70%
7/8/2017	100%

II. Questionnaire Design

The survey questionnaire used during the course of the 2017 OR HIS was based on the prior 2015 OR HIS as well as questions used in surveys conducted in other states by Market Decisions Research.

The initial steps in survey design focused on a review of the prior 2015 ORHIS instruments. For the second stage of the review, Market Decisions Research (MDR) provided a series of questions by topic area that had been included in other state health insurance surveys.

On January 23, 2017 OHA provided an initial list of possible changes to MDR for review prior to the survey development meeting. On the same day, MDR prepared a survey instrument discussion document that included questions from the 2015 OR HIS along with potentially new times to add from other state health insurance surveys.

A survey development meeting was held on January 26 and 27, 2017 to review the list of possible changes and the survey instrument discussion document. A draft document was developed to serve as the guide for the 2017 OR HIS. This was modified based on feedback provided on January 30, 2017 which included the final list of survey deletions and changes.

An initial draft of the survey instrument was submitted to OHA on September 9, 2017. This survey was programmed and used during the pre-test of the survey which occurred between February 16 and February 25, 2017. Based on the pre-test, a final list of survey changes and deletions was incorporated into the survey. A copy of the pre-test report is provided as a separate document **2017 OR HIS Survey Pre-test Report**.

The final survey was approved by OHA on March 8, 2017. Once the survey was finalized, it was translated into Spanish to allow for bilingual interviewing. Translation of the survey was completed by March 11, 2017. The basic components of the 2017 survey gathered information from Oregon residents in the following areas:

1. Household characteristics
2. Demographic characteristics of each household member
3. Relationships between household members
4. Type of health insurance coverage
5. Private health insurance coverage characteristics
6. CCO enrollment among those covered under the OHP
7. Characteristics of the uninsured
8. Barriers to enrolling in health insurance among the uninsured
9. Interruptions in insurance coverage
10. Changes in insurance coverage
11. Health literacy
12. Dental insurance
13. Dental care
14. Access to and use of health care
15. Use of prescription drugs
16. Health care expenditures
17. Barriers to receiving health care
18. General health status and disabilities
19. Employment characteristics

- 20. Access to and enrollment in employer sponsored health insurance
- 21. Income (family level)

Changes after data collection

There were two changes made to the survey during data collection:

A prompt was added to the variable asking the respondent to provide the number of people living in the household. The prompt was added to reassure respondent's that the information they provided was confidential.

The two questions that assessed gender and gender identify were changed to more accurately gather data on current gender identity.

Complete copies of the English and Spanish versions of the survey are provided as separate documents:

- **Final 2017 OR HIS - Short Version (includes question text only and not response categories)**
- **Final 2017 OR HIS Survey English Version (includes response categories)**
- **Final 2017 OR HIS Survey English and Spanish Version (includes response categories)**

Survey specifications used to train interviewers are also provided in a separate document: **2017 ORHIS Survey Specifications.**

Family Formation

One important concept that was incorporated into the 2017 OR HIS was that of family units. This concept is important because of the relationship between variables such as private or governmental insurance coverage and family level characteristics such as income. The survey logic was designed so that all members of a household were grouped into family units based upon their relationships. The survey was structured to ask the questions about each family unit separately.

Family units were identified by establishing the relationship of each member of the household to the identified head of the household. This was done by first collecting the number of people in the household and a name or other identifier for each person. The household was then rostered and basic demographic information was gathered on each household member (age, gender, marital status, ethnicity, race, level of education, and where the resident was born). The respondents were then asked to describe the relationship of each member of the household to the head of the household. Two follow-up questions then clarified marital relationships between household members besides the head of household and their spouse and any guardian/ward relationships. Based upon this sequence of questions, household members were classified into family units. In general, the rules to assign members to family units were:

1. The head of the household and his/her spouse were classified in the same family unit (always family unit 1)
2. Adults aged 19 and older who were not married to the head of household were classified as a separate family unit

3. Adults aged 18 were initially classified as a separate family unit. An assessment was later made to determine if they should be classified into the same family unit as their parents (see below)
4. Married couples were classified in the same family unit. This included married couples involving someone under age 17
5. Children aged 17 and younger were classified in the same unit as their parent(s)/guardians. If their parent(s) or legal guardian did not live in the household, they were considered a separate family unit. With the exceptions that:
 - Children aged 17 and younger were classified into a separate family unit from their parents in cases where they were married and/or had a child of their own, no matter their residence
6. Adults that were age 18 were classified into a family unit based upon whether they were currently living with their parents, were married and/or had children. If they were not married and did not have any children, they were classified in the same family unit as their parents (if living in the same household). If they were married and/or had a child of their own, they were classified as a separate family unit (with their spouse and/or child)
7. Finally, those who were identified as the ward of another household member were classified in the same unit as that household member, unless prior rules determined the ward should be classified separately

III. Data Collection

The data collection phase of the 2017 OR HIS began on March 11, 2017 and was completed by August 29, 2017. A total of 9,007 households were interviewed during this period.

To meet response rate requirements for this study a rigorous data collection strategy was used in conducting this survey. This included the following:

- Rotation of call attempts across all seven days at different times of the day according to industry standards for acceptability and legality in telemarketing

For Landline Phones:

- Up to of 10 callback attempts per telephone number.
- 2 attempts to convert refusals (the exception were those households that made it clear they were not to be contacted again)
- A brief message with a toll-free number was delivered to answering machine only attempts to encourage participation (messages were left on the first answering machine dispositions)

For Cell Phones

- Up to 6 callback attempts per telephone number.
- 1 attempt to convert refusals (the exception were those households that made it clear they were not to be contacted again).
- A brief message with a toll-free number was delivered to answering machine only attempts to encourage participation (messages were left on the first answering machine dispositions)

For the oversample of African American and Asian households

- Up to 15 callback attempts per telephone number for landline numbers
- Up to 10 callback attempts per telephone number for cell phone numbers
- Began calling ethnic/racial minority over samples 5/12/2017

Per industry standards, interviews were only conducted during the hours from 9 AM to 9 PM and seven days a week. The only exceptions were specific, scheduled appointments outside this range.

Scheduling Callback Appointments

The CATI (Computer Assisted Telephone Interviewing) system used by MDR during the course of this survey is designed to allow interviewers to set callback appointments for a specific date and time. It is also designed to allow a respondent who has begun the survey and cannot complete it to complete it at a later time. This is done so that the respondent can complete the survey at a time that is most convenient for him or her. The interviewer enters the date and time the respondent provides and the respondent is then contacted at that time. Over the course of the data collection phase, 41,002 scheduled appointments were made.

Survey Length

The 2017 OR HIS required respondents to provide a great deal of information about themselves and other family members. The goal was to obtain accurate information about all household members while limiting the time commitment required of the respondent.

On average, the survey required 29.6 minutes and 61% percent of the interviews were completed in 30 minutes or less. The shortest amount of time required was 11 minutes while the longest survey required 83 minutes.

Exclusion of Household Members

In multiple-family households, it was expected that there would be cases where the respondent would not be able to provide accurate data on every person living in the household. During the course of the survey, the respondent was asked to identify any household member for which he/she could not provide accurate information. During the interview, the respondent was not asked questions relating to these individuals.

In cases where the respondent could not provide information about the type of health insurance coverage for another household member, the respondent was also not asked the remaining survey questions relating to these individuals.

In all, 1,211 people were excluded during data collection or 5.4% of all household members.

Data from excluded individuals is not included in the final data set provided to OHA.

IV. Survey Response Rates and Final Dispositions

The response, cooperation, and refusal rates to the 2017 OR HIS Insurance Survey are presented in Table 4 for the survey as a whole, for the random listed landline, the RDD cell phone, and the over sample of African American and Asian households.

The rates reported are based on the standard formulas developed by the American Association for Public Opinion Research (AAPOR). The reported response rate is based on AAPOR RR3 formula.

This final sample disposition report is presented in Table 5. It reports dispositions for the survey as a whole, as well as separately for each sampling strata.

Table 4: Summary of Response, Cooperation, and Refusal Rates by Survey Component and Strata

	Response Rate	Respondent Cooperation Rate	Respondent Refusal Rate
Landline	21.7%	46.4%	25.5%
Cell Phone	8.8%	41.0%	18.1%
Over Sample	13.9%	40.4%	20.9%
Total	13.4%	42.5%	20.7%

Table 5: Final Sample Disposition Codes

	Cellphone Sample	Landline Sample	Over Sample	Total
Eligible, Interview (Category 1)				
Complete*	4,992	2,686	1329	9,007
Partial (Call Back)	334	43	82	459
Eligible, Non-interview (Category 2)				
Refusal and breakoff (Partial Terminate)	579	215	167	961
Household-level refusal	8,508	2,950	1712	13,170
Known respondent refusal	492	166	106	764
Scheduled Callback	792	78	67	937
Respondent never available	175	65	34	274
Telephone answering device	30,249	4,228	4338	38,815
Physically or mentally unable/incompetent	52	29	4	85
Language problem	275	66	284	625
Unknown eligibility, non-interview (Category 3)				
Always busy	659	192	98	949
No answer	5,528	1,000	879	7,407
Call blocking	2,573	478	229	3,280
Hang-up	5,075	1,385	731	7,191
No screener completed, residential and live contact made	648	77	69	794
Not eligible (Category 4)				
Fax/data line	125	1,905	164	2,194
Non-working/disconnect	14,280	10,376	3418	28,074
Non-working number	5,633	2,011	634	8,278
Temporarily out of service	3,014	534	265	3,813
Number changed	265	117	14	396
Cell phone < 18	701	48	42	791
Pager	22	18	5	45
Nonresidence				0
Business, government office, other organizations	2,230	3,019	323	5,572
Institution or Group Quarters	96	37	32	165
No eligible respondent	1,364	1,043	177	2,584
Other	4,035	2,763	730	7,528
				0
Not an eligible residence	2,282	237	244	2,763
Total sample used	94,978	35,766	16,177	146,921

Table 6: Summary Dispositions

	Cellphone Sample	Landline Sample	Over Sample	Total
I=Complete Interviews (1.1)	4,992	2,686	1,329	9,007
P=Partial Interviews (1.2)	334	43	82	459
R=Contact, refusal and break off with eligible case (2.1)	10,371	3,409	2,052	15,832
NC=Non-contact with eligible case (2.2)	30,424	4,293	4,372	39,089
O=Other non-interview with eligible case (2.0, 2.3)	327	95	288	710
UH=Unknown if residential (3.0, 3.1)	8,760	1,670	1,206	11,636
UO=Unknown other (3.2, 3.9) (residential, unknown if eligible)	5,723	1,462	800	7,985
INNR = Ineligible: Not residential (4.0,4.1,4.2,4.3,4.4,4.5,4.8,4.9)	29,700	20,780	5,585	56,065
INR=Ineligible: Residential but ineligible for survey (4.7)	4,347	1,328	463	6,138
Total	94,978	35,766	16,177	146,921

V. Total Interviews

A total of 9,007 households were contacted and interviewed. The final data includes data on 21,329 Oregon residents. The final dataset also contains data from 1,186 uninsured Oregon residents.

A total of 5,754 surveys were completed via cell phones and 3,253 were completed via landline phone interviews.

A total of 270 interviews were completed in Spanish.

A breakdown of surveys by strata is presented in Table 6 along with the number of over sample interviews among African American and Asian sample (broken out by strata).

Table 7: Number of Completed Surveys

Strata	County	Cell Phone	Land line	Total	Over Sample
1	Union, Wallowa, Baker	177	90	267	24
2	Umatilla	148	95	243	31
3	Morrow, Wheeler, Sherman. Gilliam, Grant, Crook	205	95	300	20
4	Wasco	188	77	265	10
5	Jefferson	133	112	245	7
6	Hood River	190	57	247	11
7	Malheur, Harney, Lake	158	111	269	9
8	Klamath	164	79	243	28
9	Deschutes	322	94	416	33
10	Clatsop, Tillamook	165	100	265	32
11	Lincoln	149	88	237	25
12	Columbia	124	118	242	26
13	Benton	202	116	318	25
14	Linn	218	148	366	45
15	Lane	344	232	576	110
16	Curry, Coos	151	120	271	46
17	Josephine	193	91	284	34
18	Jackson	309	167	476	71
19	Douglas	214	131	345	41
20	Marion	342	193	535	106
21	Polk	169	123	292	48
22	Yamhill	167	127	294	34
23	Multnomah	521	252	773	199
24	Clackamas	317	233	550	150
25	Washington	484	204	688	169
Total		5,754	3,253	9,007	1,334

VI. Data Cleaning

A detailed description of the data cleaning process is provided in the separate document **OHA Oregon Health Insurance Survey 2017 Analytical Plan** on pages 10 to 15. The final analytical plan was provided to OHA on January 31, 2017.

Data cleaning and file preparation was conducted between June 12 and June 23, 2017 for the midpoint data set and between August 30 and September 15, 2017 for data gathered during the second half of data collection.

The purpose of the mid-point data cleaning and preparation was to prepare a file to verify that all variables were present in the data file, variable formats, and variable labels. A copy of the mid-point data set was provided to OHA on 6/23/2017. The process of data cleaning and preparation was then repeated on data gathered following the mid-point of data collection. Once complete, this file was then merged with the mid-point data set.

VII. Data Imputation

A detailed description of the data imputation process is provided in the separate document **OHA Oregon Health Insurance Survey 2017 Analytical Plan** on pages 15 to 17. The final analytical plan was provided to OHA on January 31, 2017.

The variables that include imputed values and the method of imputation are summarized in Table 7.

Table 8: Imputed Variables and Methods

Variable	Label	Method of Imputation
ngend	What was person's sex at birth?	Hot Deck
Age1	What is person's age?	Hot Deck
ethn	Is person of Hispanic, Latino, or Spanish origin?	Logical and Hot Deck
prace	Which of the following would you say is person's race?	Logical and Hot Deck
Emp06	On this job, is person employed by a private company or business or a government agency?	Logical
emp09	About how many people work for this employer, at all locations?	Logical and Hot Deck
Income	2016 annual family income	Regression Based
Exp01, exp02, exp02a, exp03	Medical Expenditures	Regression Based
Insp20	What is the monthly premium paid for person's health insurance?	Regression Based
Insp25	How much is the deductible for everyone covered under this health insurance?	Regression Based
Ndocv2a	How many times did person see a specialist during the past 12 months?	Logical and Regression Based
Care4	How often did person's provider seem informed and up-to-date about the care received from specialists?	Logical and Regression Based

VIII. Data Weighting

A detailed description of the weighting process is provided in the separate document **OHA Oregon Health Insurance Survey 2017 Analytical Plan** on pages 18 to 23. The final analytical plan was provided to OHA on January 31, 2017.

Note: based on the data available through the ACS, changes made to the raking adjustments in order to increase the accuracy of the data. The complete list of raking adjustments and values for each category are presented in Table 8.

The data has been weighted to adjust for non-response and also to match the state profile based upon sex, age, race, ethnicity, area of residence, and income. Weighting adjustments were also made for households based upon their access to landlines, cell phones, or both. Finally, adjustments were made to align survey counts of OHP and health Exchange enrollees with administrative counts.

The weighting procedures involved two primary phases: design weights and raking weighting adjustments.

Market Decisions Research developed design weights based on the probability of selection within a frame with an adjustment for those potentially in two frames. Additionally, MDR incorporated a weighting adjustment for the cell phone only population.

An initial sample weight was assigned to each record in the sample file. This base weight was equal to the inverse of the probability of selecting a number within each of the sampling strata. An adjustment was made to this design weight if there was the possibility they were included in both the landline component and the cell phone component. The final design weight was:

1. Equal to the base weight for those that only had a landline telephone (determined during data collection)
2. Equal to the base weight for those that only had a cell phone (determined during data collection)
3. Equal to twice the base weight for those that had both a landline and a cell phone (determined during data collection)

The base weight of each over sample record was the inverse of the probability of selecting a number from all numbers available.

Raking Weighting Adjustments

The purpose of raking is to standardize the weights so they sum to the actual population within Oregon as well as summing to the population by area, age, gender, race, ethnicity, income, and whether the household was a cell phone only household. Raking adjustments were made by these various demographic characteristics.

Demographic data on population counts was developed from American Community Survey (ACS) single year estimates, from the US Census Bureau. The data for the cell phone only population was provided by Marketing Systems Group, which provided estimates of cell phone only households for each Oregon county.

An initial review of survey and census data was conducted to determine the appropriate steps in the weighting process. The general guideline in post-stratification weighting is that no cell should have fewer than 20 cases. The initial post-stratification weighting was done in six steps:

- County of residence
- Age by gender by region of the state
- Ethnicity by age by gender
- Race by age by gender
- Family income by age
- Presence of cell phone only within the household by sampling strata

A summary of the demographic adjustments is presented in Table 8.

Post Stratification Weighting Adjustments for Enrollment in Medicaid and Other State Sponsored Programs

An issue that is common in all studies that try to measure health insurance coverage is that the population enrolled in Medicaid and other state health insurance programs is generally undercounted. There are a number of reasons that might account for this, such as a greater difficulty in reaching these populations given their lower incomes, and reluctance among some respondents to report enrollment in such programs. After weighting by the demographic characteristics, the survey results we analyzed to determine if the survey data reflected:

In order to determine the potential for an undercount of Medicaid in the survey data, an analysis was undertaken using available administrative data on program enrollees. Based on administrative data, a total of 1,041,020 Oregon residents were enrolled in the Oregon Health plan and 130, 834 were enrolled in a health plan obtained through the Exchange.

Comparing this analysis to the final data, with corrected demographic weights applied, showed an undercount in residents enrolled in the Oregon Health Plan was present, though small in comparison to other surveys of this nature. An undercount of those enrolled in a health plan obtained through the Health Exchange was also present. After adjusting the data based on demographics, the survey estimate of the population enrolled in OHP was 1,026,002 Oregon Residents. This represents an undercount of 1.4%.

The survey estimate of the number of enrollees in Health Exchange health plans was 115,498, or an undercount of 12%.

Given the slight undercount in the OHP population and the larger undercount among those on Exchange plans, the data was weighted to adjust for these undercounts so that the survey counts would more match the counts in administrative data. The process added raking adjustments

- By enrollment in a health plan obtained through the Health Exchange
- By enrollment in OHP by age by gender
- By enrollment in OPH by region

Table 9: Demographic Characteristics Used in Raking Adjustments

Adjustment	Variable Values		
County of residence	Oregon Counties		
	See Appendix 1		
Age by gender by region of the state	Age	Gender	Region
	0 to 9	Female	See Appendix 1
	10 to 18		
	19 to 24		
	25 to 34		
	35 to 49	Male	
	50 to 64		
	65+		
Ethnicity by age by gender	Age	Gender	Ethnicity
	0 to 9	Female	Hispanic
	10 to 18		
	19 to 24		
	25 to 34		
	35 to 49	Male	Non-Hispanic
	50 to 64		
	65+		
Race by age by gender	Age	Gender	Race
	0 to 18	Female	White alone
			Black or African American alone
			American Indian or Alaska Native alone
	19+	Male	Asian alone
			Native Hawaiian, Other Pacific Islander, other race, 2+ race
Family income by age	Age	Income (% FPL)	
	0 to 9	0% - 100% FPL	
	10 to 18	101% - 138% FPL	
	19 to 24	139% - 200% FPL	
	25 to 34	201% - 300% FPL	
	35 to 49	301% - 400% FPL	
	50 to 64	401%+ FPL	
	65+		
Presence of cell phone only within the household by sampling strata	Sampling strata	Is Household Cell Phone Only?	
	See Appendix 1	Yes	
		No	

Table 10: OHP and Health Exchange Undercount Raking Adjustments

Adjustment	Variable Values		
Enrolled in Health Exchange Plan	Source of Private insurance Health Exchange Some other source		
OHP enrollment by age by gender	Age	Gender	OHP Enrollment
	0 to 9	Female	Enrolled in OHP
	10 to 18		
	19 to 24		Coverage through other insurance
	25 to 34		
	35 to 49	Male	Uninsured
	50 to 64		
	65+		
OHP enrollment by age by gender	Region	OHP Enrollment	Ethnicity
	See Appendix 1	Enrolled in OHP	Hispanic
		Coverage through other insurance	Non-Hispanic
		Uninsured	

The process of raking started from the beginning, making the six demographic adjustments and then the three enrollment adjustments (nine adjustments in total).

The raking process was repeated until the weighting adjustments converged and the weighted counts matched the state demographic profile by age, gender, county of residence, race, ethnic origin, income, enrollment in a private health plan obtained through the Health Exchange, the presence of cell phone only households, as well as enrollment in a Medicaid program.

Population Size Reflected in the Final Dataset

The weighted dataset is designed to provide data that can be generalized to the non-institutionalized population of Oregon (based on ACS estimates) and to allow statements to be made about the state as a whole as well as for various sub-populations with a known standard error and confidence. The population size reflected in the final dataset is 3,993,100 residents.

Appendices

Appendix 1: Sample Strata and Geography

Table 11: Geographic Sample Strata

Strata	County	Sample Minimum
1	Union, Wallowa, Baker	250
2	Umatilla	250
3	Morrow, Wheeler, Sherman, Gilliam, Grant, Crook	250
4	Wasco	250
5	Jefferson	250
6	Hood River	250
7	Malheur, Harney, Lake	250
8	Klamath	250
9	Deschutes	400
10	Clatsop, Tillamook	250
11	Lincoln	250
12	Columbia	250
13	Benton	250
14	Linn	300
15	Lane	500
16	Curry, Coos	250
17	Josephine	250
18	Jackson	400
19	Douglas	300
20	Marion	500
21	Polk	250
22	Yamhill	300
23	Multnomah	600
24	Clackamas	500
25	Washington	600
		8,150

Table 12: OHA Historic Regions

Region	Counties
Region 1	Umatilla, Union, Wallowa, Baker
Region 2	Crook, Gilliam, Grant, Hood River, Jefferson, Morrow, Sherman, Wasco, Wheeler
Region 3	Harney, Klamath, Lake, Malheur
Region 4	Deschutes
Region 5	Clatsop Columbia, Lincoln, Tillamook
Region 6	Benton, Linn
Region 7	Lane
Region 8	Coos, Curry, Josephine
Region 9	Jackson
Region 10	Douglas
Region 11	Marion
Region 12	Polk, Yamhill
Region 13	Multnomah
Region 14	Clackamas
Region 15	Washington

Table 13: County Cross Walk to OHA Region and Sample Strata

County	OHA Region	Sample Strata
Baker	1	1
Union	1	1
Wallowa	1	1
Umatilla	1	2
Gilliam	2	3
Grant	2	3
Morrow	2	3
Sherman	2	3
Wheeler	2	3
Crook	2	3
Wasco	2	4
Jefferson	2	5
Hood River	2	6
Harney	3	7
Lake	3	7
Malheur	3	7
Klamath	3	8
Deschutes	4	9
Clatsop	5	10
Tillamook	5	10
Lincoln	5	11
Columbia	5	12
Benton	6	13
Linn	6	14
Lane	7	15
Coos	8	16
Curry	8	16
Josephine	8	17
Jackson	9	18
Douglas	10	19
Marion	11	20
Polk	12	21
Yamhill	12	22
Multnomah	13	23
Clackamas	14	24
Washington	15	25

Appendix 2: Defining Eligibility for Medicaid or Subsidies through the Exchange

Defining Eligibility for the Uninsured and Potential Eligibility for those with Private Health Insurance

Under the guidelines in the Patient Protection and Affordable Care Act (PPACA), uninsured as well as some privately insured residents are eligible for coverage under the expanded Medicaid program or eligible for some level of premium assistance (tax credits) to assist in purchasing health insurance through the Health Exchange. The new eligibility rules in Oregon extend coverage in the OHP to most adults with incomes under 139% of FPL (including the 5% income offset). Children in families with incomes of 300% of FPL or less would also potentially be eligible for coverage through the OHP.

For those residents that do not meet the income requirements for OHP coverage, the PPACA provides tax credits that reduce premium costs. This includes those in families with incomes up to 400% of FPL. Adults in families with incomes between 139% and 400% of FPL (including a 5% income offset) and children in families with incomes between 301% and 400% of FPL who purchase coverage through the Health Insurance Exchange will be eligible for a tax credit to reduce the cost of coverage that began in 2014.

The amount of the tax credit that a resident can receive is based on the premium for the second lowest cost silver plan in the Exchange. A silver plan is a plan that provides the essential benefits and has an actuarial value of 70%, that is, the plan pays 70% of the cost of covered benefits. Further, the amount of the tax credit will vary by income. Those with a lower family income that purchase insurance through the Exchange will receive a larger tax credit to offset the cost of the health insurance. The tax credits are designed such that an individual or family will not spend more than a specific percentage of their income on health insurance premiums.

Under the guidelines, people eligible for public coverage and people offered coverage through an employer are not eligible for premium tax credits unless the employer's plan does not have an actuarial value of at least 60% or unless the person's share of the premium for employer-sponsored insurance exceeds 9.5% of income. People that meet the thresholds for unaffordable employer-sponsored insurance are eligible to enroll in a health insurance Exchange and may also receive tax credits (based on their family income) to reduce the cost of coverage purchased through the Exchange.

The PPACA also limits the total amount that people must pay out-of-pocket for cost sharing for essential benefits. Currently, the limits are based on the maximum out-of-pocket limits for Health Savings Account-qualified health plans (currently \$7,150 for single coverage and \$14,300 for family coverage).

The tables below provide a summary of these guidelines by family income categories. The first table includes the income thresholds for coverage through the state Medicaid program. The table also provides the guidelines for the percent of income that would not be exceeded in purchasing through the Exchange (above which tax credits cover the cost), based on the second lowest cost silver plan.

The second table provides the maximum out of pocket limits for cost sharing based on the income of the family.

Maximum Out-of-Pocket Premium Payments Under PPACA for 2017

Federal Poverty Level	Maximum Premium under PPACA as a % of Income
Under 139%	Eligible for Medicaid
139% - 149%	3.06% – 4.08%
150% - 199%	4.08% - 6.43%
200% - 249%	6.43% - 8.21%
250% - 299%	8.21% - 9.69%
300% - 400%	9.69%
401% or more	No Premium Subsidy

Maximum Out-of-Pocket Health Care Expenses Under PPACA

Income (% of Federal Poverty Level)	Maximum Health Care Expenses Allowed Under PPACA	
	<i>Individual Plan</i>	<i>Family Plan</i>
100% - 200%	\$2,350	\$4,700
200% - 250%	\$5,700	\$11,400
> 250% FPL	\$7,150	\$14,300

Using these general monthly premium guidelines, survey data were used to model eligibility for OHP or purchasing health insurance through the Exchange among the uninsured. The analyses were based solely on income determinations of eligibility based on self-reported family income. They did not factor in other factors that may impact actual eligibility (such as potential access to other health insurance) or impact income which would affect either eligibility for OHP or the level of subsidy through purchase through the Exchange (such as additional state based income offsets that would reduce income in making determinations of eligibility).

Appendix 3: Defining the Underinsured

Two estimates for underinsured residents in Oregon were calculated. The first of these estimates was originally created by the Commonwealth Fund, and is a widely understood and accepted method of estimating the underinsured. The second method, which we refer to as the Market Decisions Research Model, is an original creation of MDR. Based on the Commonwealth Model, it expands and refines the understanding of what it means to be underinsured in ways we consider critical.

The Commonwealth Fund Model for Calculating the Underinsured

The first measure of underinsurance was based on a formula developed by the Commonwealth Fund. This formula is an attempt to determine individuals who would be financially burdened by medical expenses.

Financial burden, and thus underinsurance, under the Commonwealth Fund formula is determined in two ways: the annual insurance deductible and out-of-pocket medical expenses.

Families are determined to be underinsured if the deductible for their private health insurance exceeds **five percent** of the family's income; thus, a family of four making the Federal Poverty Level (2017) amount of \$24,600 annually could not pay more than \$1,230.00 in annual deductible without being considered underinsured. A family of one making \$24,600 annually with a deductible of more than \$1,230.00 would also be considered underinsured despite being over 300% of FPL.

The second method by which an individual can be determined to be underinsured by the Commonwealth Fund method is via out-of-pocket expenses. To determine the level, the Commonwealth Fund formula first splits families into two groups: those earning 200% of FPL or less, and those earning more than 200% of FPL. Families at or beneath 200% of FPL are considered underinsured if their reported out-of-pocket medical expenses exceed **five percent** of family income. Families making more than 200% of FPL are considered underinsured if their reported out-of-pocket medical expenses exceed **10%** of family income. Using the examples above, a family of four making \$24,600 would be considered underinsured if their medical expenses exceeded \$1,230.00. However, a family of one making \$24,600 would require out-of-pocket medical expenses greater than \$2,460 in order to be considered underinsured.

An individual may be considered underinsured based on deductible, based on medical expenses, or based on both criteria.

The Market Decisions Research Model for Calculating the Underinsured

In order to understand the need for the MDR Model it is important to draw a distinction between direct and indirect measures. The Commonwealth Fund Model relies on indirect measures to determine underinsurance- calculating groups reporting high medical expenses or with risks of high medical expenses- and correlating them with direct measures such as reports of deferral of care or delayed care due to cost.

The MDR model builds on the Commonwealth Fund model by adding in other measures indicating financial burden due to the cost of health care; the deferral of care due to costs and difficulty paying medical expenses.

Reported deferral of care due to cost is not captured by the Commonwealth Fund model. As neither an accountable expense, or an economically measurable risk of a future cost, the Commonwealth Fund model has no ability to account for individuals reporting experiencing the event that the model attempts to understand the risk of if the individual does not otherwise meet the criteria. Clearly, if care is not received due to cost then, from an economic perspective, the household's coverage is inadequate.

The Commonwealth Fund model does not ignore the deferral of care but rather considers the deferral of care due to cost as a correlate rather than causal factor.

There is an additional way in which the MDR model broadens the understanding of the underinsured. Underinsurance should be evaluated at the family rather than the individual level. Simply, if one member of the family is underinsured, we would consider all members of the same health insurance unit (most typically a family, which is the term we use throughout) to be underinsured as well. While health care expenses are incurred by an individual it is the family's income that covers these expenses. Thus, the entire family experiences the economic impact of the health care coverage of each of its members. The cost of health care for each individual is an expense that is borne by the entire family. It is not possible for expenses to be isolated to an individual, nor are health insurance policies constructed in order to segment expenses. An individual's health care expenses also cause economic hardship for the entire family. Money spent on care for an ill family member is money that cannot be spent for other household expenses. Like income, expenses and the hardships caused by those expenses are shared. Finally, the expenses of one or more members of the family may lead to other members of the family deferring care because of the family's medical expenses.

Underinsurance must also consider all health care expenses regardless of whether a health care plan provides coverage for a specific expense. A key example is expenses incurred for dental care, which are rarely covered under health care plans and for which people often need to purchase separate coverage. These expenses again come from the common pool of resources dedicated to health care. A lack of coverage in for one or more aspects of health care can lead to directing resources to pay for these health care services at the expense of others. That the health care market is segmented in order to direct the cost of dental care toward individuals rather than to shared insurance pools does not exclude it from being health care, nor does it mitigate the cost.

The MDR model uses the Commonwealth Fund model as a baseline as it includes the key elements of costs incurred and potential risk. We then expand the definition of underinsurance to include:

- Families that experience financial stress in paying for health care
- Families that have members deferring care due to cost
- Expanding the definition of underinsurance to the entire family. That is, if one family member would be identified as underinsured based on these criteria, we consider all members of the family underinsured.

Using the MDR model, a family is considered underinsured if:

- The private insurance deductible for a household member exceeds five percent of family income.
- Out of pocket health care expenses for the family exceed five percent of family income for those with incomes up to 200% of Federal Poverty Level or have health care expenses greater than 10 percent of family income for families earning more than 200% of Federal Poverty Level (excluding premiums for health insurance).
- One or more family members deferred health care due to its cost. This includes deferring:
 - Medical care from a doctor or surgery
 - Routine medical care that that was needed
 - Mental health care or counseling
 - Any type of dental care
 - A diagnostic test such as a CAT scan, MRI, lab work, or x-ray that was recommended
 - Specialist care
 - Prescription Medicines
 - Skipping doses or taking smaller amounts of prescription drugs to make them last longer
- If the family experienced difficulties paying for medical bills

Appendix 4: Weekly Report Template

Project: 2017 Oregon Health Insurance Survey

Sponsor: Oregon Health Authority

Weekly Data Collection Update

Data Collection Week of _____

Completed Surveys:

	Weekly Completes	Cumulative Completes
Total		
Landline		
Cell		
Spanish		

Dispositions and Response Rates:

See spreadsheet for dispositions.

All rates are preliminary and cumulative for data collection to this point.

	Cellphone Sample	Landline Sample
Response Rate		
Cooperation Rate		
Refusal Rate		

Resident Characteristics and Insurance Status

See spreadsheet for all details on respondents to this point.

Average Interview Length

Cellphone:

Landline:

Tasks Completed

Problems Experienced and Proposed Solutions

Upcoming Tasks (MDR)

Upcoming Tasks (OHA)

Appendix 5: Recommendations for Future Administrations

Identify a sample source to more effectively identify African American households.

The target set in the sampling plan was to survey 300 African American majority households.

Given their low percentage in the Oregon population (2.7%), the sampling plan included the use of a targeted over sample. An over sample targeting African American households was obtained through Marketing Systems Group and included both landline and cell phone numbers; a total of 11,400 records.

Achieving this goal proved to be difficult; only 186 African American majority household ended up completing the survey. The main limitations were the limited number of sample records available and the efficacy of this sample. While a total of 873 surveys were completed using this sample, only 4.9% were in African American majority households.

Prior to the 2019 survey administration, MDR will work with Marketing System Group to attempt to identify another sample source for identifying African American households in Oregon.

The use of texting to inform respondents about the survey

One of the biggest challenges of conducting surveys on cell phones is to get the respondent to answer the phone. More often, people are simply ignoring calls sent from numbers they do not recognize. While numbers from familiar area codes or with innocuous sounding caller IDs can be created, not all service carriers display this information. At the same time, texting is becoming the most prevalent mode of communication between those with cell phones. A text message may provide an easy means of communicating with respondents to inform them about the survey and the importance of their participation.

We recommend studying the feasibility of the use of texting. If feasible, MDR would use a service to send a brief text message informing the respondent about the survey and allow the recipient of the text to:

- Call in to complete the survey
- Call or text to schedule an appointment
- Text to indicate they would prefer not to participate.

The main concern to address is the legality of sending text messages; one cannot automate sending text messages to those without prior permission. However, the law is unclear about the legality if the text is sent by a person. It is hoped that the FCC will clarify rules regarding text messages sent to those who have not given prior permission if it is done for research purposes. MDR will continue to track legislation and rulemaking to determine if the FCC has provided clearer guidance.

Review and revise survey introductions, persuader statements, and information screens

The current lead in statement, persuader statements, and information screens introduce the survey to respondents, indicate its purpose, and provide information about how the respondent was selected. These front-end components also stress the importance of the respondent's participation to their community. This is a typical approach that uses the social good of the survey as a means to persuade respondents to participate. Given the decline in survey response and cooperation, this type of persuasion is becoming less effective.

We would suggest reviewing all of the front-end language about the goals of the survey and its importance and tailor these to include information on how participation will not only benefit the community as a whole but how their participation in the survey will benefit the respondent's household directly. We propose working with OHA to identify how survey participation may directly benefit the household and incorporate language stressing these benefits into the survey lead-in and persuader statements.

Inform the public about the survey prior to and during 2019 data collection

One possible method to increase interest in the survey is to inform the public about the survey, why it is important for Oregon, and why it is important for those contacted to participate. A media campaign could provide information through the OHA website, through social media, and through the traditional media. MDR can work with OHA to develop messaging that can be used to inform residents.

Review cases where inconsistent information was provided to multiple survey questions.

The OR HIS is a complex survey instrument that asks respondents to provide detailed information about insurance status, health care use and access, and other topics. In a small percentage of cases, respondents provided inconsistent or contradictory information. Examples included:

- Respondents indicating they did not have a gap of coverage during the past 12 months but did have a change in their health plan. They would then indicate there was actually a gap in their coverage.
- Respondents indicating they or another family member had visited a medical specialist or mental health care provider. When asked about how this care was coordinated with their primary care physician would then indicate no such visit occurred.
- Respondents indicating they or another family member had to find a new provider due to a change in their health plan. However, in prior questions they indicated no change in the health plan.

To avoid potential inconsistencies, we would propose modifying the survey to either prevent an inconsistency or, if one arises, to verify the information.

- An example of survey design to prevent inconsistencies:
 - If the respondent does not indicate a change in the health plan, do not allow a response to the later question that asks if they had to change providers due to a change in their health plan (as well as not allowing a response for those without insurance for more than 12 months)
- An example of survey design to verify information:

- Verify visits to a mental health care provider in cases where in response to question about the coordination or care between the mental health care provide and their PCP they indicate no visit to a mental health care provider.

MDR will revise the survey, identify questions where inconsistency might arise, and propose a change to prevent the inconsistency.

Review all survey questions to determine if there are questions that are not providing valuable information or are not getting the desired information

Once OHA has had an opportunity to review the data, we would propose a discussion to review the survey content to determine if there are questions that are not providing valuable information. Any such questions could either be modified to provide more useful information or eliminated if unlikely to ever provide information of value to OHA.

One sequence that we believe will need modification is the question series used to identify disabilities:

- Does a physical, mental, or emotional condition limit the activities of anyone in your household in ANY WAY?
- IF YES ASK: What is the disability, handicap, or chronic disease that limits PERSON?

Overall, 16.6% indicated some type of limitation but when answering the specific follow-up there was no consistency in the type of answer; respondents often did not provide sufficient information, others would mention a specific medical condition such as a chronic condition, or simply mentioned the type of limitation (i.e. I can't go upstairs). Many of the chronic conditions respondents would respond with are not generally considered 'disabling' (such as diabetes or hypertension) while others could be disabling but only at certain high levels of severity.

Look at ways to reduce survey length

Currently, the survey took nearly 30 minutes on average to administer. We would recommend that we look to reduce the survey length to an average of 25 minutes, if possible.

Plan ahead for changes in data collection; there will likely need to be an increase in the percentage of surveys completed by cell phone.

Given the continuing trend of households dropping landlines, we anticipate that during the next survey administration that the percentage of calls completed by cell phone will have to be increased to at least 75%.

Examine strategy to better achieve targets for percentage of respondents age 65+

While we used both pre-screening of the sample and screening during call attempts to remove household with respondents age 65 and older, the percentage of older residents in the data was still above the percentage in the actual population. Based on this experience during the 2017 OR HIS, we would propose the following to help bring the survey percentage more in line with the actual population percentage:

- Pre-screen the sample to identify household where the respondent is age 65 and older (Marketing Systems Group can append age information to virtually every landline record and a small percentage of cell phone records); we would recommend removing all records with an identified respondent 65 and older.
- During calling, we propose to continue screening to identify households that only have residents 65 and older but increasing the number of screen-outs right from the beginning of data collection. For landlines we would propose screening out 100% of household in which all residents are 65 and older and 75% of such households contacted by cell phone.

Appendix 6: Separate Documents for the 2017 Oregon Health Insurance Survey

These documents are provided separately

- OHA Oregon Health Insurance Survey 2017 Sampling Plan
- OHA Oregon Health Insurance Survey 2017 Analytical Plan
- 2017 ORHIS Weekly Summary Report for 8/30/2017 (MS Word document)
- 2017 ORHIS Weekly Report for 8/30/2017 (MS Excel document)
- 2017 ORHIS Survey Specifications

Survey instruments provided separately:

- Final 2017 OR HIS - Short Version
- Final 2017 OR HIS Survey English Version
- Final 2017 OR HIS Survey English and Spanish Version