

Appendix A. Mail Survey Characteristics

Variable	Values	Notes
<i>Information about the survey booklet</i>		
Survey version	0=MA-PD 1=MA-only	Some plans had both an MA-only and an MA-PD survey version; both versions were reviewed and coded.
Placement of instructions to beneficiary for completing the survey	0=on separate page 1=top of first page of survey	
Whether additional market names for the plan were displayed on the back of the survey	0=No 1=Yes	
Number of pages	Count	
Attractiveness (assessment of mail survey booklet for respondent friendly design based on use of color, visual cues to distinguish survey questions from response options, use of white space, and clear navigation cues)	4=most respondent friendly design 3=second most respondent friendly design 2=third most respondent friendly design 1=least respondent friendly design	Survey templates were arrayed and most and least respondent friendly designs were identified. Remaining templates were rank ordered in comparison to the most/least respondent friendly. Approach resulted in four numeric values for coding (1-4). All vendor mail survey booklets were reviewed and assigned to one of the four categories. See Appendix B for more detail.
Number of supplemental items	Minimum value is 0, Maximum value is 12 ¹	

¹ For Medicare-Medicaid Plans (MMPs), the maximum is 19 supplemental items.

Variable	Values	Notes
Supplemental items included one or more existing CAHPS items developed by the CAHPS consortium	0=No 1=Yes	
Supplemental items included one or more non-CAHPS items	0=No 1=Yes	
Any open-ended supplemental items (free response rather than choice of response options)	0=No 1=Yes	

Appendix B. Description of Respondent Friendly Survey Design and Coding of Attractiveness

The “attractiveness” variable provides an assessment of a given mail survey booklet for “respondent friendly design” based on the principles established by Dillman as influencing response rates and quality of data: use of color, presence of visual cues to distinguish survey questions from response options, presence and use of white space to help the respondent distinguish questions, and clear navigation cues.¹²

Survey templates were arrayed and most and least respondent friendly designs were identified, and the features of those templates were codified for use in coding the survey attractiveness variable. Vendors were required to use a minimum of 11-point font and no vendor used font larger than 12-point. In addition, all survey templates had similar page margins (side, top, bottom) due to use of scanning software for data entry and similar requirements for page margins across such software. As a result, font size and page margins were not factors in the development of our coding scheme for survey templates.

Features of the most respondent friendly design (Attractiveness = 1)

- Use of accent color
- Additional navigation cues to call out section headings
- More than one blank line between survey questions
- White space between survey question-response option block is larger than white space between a survey question and response options associated with the question
- One or more blank lines between end of survey question and start of response options
- A line or other demarcation between columns of survey questions
- Visible or extra white space on the survey page

Features of the least respondent friendly design (Attractiveness = 4)

- No use of color; black and white only
- No additional navigation cues to call out section headings

¹ Dillman, D. A., Sinclair, M. D., & Clark, J. R. (1993). Effects of questionnaire length, respondent-friendly design, and a difficult question on response rates for occupant-addressed census mail surveys. *Public Opinion Quarterly*, 57(3), 289-304.

² Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. John Wiley & Sons.

- No blank lines between survey questions
- No blank lines between end of survey question and start of response options
- No line or other demarcation between columns of survey questions
- No visible or extra white space on the survey page

After defining the anchors of the attractiveness scale, the remaining surveys were ordered based on the respondent friendliness of the survey template in comparison to the most/least respondent friendly templates. This approach resulted in four numeric values for coding (1-4). All vendor mail survey booklets were reviewed and assigned to one of the four categories.

Features of the second most respondent friendly design (Attractiveness = 2)

- May use accent color
- No additional navigation cues to call out section headings
- One blank line between survey questions
- White space between survey question-response option block is larger than white space between a survey question and response options associated with the question
- One-half to one blank line between end of survey question and start of response options
- A line or other demarcation between columns of survey questions
- Visible or extra white space on the survey page

Features of the third most respondent friendly design (Attractiveness = 3)

- No use of accent color
- No additional navigation cues to call out section headings
- One-half to one blank line between survey questions
- White space between survey question-response option block is equal to white space between a survey question and response options associated with the question
- One-half to one blank line between end of survey question and start of response options
- A line or other demarcation between columns of survey questions

Appendix C. Variation of Survey Characteristics by Vendor (# of Surveys)

	Vendor 1		Vendor 2		Vendor 3		Vendor 4		Vendor 5		Vendor 6		Total	
	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only
<i>Placement of Survey Instructions</i>														
On a separate page	30	0	16	0	172	64	91	24	116	34	2	2	427	124
Top of first page of the survey	0	8	0	0	0	0	0	0	0	0	0	0	0	8
<i>Survey Attractiveness</i>														
4 -- Most attractive	30	8	0	0	0	0	0	0	0	0	0	0	30	8
3	0	0	0	0	172	64	91	24	5	3	2	2	270	93
2	0	0	16	0	0	0	0	0	0	0	0	0	16	0
1 -- Least attractive	0	0	0	0	0	0	0	0	111	31	0	0	111	31
<i>Any CAHPS Supplemental Survey Items</i>														
Yes	26	7	6	0	51	13	45	12	49	15	0	0	177	47
No	1	0	1	0	0	0	37	7	5	0	0	0	44	7

	Vendor 1		Vendor 2		Vendor 3		Vendor 4		Vendor 5		Vendor 6		Total	
	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only	MA-PD	MA- Only
Not applicable	3	1	9	0	121	51	9	5	62	19	2	2	206	78
<i>Any Non-CAHPS Supplemental Survey Items</i>														
Yes	22	7	4	0	43	12	74	18	37	13	0	0	180	50
No	5	0	3	0	8	1	8	1	17	2	0	0	41	4
Not applicable	3	1	9	0	121	51	9	5	62	19	2	2	206	78
<i>Any Open-Ended Supplemental Survey Items</i>														
Yes	0	0	0	0	1	0	50	17	25	11	0	0	76	28
No	27	7	7	0	50	13	32	2	29	4	0	0	145	26
Not applicable	3	1	9	0	121	51	9	5	62	19	2	2	206	78
<i>Additional Market Names on Back of Survey</i>														
Yes	0	0	0	0	0	0	1	1	73	28	2	2	76	31
No	30	8	16	0	172	64	90	23	43	6	0	0	351	101

Appendix D. Beneficiary and Survey Characteristics at the Beneficiary Level

	N	%
Beneficiary characteristics		
Age		
18-34	6,975	1.4
35-44	11,655	2.4
45-54	23,122	4.7
55-64	49,278	10.1
65-69	96,197	19.7
70-74	113,348	23.2
75-79	79,475	16.3
80-84	52,484	10.7
85-89	33,777	6.9
90+	22,577	4.6
Race/ethnicity		
White	349,770	71.5
Black	72,577	14.9
Asian	18,891	3.9
Hispanic	26,868	5.5
Other	20,782	4.3
Male	207,030	42.4
Dually eligible/receive Low-Income Subsidy	187,190	38.3
Beale Code		
1 (most urban; county in metro area of 1 million population or more)	266,126	54.4

2 (county in metro area of 250,000 to 1 million population)	125,525	25.7
3 (county in metro area of fewer than 250,000 population)	40,744	8.3
4 (county with urban population of 20,000 or more, adjacent to a metro area)	20,340	4.2
5-9 (most rural)	36,153	7.4
	Mean (Standard Deviation)	Range
Survey characteristics (at the beneficiary level)		
Plan's 2010 response rate (%)	62.4 (10.1)	25.8 – 81.6
Page count	8.3 (1.1)	7 - 12
Number of supplemental items	4.1 (5.2)	0 - 19
	N	%
Missing 2010 response rate	197,970	40.5
Instructions at top of first page of survey (as opposed to a separate page)	765	0.2
Attractiveness		
1 (least attractive/easy to read)	136,354	27.9
2	13,994	2.9
3	313,792	64.2
4 (most attractive/easy to read)	24,748	5.1
Any supplemental items	250,274	51.2
Characteristics of supplemental items		
Any CAHPS	202,447	41.4

Any non-CAHPS	205,240	42.0
Any open-ended	83,296	17.0
Back of survey lists one or more additional names for the plan	95,572	19.6
MA-Only survey	21,011	4.3
Vendor		
1	24,748	5.1
2	13,994	2.9
3	206,889	42.3
4	100,754	20.6
5	140,314	28.7
6	2,189	0.5

Appendix E. Complete Results from Multivariate Model Predicting 2017 Survey Response from Plan-Level Survey

Characteristics (488,888 Beneficiaries Sampled from 438 MA Plans)

	OR (95% CI)	p-value	sig
Plan's 2010 response rate, per 10 percentage points	1.11 (1.08, 1.15)	<.0001	***
Missing 2010 response rate	0.99 (0.95, 1.04)	0.7305	
Instructions at top of first page of survey (as opposed to a separate page)	0.67 (0.56, 0.79)	<.0001	***
Attractiveness (1=least attractive/easy to read to 4=most attractive/easy to read)	1.32 (1.15, 1.52)	<.0001	***
Page count (recoded such that 0=modal value within survey type [8 for MA-PD, 7 for MA-Only])	0.91 (0.86, 0.95)	<.0001	***
Number of supplemental items	0.98 (0.97, 0.99)	0.0004	***
Any supplemental items	0.87 (0.78, 0.98)	0.0268	*
Characteristics of supplemental items	p=0.0002 for omnibus test		
Any CAHPS	1.13 (1.01, 1.26)	0.0354	*
Any non-CAHPS	1.15 (1.05, 1.26)	0.0026	**
Any open-ended	1.08 (1.00, 1.17)	0.0579	

Back of survey lists one or more additional names for the plan	0.93 (0.86, 1.00)	0.0482	*
MA-Only survey	1.10 (1.06, 1.15)	<.0001	***
Vendor			
1	1.09 (0.95, 1.27)	0.2216	
2	1.27 (1.06, 1.53)	0.0104	*
3 (omitted reference group)	1.00		
4	0.90 (0.83, 0.97)	0.0055	**
5	1.71 (1.35, 2.19)	<.0001	***
6	1.15 (0.87, 1.51)	0.3213	
Beneficiary characteristics			
Age			
18-34	0.41 (0.39, 0.44)	<.0001	***
35-44	0.47 (0.45, 0.49)	<.0001	***
45-54	0.62 (0.60, 0.64)	<.0001	***

55-64	0.86 (0.84, 0.88)	<.0001	***
65-69 (omitted reference group)	1.00		
70-74	1.11 (1.09, 1.13)	<.0001	***
75-79	1.24 (1.21, 1.26)	<.0001	***
80-84	1.28 (1.25, 1.30)	<.0001	***
85-89	1.17 (1.14, 1.20)	<.0001	***
90+	0.86 (0.84, 0.89)	<.0001	***
Race/ethnicity			
White (omitted reference group)	1.00		
Black	0.87 (0.86, 0.89)	<.0001	***
Asian	0.60 (0.58, 0.62)	<.0001	***
Hispanic	0.80 (0.78, 0.83)	<.0001	***
Other	0.81 (0.79, 0.84)	<.0001	***
Male	0.94 (0.93, 0.95)	<.0001	***

Dually eligible/receive Low-Income Subsidy	1.03 (1.01, 1.05)	0.0003	***
Beale Code (1=most urban, 5=most rural; values of 5 or greater coded as 5)	1.06 (1.05, 1.06)	<.0001	***

Model includes random effects for plans.

*p<0.05, **p<0.01, ***p<0.001

Appendix F. Complete Results from Multivariate Model Predicting 2017 Survey Response, with Interactions of Beneficiary Age and Plan-Level Survey Characteristics (488,888 Beneficiaries Sampled from 438 MA Plans)

	OR	p-value	sig
Plan's 2010 response rate, per 10 percentage points	1.09 (1.06, 1.12)	<.0001	***
Missing 2010 response rate	1.01 (0.96, 1.05)	0.8252	
Instructions at top of first page of survey (as opposed to a separate page)	0.68 (0.57, 0.80)	<.0001	***
Attractiveness (1=least attractive/easy to read to 4=most attractive/easy to read)	1.17 (1.01, 1.35)	0.0312	*
Page count (recoded such that 0=modal value within survey type [8 for MA-PD, 7 for MA-Only])	0.93 (0.88, 0.99)	0.0298	*
Number of supplemental items	1.00 (0.99, 1.02)	0.4887	
Any supplemental items	0.87 (0.77, 0.98)	0.0225	*
Characteristics of supplemental items	p<.0001 for omnibus test		
Any CAHPS	1.14 (1.02, 1.27)	0.0228	*
Any non-CAHPS	1.15 (1.05, 1.27)	0.0027	**
Any open-ended	1.09 (1.00, 1.18)	0.0405	*
Back of survey lists one or more additional names for the plan	0.95 (0.88, 1.03)	0.2229	
MA-Only survey	1.16 (1.12, 1.21)	<.0001	***
Vendor			
1	1.07 (0.92, 1.24)	0.3606	
2	1.29 (1.07, 1.55)	0.0067	**
3 (omitted reference group)	1.00		

4	0.90 (0.84, 0.97)	0.0089	**
5	1.73 (1.35, 2.20)	<.0001	***
6	1.13 (0.86, 1.49)	0.3814	
Beneficiary age			
18-34	0.46 (0.42, 0.49)	<.0001	***
35-44	0.51 (0.48, 0.55)	<.0001	***
45-54	0.66 (0.64, 0.69)	<.0001	***
55-64	0.89 (0.86, 0.91)	<.0001	***
65-69 (reference group)	1.00		
70-74	1.05 (1.03, 1.08)	<.0001	***
75-79	1.12 (1.08, 1.16)	<.0001	***
80-84	1.11 (1.06, 1.16)	<.0001	***
85-89	0.97 (0.92, 1.03)	0.3614	
90+	0.69 (0.64, 0.74)	<.0001	***
Linear age category x survey characteristics			
Joint test for all interactions (3 degrees of freedom)		<.0001	***
Age x attractiveness	1.02 (1.02, 1.03)	<.0001	***
Age x page count	0.99 (0.99, 1.00)	0.0230	*
Age x number of supplemental items	1.00 (1.00, 1.00)	<.0001	***
Other beneficiary characteristics			
Race/ethnicity			
White (omitted reference group)	1.00		
Black	0.87 (0.86, 0.89)	<.0001	***
Asian	0.60 (0.58, 0.62)	<.0001	***
Hispanic	0.80 (0.78, 0.83)	<.0001	***
Other	0.82 (0.80, 0.85)	<.0001	***

Male	0.93 (0.92, 0.95)	<.0001	***
Dually eligible/receive Low-Income Subsidy	1.04 (1.02, 1.06)	<.0001	***
Beale Code (1=most urban, 5=most rural; values of 5 or greater coded as 5)	1.06 (1.05, 1.06)	<.0001	***

Model includes random effects for plans.

*p<0.05, **p<0.01, ***p<0.001