

**Understanding Consumer Experiences and Insurance Outcomes Following Plan
Disenrollment in the Non-Group Insurance Market**

Appendix

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Detailed description of sampling and non-response weights

All analyses were weighted to account for elements of our sampling design and for non-response to the baseline and follow-up surveys.

Because respondents were sampled equally from state-enrollment source strata (except for enrollees off-Marketplace in Maine, where fewer enrollees were available), some respondents had a higher probability of being included in the sample than others. Sample weights were created to adjust our sample back to the population (all individual-market subscribers in one carrier in Massachusetts, New Hampshire, and Maine). To create weights for non-response to the baseline survey, we used administrative data to model the likelihood of response (vs. non-response) to calculate inverse probability weights. We followed steps as suggested in Seaman & White (2013)⁵ which entails using forward selection based upon AIC to add predictors, including interaction terms, to identify a non-response model. Model fit for the non-response model was tested using Hosmer-Lemeshow and Le Cassie-van Houwelingen methods⁶, which did not detect evidence of poor model fit, and weights were examined for extreme values, of which none were discovered. The final baseline survey non-response model reflected Marketplace participation, state, sex, age, metal tier of subscriber health plan, percent of census block that is Hispanic, whether the enrollee chose a new plan in 2017, and several interaction terms.

We used a similar process to calculate weights for non-response to the follow-up survey, but added baseline survey data as well as administrative data to model the likelihood of response (vs. non-response) to the follow-up among baseline respondents to calculate inverse probability weights. The final follow-up survey non-response model reflected Marketplace participation, state, sex, nativity, rating of experience trying to choose a plan, percent of census block that is low socioeconomic status, and the interaction of state and Marketplace participation.

To create the final weights used in analyses of the follow-up survey, we multiplied the original weight from the baseline survey by the weight that reflects the likelihood of responding to the follow-up survey.

Appendix Table 1. Massachusetts, Maine, & New Hampshire Demographics, 2017

	Massachusetts	Maine	New Hampshire
Total Population	6,859,789	1,334,612	1,348,787
Under Age 65 Population	5,751,007	1,066,716	1,111,929
% Under Age 65	83.84%	79.93%	82.44%
Total Population Statistics			
Within Poverty	10.0%	12.0%	6.6%
Urban	92.0%	38.8%	59.3%
Health Insurance Coverage			
Employer	55%	49%	57%
Non-Group	5%	6%	6%
Medicaid	24%	18%	14%
Medicare	12%	17%	17%
Military	1%	2%	1%
Uninsured	3%	8%	6%
Medicaid Expansion State in 2017	Yes	No	Yes
Race/Ethnicity			
Hispanic or Latino (of any race)	11.8%	1.6%	3.8%
Not Hispanic or Latino	88.2%	98.4%	96.2%
White alone	71.5%	93.4%	90.3%
Black or African American alone	7.0%	1.2%	1.3%
Asian alone	6.6%	1.1%	2.7%
Other Race Alone	1.0%	0.8%	0.2%
Two or more races	2.1%	2.0%	1.7%

SOURCE State population and demographic data from the United States Census Bureau's Current Population Survey, and Health Insurance Status and Medicaid State Fact Sheets from the Henry J. Kaiser Family Foundation.

NOTES Within Poverty percentages are reported in two-year averages. Years 2017-2018 were reported together in the U.S. Census Bureau Current Population Survey. Medicaid Expansion Dates: Massachusetts (1/1/2014), New Hampshire (8/15/2014), Maine (1/10/2019). Other Race Alone includes: American Indian and Alaska Native alone, Native Hawaiian and Other Pacific Islander alone, and Some other race alone.

Appendix Table 2. Market and ACA Marketplace characteristics by state, 2017-18

	Massachusetts		Maine		New Hampshire	
	2017	2018	2017	2018	2017	2018
Total # Insurers	9	7	3	2	4	3
Individual Market Competition						
Herfindahl-Hirschman Index (HHI)	2,618	2,919	3,370	4,821	3,593	4,559
Market Share of Largest Insurer	41%	44%	40%	59%	46%	61%
# Insurers with > 5% Market Share	4	4	3	2	3	3
Marketplace Enrollment						
# Individuals Who Selected a Marketplace Plan	266,664	267,260	79,407	75,809	53,024	49,573
Average Lowest-Cost Premiums by Metal Tier ^a						
Gold	b	\$378		\$641	b	\$524
Silver	b	\$307		\$566	b	\$457
Bronze	b	\$252		\$379	b	\$391

SOURCE Insurer Participation on ACA Marketplaces data, Insurance Market Competitiveness data, and Health Insurance Marketplaces data from the Henry J. Kaiser Family Foundation.

NOTES

^a Premiums are monthly. Premiums were analyzed using the lowest-cost premium for each metal tier (bronze, silver, and gold) for a 40-year-old in each county and weighted by county plan selections.

^b The average lowest-cost premiums by metal tier data is reported for years 2018 and onward.

Appendix Table 3. Number and Metal Tier of Non-group market health plans, by state

	Massachusetts		Maine		New Hampshire	
	2017	2018	2017	2018	2017	2018
On- and Off-Exchange	107	203	109	66	32	15
Off-Exchange Only	1,641	266	143	28	30	20
On-Exchange Only	715	389	166	87	38	24
Total	2,463	858	418	181	100	59
	Massachusetts		Maine		New Hampshire	
	2017	2018	2017	2018	2017	2018
Bronze	257	63	86	37	23	8
Silver	1,010	412	279	128	60	42
Gold/Platinum	1,151	352	36	12	14	7
Catastrophic	45	31	17	4	3	2
Total	2,463	858	418	181	100	59

SOURCE HIX Compare data from the Robert Wood Johnson Foundation.

NOTES The Robert Wood Johnson Foundation reports that it is difficult to obtain information about off-market plans which is largely from financial reporting of insurance carriers thus the quality of data on these plans is not as good. They nevertheless observe a very large nationwide decline in county-level offerings of off-exchange-only plans (from about 8,700 in 2017 to 4,000 in 2018). The percentage of counties without off-exchange plans grew from about 5 percent in 2017 to approximately 25 percent in 2018.

Appendix Table 4. Number and Metal Tier of Non-group market plans offered by Harvard Pilgrim Health Care by State, 2017-18

	Massachusetts		Maine		New Hampshire	
	2017	2018	2017	2018	2017	2018
On- and Off-Exchange	6	4	8	8	8	2
Off-Exchange Only	23	31	0	0	2	3
On-Exchange Only	0	0	12	12	9	3
Total	29	35	20	20	19	8
	Massachusetts		Maine		New Hampshire	
	2017	2018	2017	2018	2017	2018
Bronze	5	5	2	3	3	1
Silver	10	12	16	16	13	5
Gold/Platinum	14	18	2	1	3	2
Total	29	35	20	20	19	8

SOURCE Author's analysis of Harvard Pilgrim Health Care administrative data.

NOTES Harvard Pilgrim Health Care does not offer any plans in the Catastrophic coverage tier.

Appendix Table 5. Weighted sample characteristics and plan disenrollment, 2017-18

	Plan Disenrollment 2017-2018		Chi-Square P-Value
	Yes	No	
Enrollee on Plan with Chronic Condition			0.00
Yes	0.22	0.12	
No	0.49	0.17	
Age Group			0.01
<= 35	0.21	0.07	
36-45	0.12	0.04	
46-55	0.15	0.08	
56-65	0.23	0.11	
Male			0.75
Yes	0.34	0.14	
No	0.36	0.15	
Non-White			0.51
Yes	0.04	0.02	
No	0.66	0.27	
Income Level			0.03
<= 250% FPL	0.30	0.11	
251-400% FPL	0.16	0.05	
>= 400% FPL	0.26	0.12	
Family on Plan			0.57
Yes	0.26	0.10	
No	0.44	0.19	
In Same Plan from 2016-17			0.00
Yes	0.19	0.14	
No	0.52	0.16	
Education Level			0.91
HS Diploma or Less	0.12	0.05	
Some College	0.18	0.07	
4-Year College or More	0.41	0.17	
Health Insurance Literacy			0.97
Yes	0.16	0.07	
No	0.55	0.23	
State			0.00
Massachusetts	0.11	0.12	
Maine	0.33	0.11	
New Hampshire	0.27	0.06	
Enrollee on Plan in Fair/Poor Health			0.00
Yes	0.07	0.04	
No	0.64	0.25	
Metal Tier			0.00
Bronze	0.30	0.08	
Silver	0.33	0.13	
Gold/Platinum	0.08	0.08	
Narrow/Strict Network			0.00
Yes	0.21	0.05	
No	0.50	0.24	

SOURCE Authors' analysis of weighted survey data.

Appendix Table 6. Factors associated with plan disenrollment between 2017-18, regression results and Marginal Effects

	Coefficient	Standard Error	F-test pvalue	Marginal Effect	95% Confidence Interval
Enrollee on Plan has a Chronic Condition <i>(ref: No enrollee on plan with chronic condition)</i>	-0.33	0.15	0.03	-0.06	[-0.11, -0.004]
Significant benefit changes so plan became "new" plan <i>(ref: Plan renewed)</i>	1.21	0.23	<0.001	0.17	[0.12, 0.24]
Purchased Plan on ACA Exchange <i>(ref: Off-exchange)</i>	1.48	0.19	<0.001	0.27	[0.21, 0.33]
On-Exchange and "new" Plan	-0.18	0.32	0.55		
State			0.00		
Maine	0.82	0.21		0.15	[0.07, 0.22]
New Hampshire <i>(ref: Massachusetts)</i>	0.38	0.32		0.07	[-0.04, 0.19]
Age			0.01		
36-45	-0.17	0.27		-0.03	[-0.11, 0.05]
46-55	-0.68	0.23		-0.11	[-0.19, -0.04]
56-65 <i>(ref: <= 35)</i>	-0.64	0.21		-0.11	[-0.17, -0.04]
Income Level			0.40		
251-400% FPL	0.26	0.24		0.04	[-0.03, 0.12]
>= 400% FPL <i>(ref: <= 250% FPL)</i>	0.25	0.20		0.04	[-0.02, 0.11]
In Same Plan from 2016-17 <i>(ref: Not in same plan from 2016-17)</i>	-0.80	0.15	<0.001	-0.14	[-0.20, -0.09]
Metal Tier			0.01		
Silver	-0.45	0.19		-0.07	[-0.13, -0.01]
Gold/Plat <i>(ref: Bronze)</i>	-0.78	0.26		-0.14	[-0.23, -0.04]
Contract Premium Est. (2018)	0.001	0.00	<0.001	0.00	[0.00, 0.00]
Narrow/Strict Network <i>(ref: Broad network)</i>	0.50	0.34	0.14	0.08	[-0.02, 0.18]
Family Size (2017)			0.16		
2	-0.34	0.20		-0.06	[-0.12, 0.01]
3	-0.32	0.27		-0.05	[-0.14, 0.04]
4	-0.07	0.40		-0.01	[-0.14, 0.12]
5 <i>(ref: 1)</i>	-1.10	0.58		-0.20	[-0.45, 0.02]

SOURCE Authors' analysis of weighted survey data.

Appendix Table 7. Factors associated with plan disenrollment between 2017-18, analysis using self-reported health status

	Coefficient	Standard Error	P-Value
Enrollee on Plan in Fair/Poor Health <i>(ref: Enrollee on plan not in fair/poor health)</i>	-0.38	0.21	0.07
Significant benefit changes so plan became "new" plan <i>(ref: Plan renewed)</i>	1.26	0.23	0.00
Purchased Plan on ACA Exchange <i>(ref: Off-exchange)</i>	1.49	0.19	0.00
On-Exchange and "new" Plan	-0.25	0.31	0.43
State			
Maine	0.82	0.21	0.00
New Hampshire <i>(ref: Massachusetts)</i>	0.39	0.32	0.23
Age			
36-45	-0.20	0.27	0.46
46-55	-0.70	0.23	0.00
56-65 <i>(ref: <= 35)</i>	-0.68	0.21	0.00
Income Level			
251-400% FPL	0.26	0.24	0.28
>= 400% FPL <i>(ref: <= 250% FPL)</i>	0.20	0.20	0.32
In Same Plan from 2016-17 <i>(ref: Not in same plan from 2016-17)</i>	-0.81	0.15	0.00
Metal Tier			
Silver	-0.46	0.19	0.02
Gold/Plat <i>(ref: Bronze)</i>	-0.46	0.24	0.00
Contract Premium Est. (2018)	0.001	0.00	0.00
Narrow/Strict Network <i>(ref: Broad network)</i>	0.49	0.34	0.15
Family Size (2017)			
2	-0.32	0.20	0.10
3	-0.30	0.27	0.26
4	-0.02	0.40	0.97
5 <i>(ref: 1)</i>	-1.06	0.58	0.07

SOURCE Authors' analysis of weighted survey data.

Appendix Table 8. Plan Turnover and Negative Plan Experiences in 2017

	Had Experience, percent disenrolled	Did not have Experience, percent disenrolled
<i>Experience</i>		
Any Financial Burden	72.5%	67.7%
Can't see desired MD	71.6%	68.8%
Rated plan experience fair/poor	74.5%	68.0%
OOP costs higher than expected	71.7%	68.4%
Unexpected health event	71.8%	68.8%
New chronic condition in family	64.1%	70.5%

Source: Authors analysis of weighted survey data from follow-up survey, N=1,221

Notes: Unadjusted Cross-Tabulations, none of these comparisons are statistically significant (Pearson's chi-square test). Financial burden was measured as having trouble paying medical bills, difficulty paying for food, heat, or rent due to medical costs, or forgone care due to cost.

Appendix Table 9. Association of Disenrollment and 2018 Health Insurance Premium Level, multinomial logit regression results

Compared to respondents who indicated their 2018 premium was higher than their 2017 premium.

	2018 Premium is Same			2018 Premium is Lower		
	Coefficient	Standard Error	P-Value	Coefficient	Standard Error	P-Value
Disenrolled <i>(ref: Did not disenroll)</i>	1.49	0.42	0.00	3.24	0.43	0.00
Purchased Plan on ACA Exchange <i>(ref: Off-exchange)</i>	1.39	0.46	0.00	2.48	0.46	0.00
Disenrollment & On-Exchange	-1.19	0.55	0.03	-2.31	0.49	0.00
State						
New Hampshire	-0.47	0.28	0.09	-0.33	0.20	0.10
Massachusetts <i>(ref: Maine)</i>	0.31	0.34	0.35	0.41	0.27	0.13
Age						
36-45	0.17	0.44	0.70	0.53	0.32	0.10
46-55	-0.25	0.42	0.56	0.25	0.27	0.34
56-65 <i>(ref: <= 35)</i>	0.33	0.33	0.33	0.42	0.23	0.07
Enrollee on Plan with Chronic Condition <i>(ref: No enrollee on plan with chronic condition)</i>	-0.18	0.27	0.51	-0.28	0.19	0.13
Metal Tier						
Silver	0.36	0.29	0.21	-0.03	0.21	0.89
Gold/Plat <i>(ref: Bronze)</i>	-0.05	0.38	0.89	0.24	0.28	0.41
Income Level						
251-400% FPL	-0.39	0.38	0.30	-0.40	0.25	0.11
>= 400% FPL <i>(ref: <= 250% FPL)</i>	-0.63	0.32	0.05	-1.15	0.22	0.00
Family Size (2017)						
2	0.06	0.32	0.84	-0.04	0.22	0.85
3	0.33	0.44	0.45	0.16	0.33	0.64
4	-0.17	0.56	0.76	0.13	0.33	0.70
5 <i>(ref: 1)</i>	0.01	0.86	0.99	-0.31	0.65	0.63

SOURCE Authors' analysis of weighted survey data.

Appendix Table 10. Association of Reporting confidence in ability to afford 2018 health care with individual characteristics, logistic regression results

	Coefficient	Standard Error	P-Value
Disenrolled <i>(ref: Did not disenroll)</i>	-0.34	0.25	0.18
Purchased Plan on ACA Exchange <i>(ref: Off-exchange)</i>	-0.39	0.28	0.89
Disenrolled & On-Exchange	0.20	0.34	0.56
State			
New Hampshire	-0.36	0.18	0.05
Massachusetts <i>(ref: Maine)</i>	-0.99	0.24	0.00
Age			
36-45	0.62	0.26	0.02
46-55	0.42	0.24	0.08
56-65 <i>(ref: <= 35)</i>	-0.21	0.22	0.33
Enrollee on Plan with Chronic Condition <i>(ref: No enrollee on plan with chronic condition)</i>	-0.08	0.17	0.63
Metal Tier			
Silver	0.01	0.18	0.95
Gold/Plat <i>(ref: Bronze)</i>	-0.40	0.26	0.12
Income Level			
251-400% FPL	0.36	0.22	0.11
>= 400% FPL <i>(ref: <= 250% FPL)</i>	-0.06	0.21	0.78
Family Size (2017)			
2	0.02	0.20	0.91
3	-0.38	0.33	0.25
4	-0.21	0.29	0.47
5 <i>(ref: 1)</i>	0.18	0.48	0.71

SOURCE Authors' analysis of weighted survey data.

Appendix Table 11. Factors associated with plan disenrollment between 2017-18 (marginal effects) measuring plan generosity with OOP max and deductible level

	Marginal effect	p-value	Marginal effect	p-value
Enrollee or dependent has chronic condition <i>(ref. no chronic conditions)</i>	-0.056	0.035	-0.047	0.074
Purchased plan on Marketplace <i>(ref. purchased off-Marketplace)</i>	0.287	0.000	0.268	0.000
Plan was terminated <i>(ref. plan was available for 2018)</i>	0.174	0.000	0.165	0.000
Age				
36-45	-0.024	0.551	-0.026	0.503
46-55	-0.107	0.005	-0.116	0.002
56-65 <i>(ref. age 19 - 35)</i>	-0.096	0.005	-0.101	0.003
Household income				
251% - 400% FPL	0.022	0.584	0.013	0.752
400% FPL or higher <i>(ref. less than 250% FPL)</i>	0.026	0.432	0.022	0.510
Chose this plan in prior enrollment year ² <i>(ref. in different plan in prior year)</i>	-0.136	0.000	-0.140	0.000
OOP Maximum quartile				
second quartile	0.136	0.002		
third quartile	0.085	0.057		
fourth quartile (highest OOP max) <i>(ref. first quartile (lowest OOP max))</i>	0.140	0.001		
Deductible quartile			0.163	0.000
second quartile			0.146	0.000
third quartile			0.147	0.001
fourth quartile (highest deductible) <i>(ref. first quartile (lowest deductible))</i>				
Plan had narrow provider network <i>(ref. plan had broad network)</i>	0.137	0.008	0.099	0.001
State Fixed Effects	Yes		Yes	
N	1,548		1,548	

Source: Authors' analysis of weighted survey data

Notes: Results based on logistic regression models controlling for all variables listed in the table, an interaction between marketplace and non-renewal, family size, 2018 est premium and state of residence. In cross-tabulations we found no statistically significant difference in plan turnover by gender, race, whether purchased a family plan, health insurance literacy or education level

²survey respondents who indicated the plan they chose for 2017 was the same plan as they had in 2016 plan year.